Health Education

Rural–urban drift: labour migration, health-seeking behaviour disparity in the urban slum of Madina, Ghana

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Abstract

Purpose – The health challenges that characterise most of the migrants' urban slums raises a lot of concern for their well-being. Health-seeking behaviour becomes an important step towards maintaining a healthy life. The importance of contextual issues is necessary to help meet specific community health needs and programmes. Therefore, this study aims to bridge the knowledge gap by investigating health-seeking behaviour disparity among rural–urban labour migrant's slum dwellers before and after migration to the urban slums of Madina in the Greater Accra Region, Ghana.

Design/methodology/approach – The author used explanatory sequential approach of research investigation. Questionnaire and interview guides were used to collect data from the respondents however, in the absence of an existing reliable sampling frame, the various communities were selected by the use of cluster sampling proportional to size. At the second stage, a simple random sampling was used to select the various household heads. A total of 241 questionnaires were retrieved from the respondents representing a response rate of 100%. The author used purposive sampling technique to conduct eight in-depth interviews and six key informants' interviews.

Findings – The author found various discrepancies in many of the activities that could fulfil substantial health-seeking behaviour in the slum as compared to migrant's places of origin. The reason for coming to the slum amidst many settlements needs and low education background are the factors that accounted for this. This study, therefore, contradicts the proposition held by the health belief model. It is, therefore, important to note that contextual issues are key, in this case, rural–urban migrant slums present a different dynamic that must be taken into account when designing health programmes for such settings.

Originality/value – Many, if not all the, studies on health-seeking behaviour have focused on urban slums without taking into account urban migrants' slums. Such a failure to take into account the variations of the health needs of migrants' urban slum settings can eventually lead to a mismatch of health programmes meant to address their challenges. Therefore, this study brings to the fore such variations that must be taken into account when designing health programmes. The study also indicates that even with the same people, there were disparities in terms of health-seeking behaviour in the slum and at places of origin.

Keywords Health-seeking behaviour, Rural–urban migration, Urban slums, Health belief model

Paper type Research paper

Introduction

Background of the study

Globally, about 54% of the world's population are urban residents, a billion of whom are estimated to be living in slums conditions (UN-HABITAT, 2016). According to the International Organisation for Migration (2015), sub-Saharan Africa is home to 61.7% of slum dwellers. In Ghana, as of 2001, the slum population was estimated to be around 4.5 million. This number has increased to 1.83% per annum and evidenced in key cities of the country. This figure reached 4.9 million in 2010 and 5.3 million in 2014 (UN-HABITAT, 2016).

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Like slums in other parts of the world, Ghana's urban slums serve as home to many internal and international migrants and are characterised by overcrowding, insanitary conditions, unsafe buildings, deprived access to basic facilities such as health services, sanitation and clean water (Owusu *et al.*, 2008). Though urbanisation is occurring at a rapid pace, Ghana's housing deficit currently stands at 1.7 million units and a minimum of 170,000 housing units will have to be built annually to salvage the situation (Daily Graphic Online, 2014). This phenomenon is mainly as a result of rural–urban migration. The motive behind the large movement from the rural–urban areas is because of the better living conditions and the relative improvement of different facilities in the urban areas compared to the rural areas (Habtamu, 2015). Rural–urban migration involves the movement of people from the rural areas into the cities, often the metropolitan cities of a country. This change of residence is often connected with the migration of labour and a career change from primary to second or third sector – not necessarily, though, as it can refer to the migration of people who are not working in agriculture or farming as well (Todaro, 1976).

Rural–urban migration is, therefore, a critical component of urbanisation (Tacoli *et al.*, 2015). One of the major challenges faced by countries that are undergoing rapid urbanisation is the spread of diseases (Vlahov *et al.*, 2006) and the emergence of slums and other informal settlements, which are common phenomenon in most cities of developing countries. This occurrence is largely attributed to rural–urban migration (Davis, 2004). In Ghana, slums have developed and grown in many different parts of the country over the years. In the Greater Accra Region of Ghana alone, a report by the Population Division of the United Nations Department for Economic and Social Affairs (2009) indicates that nearly one-third of the population are slum dwellers. According to Afrane (2010), one of the migrant communities in Ghana popularly referred to as "Zongo" and newly emerging squatter communities largely contribute to the rapid expansion of slums. Old Fadama and Nima, among others, are some of the examples of slums communities in Accra. Other rapidly growing slums such as Madina are also found in low-income suburbs of the region (Ghana Statistical Service, 2010). A major problem often faced by these slum communities is the episode of diseases due to the poor living conditions, which raises a major concern. This is because in most circumstances, slum dwellers find themselves in a vicious cycle of economic and psychological poverty. The extremely excruciating situation they find themselves in makes it difficult for them to afford many essentials of life; they experience grave deprivation pushing them into a state of despondency (Sheuya, 2008; UN-HABITAT, 2003). The poor housing situation coupled with the dirt and squalor and lack of financial resources contribute to the presence and spread of varied infectious diseases in slums, affecting women and children mainly (Sheuya, 2008; Sverdlik, 2011; UN-HABITAT, 2003; WHO, 2005; Zulu *et al.*, 2011). Also, the high cases of maternal mortality, high vulnerability to HIV infection, high unmet need for family planning and developmental challenges in children and adolescents are just a few of the many negative results of poor access to health in city slums (Halder *et al.*, 2009; Matthews *et al.*, 2010; Zulu *et al.*, 2011). Besides, these sub-populations are also exposed to unhealthy lifestyle factors such as physical inactivity, obesity, harmful diets, alcohol and tobacco use due to high unemployment rates and poverty (Rahman *et al.*, 2011). Attempts at addressing some of these challenges in Ghana and the world have led to the introduction of some targets and policies, prominent among them being target 11 of the Millennium Development Goals (MDGs), which aim at improving the lives of at least 100 million slum dwellers world wide by 2020 (UN-HABITAT, 2006a). The Sustainable Development Goal (SDG) three, which seeks to improve health remains a global priority during 2016–2030, this is to focus on ensuring healthy lives and promoting well-being for all at all ages (WHO, 2016).

The MDG's and SDG's are both expected to bring improved health outcomes of rural–urban slum dwellers as well. This makes it necessary that health-care policies are formulated in a way that brings about positive health outcomes for such underprivileged populations.

Health-seeking behaviour in their communities becomes an important step towards finding cure for any disease among any population (Prince and Hawkins, 2007). According to Ahmed *et al.* (2000), health-seeking behaviour refers to any activity carried out by individuals who perceive themselves to have a health problem or ill for the purpose of finding appropriate remedies. It is more or less the summation of the characteristics of the individual, the environmental conditions in which the person lives and the interaction that goes on between the individual and environment. It also takes into consideration issues of whether, when and from where care is obtained for an illness (Chomi *et al.*, 2014).

There is, therefore, health differences in terms of rural settings and the urban slum settlements with regards to how such groups engage in health-seeking behaviour. Knowledge about health-seeking behaviour among these populations is, therefore, essential to provide need-based health outcome. However, this is often ignored, and even where this knowledge exists, there is often a mismatch between specific community needs and programme priority due to context environment variations which render programmes unproductive (Singh *et al.*, 2014). According to Maneze (2014), most migrants who have moved to new locations may consider health-seeking behaviour a lesser priority because they have many settlement issues and also seek for better economic opportunities, and because of this, they rather adopt various coping mechanisms to overcome their health challenges. As a result, health promotion interventions fail to get the desired acceptance of the community. These issues make health-seeking behaviour practices very complex and therefore need contextual exploration (Singh *et al.*, 2014). Although, a considerable number of studies have been conducted on health-seeking behaviour of slum dwellers. Studies on the contextual exploration of rural–urban migrant slum settlements are relatively few (Zulu *et al.*, 2011). Therefore, using a mixed-methods approach, this study seeks to bridge the knowledge gap by investigating the health-seeking behaviour disparity of rural–urban labour migrants slum dwellers before and after migration in the urban slums of Madina in the Greater Accra Region, Ghana. Specifically, the study sought to examine the health-seeking behaviour among the rural–urban migrant slum dwellers before and after migration, the challenges associated with the health-seeking behaviour before and after migration. The study contributes to the limited research works on migration and health, especially in the Ghanaian and African context. The study provides insight into the contextual issues regarding rural–urban migrant slum dwellers' health-seeking behaviour patterns, which is relevant for health planners and other relevant stakeholders in Ghana and other developing countries.

Theoretical perspective

Literature reviewed indicates that a number of models can be used for understanding the health-seeking behaviour. For the purpose of this study, the health belief model (HBM), which is health-specific behavioural cognitive model (Orji *et al.*, 2012; Taylor *et al.*, 2006), was adopted and modified to help understand health-seeking behaviour for different types of diseases and how interventions by planners and other support agencies can be achieved among rural–urban migrant slum settings, as in the case of Madina in the Greater Accra Region. The model is a psychological model that attempts to explain and predict health behaviours by focusing on the attitudes and beliefs of individuals. HBM was first proposed by Hochbaum, Rosenstock and Kegels in the US public health services. HBM is, therefore, based on the idea that the behaviour of people or individuals are more likely to change and thereby adhere to treatments (Janz and Becker, 1984; Olsen 2008; Turner *et al.*, 2004). The health belief components, Figure 1, explain or predict why people will take action to prevent, to control or to screen for a disease. These components include if; (1) they perceive that they are at risk of contracting a disease (perceived susceptibility), (2) they perceive that the disease is likely to have an unfavourable outcome (perceived severity), (3) they perceive the proposed health behaviour to be effective and

practical (perceived benefit), (4) they perceive negatively valued aspects of taking the action or overcoming anticipated barriers to taking it (perceived barriers), (5) they perceive themselves to have the ability of applying and practicing the specific behaviour proposed (perceived self-efficacy) and finally, (6) they have the cues for motivating their actions such as internal cues (pain, symptoms and past experience) or external cues (being advice received from family and friends as well as media campaigns, etc.) (cues to action).

Methodology

Study setting

The study focuses on Madina, a suburb of Accra in the La -Nkwantanang Madina Municipality of the Greater Accra Region, Ghana which is one of the 16 metropolitan/municipal/district assemblies that have experienced an increasing number of rural–urban migration in the region. Madina covers a land area of 166 sq. km and boarded on the west by the Ga East Municipal Assembly (GEMA), on the east by the Adentan Municipal Assembly (AdMA), the South by the Accra Metropolitan Assembly (AMA) and the north by the Akwapim South District Assembly. The La- Nkwantanang Madina Municipality is one of the urban municipalities in the Greater Accra Region with rural settlements, which are also developing into peri-urban settlements. Madina, being the capital of the municipality, has over the years developed into the Central Business District of the Municipality, which has become a hub for major commercial activities. Due to this, Madina has also become a home for a growing number of rural–urban migrants (Ghana Statistical Service, 2010).

Madina used to be a fully functional zonal council of the GEMA until it was given a municipal status in 2012. All the previous metamorphoses of the area are largely as a result of urban creep in the fast-growing peri-urban areas, and the influx of migrants from many parts of the country and beyond led to the creation of La Nkwantanang Madina Municipal Assembly (composite budget of the municipality, 2016). The total population of the municipality stands at 111,926, of which 73,545 (representing 65.7%) are migrants. The high proportion of migrants could be attributed to the fact that the La-Nkwantanang Madina Municipality was a cosmopolitan municipality with various economic activities attracted migrants from all over the country in search of better economic prospects. Most of the houses in the municipality are owned by private individuals. There is lack of sufficient housing units in the municipality, coupled with the high cost of rent, which has contributed to the development of temporary structures and overcrowding in rooms. There is pressure on social amenities, streetism and conversion of commercial facilities for residential use. These developments have led to the growth of slums in some suburbs of the municipality. Females constitute a larger proportion of the population and are mostly self-employed. A higher proportion of males have access to formal education than their female counterparts in the

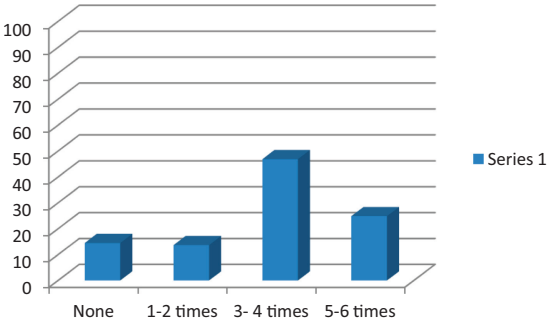

Figure 1.
Frequency of disease treatment in the slum community

municipality. Although the municipality has seen improvement in sanitation, some areas of Madina still lack adequate sanitation, and this has led to the outbreak of some diseases in the area (Ghana Statistical Service, 2010).

Research design

The study adopted an explanatory sequential approach of research investigation. This was done to provide a comprehensive analysis of the research problem (Creswell, 2003). This was to allow the initial quantitative data results to be explained further with the qualitative data. Thus, the study derived data from multiple sources, including primary and secondary data sources. The primary data sources included the use of questionnaires and in-depth interviews. While, the secondary sources of data collection included documentary such as books, journals, articles and other scholarly sites of the internet example jstor.org, database, Google advance search, this source also included the use of photographs and recordings. Therefore, relevant literature documenting the conceptual framework on the health-seeking behaviour among rural–urban migrant slum dwellers was employed for broader analyses.

Population, sampling size

Rural–urban slum dwellers residing in the poor urban communities in Madina were used for the study. An initial screening of rural–urban migrant slum household's heads or their representatives was conducted. In total, 253 respondents were identified to represent the total population of the respondents. Yamane's formula was used to determine the sample size of 241. The formula is stated below:

$$n = [N/1 + N(e)2]$$

Determination of sample size is based on the estimated population size ($n = 253$).

N – The sample size

N – The population size

e – The desired level of precision or level of acceptable error = 0.05)

$$\begin{aligned}\text{Total sample size}\,(n) &= [253/(1 + 253(0.05)2] = [253/(1 + 253\times 0025)] \\ &= [253/1 + 0.05] \\ &= [253/1.05] \\ &= 241\end{aligned}$$

Based on this, 241 respondents were used for the quantitative data. This is appropriate, looking at the homogeneity and the size of the communities under study. Hence, the views and opinions of the sampled respondents could be used to generalise the study. As far as this study is concerned, based on initial screening, some rural–urban migrant slum households' heads or their representatives were identified to represent a total population of 241 households. The indicator for selection was based on urban population lacking at least one of the following five housing conditions: access to improved water; access to improved sanitation facilities; sufficient living area, not overcrowded; structural quality/durability of dwellings; and security of tenure (UN Human Settlements Programme, 2010).

Sampling frame, sampling technique

However, in the absence of an existing reliable sampling frame, the various communities were selected by the use of cluster sampling proportional to size (Table 1). At the second stage, simple random sampling was used to select the various household heads. This was done by labelling code numbers to the households after which the labels were put into a box and shuffled. The labels were then picked randomly from the box to form the sample in a series of

draws. The aim was to ensure that each house hold head had equal chance of being selected (Brink, 1996).

To avoid any bias, the study participants were selected based on the set criteria below:

(1) Participant should have been an internal migrant residing in the slum communities.

(2) Participants should have resided in any of the slum communities for not less than six months.

(3) Participants should have demonstrated that he or she was willing to participate in the study.

(4) Participants should have been 18 years and above.

This means that the respondents who did not meet the above criteria were not allowed to participate in the study.

We used purposive sampling technique to select ten in-depth interviews (IDIs) and eight key informants' interviews (KIIs) made up of opinion leaders were also conducted. However, due to saturation or redundancy, a sample size of eight IDIs and six KIIs were used for the study. The English language served as the main mode of communication; however, the services of a translator were also engaged to help with translation. The various questions were based on health-seeking behaviour among the migrant slum dwellers before and after migration, challenges associated with health-seeking behaviour before and after migration, The aim was to offer the opportunity to capture rich, descriptive data and also to understand the thoughts, feelings and experiences of the migrants with regard to health-seeking behaviour of the migrants before and after they migrated into their present environment.

Pretesting

The instruments were pretested among rural–urban migrant slums at Dome in the GEMA with ten questionnaire and two interviews. The aim was to help the researcher reassess and restructure the questionnaires. It was also to help in revealing the length of time appropriate for questioning the respondent (Cohen *et al.*, 2002).

Ethical approval

We obtained ethical approval from the Ethics Committee for Humanities, University of Ghana, Legon, ethical clearance number ECH 031/17-18, and this is in line with national ethical clearance. After consent was granted, information about the research was read to the participants who were willing to take part in the study. The participants were assured of anonymity and confidentiality. Each participant was made to either sign or thumb print a consent form. For the purpose of ethical reasons, all names used in this study are pseudonyms.

Settlements	Total number	No. of respondents
1. Madina Market Area	75	71
2. Social welfare down area	46	44
3. Nkwantanang/Ritz Area	51	49
4. Redco Area	38	36
5. Zongo Area	43	41
Total	253	241

Table 1.
Sample size of the various communities

Data analysis

The statistical package for social science research (SPSS) software version 20 was used to analyse quantitative data. The data were coded before the analysis was made. Univariate and bivariate were used in the data analysis. In univariate analysis, descriptive and frequency statistics were used to determine the general characteristics of the study population. As with bivariate analysis, cross-tabulation was used to determine if there was a relationship between various variables at the 0.05 level, of which a conclusion was drawn. In terms of qualitative aspect, data were transcribed and translated for uploading on to NVivo software. The data were done by identifying themes and sub-themes.

Results

Socio-demographic and economic characteristics

The population was female dominated, 74.3%, while their male counterparts accounted for 25.7% (Table 2). Generally, the population tended to be young at the early age of reproductive life span with a mean age of 1.73. The highest age group sampled was the 18–25 age category, accounting for 53.1%. The least age group sampled was 58 years and above, accounting for 0.8%. With low education reported among most of the respondents, a little over half (59.8%) had no education at the time of the survey. About 22.0% of the respondents had middle/junior secondary school certificate. The least education sampled, primary and vocational/technical/senior secondary school and the ordinary-level certificates accounted for 9.1%, respectively. The majority of the respondents sampled had some kind of marital relationship in their lifetime. A little over half (58.9%) of the respondents were married, and about 35.3% had not

Variables	Number	%
Gender		
Male	62	25.7
Female	179	74.3
Total	241	100
Age		
18–25	128	53.1
26–33	66	27.4
34–41	34	14.1
42–49	11	4.6
50–57	–	–
58+	2	0.8
Total	241	100
Education		
No education	144	59.8
Primary	22	9.1
Middle/JSS	53	22.0
Voc/tech/SSS/O-level	22	9.1
Total	241	100
Marital status		
Never married	85	35.3
Married	142	58.9
Consensual union	4	1.7
Separated	6	2.5
Divorced	4	1.7
Total	241	100

Table 2. Summary of survey population by socio-demographic characteristics

had any marital relationship. Both consensual union and separated marriages accounted for 1.7%. The least sampled the divorcees accounted for 1.7%.

In an interview with a young man, his quest to emigrate was as a result of the need to come look for money and be able to cater for his family. Kofi, the 22-year-old electronic waste dealer said that "life in my village is difficult for me and my family so I came here to look for money and look after them".

Migration history

Nearly half of the respondents (45.2%) originated from Upper West Region of Ghana, with the Upper East being the next, accounting for 17.4%. The Northern Region accounted for 14.5%, with the least region being the Ashanti Region, which accounted for 3.7% (Table 3). Several reasons motivated the respondents to migrate to Accra. Among these are the search for better job opportunities and prospects (95.4%), and the need to further education (2.9%). The desire to learn a trade accounted for 1.7%. In an interview, it was revealed that:

> Over there, there are no jobs. Though I worked as a farmer, all the money I got from the farming business went to my husband, and I did not get a penny except food I get to eat. I therefore, decided to come here to work and save some money so I can buy a sewing machine for myself and go back and learn a trade [Asana, 29-year-old domestic worker].

More than half (63.1%) came to the city in the company of a relative. About 35.7% came with friends. The remaining 1.2% migrated to the city on their own.

Health-seeking behaviour among rural–urban migrant slum dwellers

More than half of the respondents (58.0%) maintained clean environment at their various places of origin, which was not reported in slum communities. However, long working hours

Variables	Number	%
Region of origin		
Ashanti	2	0.8
Brong Ahafo	14	5.6
Central	6	2.5
Eastern	12	5.0
Northern	35	14.5
Upper East	42	17.4
Upper West	109	45.2
Volta	12	5.0
Western	9	3.7
Total		
Reason for coming to Accra	241	100
Further education	7	2.9
Seek better job	230	95.4
Others	4	1.7
Total		
Person came with	241	100
Alone	3	1.2
Relative	152	63.1
Friend	86	35.7
Total	241	100

Table 3.
Survey population by migration history

(55.6%), which impede health-seeking behaviour, prevail in the slum than places of origin (Table 4).

Baba, a 25-year-old load off-loader said "we came here to look for nothing else than money so you cannot sit down and rest you have to work extra hard to get the money".

In a similar interview, one respondent stated that: *Unlike the situation in my hometown, people here do things anyhow. Besides, here in Madina, a person needs money to do virtually everything including disposing of refuse. People, therefore, dump their refuse indiscriminately to avoid paying* [Adjoa, 23 years].

Majority 78.0% consulted at a tender stage of the disease at places of origin as compared to after migration (68.0%). The delayed until serious stage of disease 8.7% was reported in the slum (Table 5).

Mustaph, a 25-year-old junior high-school leaver and driver believed that it was always easy seeking early treatment before he came to the slum community because back home, the national health insurance and support from family helped him access health care any time he fell sick. When compared to his stay in the slum, he intimated that, though it is difficult, you cannot also delay that much because it will eventually break you down and you cannot go and work, the reason why I came here.

In an interview, a respondent explained that:

Because I do not know if the sickness could get serious and, render me immobile. I always prefer seeking early treatment before my condition worsens. I used to do the same thing before I came here [Celina, 20-year-old young woman and domestic worker].

Nearly half of the respondents (46.9%) had treated diseases between three and four times, the least treatment times being 1–2 and accounting for 13.7% (4.6). It, therefore, came as no surprise when this came to light in an interaction with a respondent (Figure 1). According to her:

Activities	Before *N* (%)	After *N* (%)
Do not engage in risky lifestyle behaviours, e.g. smoking, alcohol use, etc.	53 (22.0)	0 (0.0)
Cleanliness of environment	140 (58.0)	0 (0.0)
Conscious effort to eat healthy diet	8 (3.3)	0 (0.0)
Getting adequate rest and sleep	13 (5.3)	2 (0.8)
Medicare benefits for timely accessibility of health-care services	15 (6.2)	3 (1.2)
Engagement in regular physical activity	10 (4.1)	102 (42.3)
Participate in health promotion programme	2 (0.8)	0 (0.0)
Over working with less rest	0.0	134 (55.6)
Total	241 (100)	241 (100)

Table 4. Health-seeking practices before and after migration

Stages	Before *N* (%)	After *N* (%)
Early stages and onset of symptoms mild	189 (78.4)	165 (68.0)
Time of disease and its symptoms	52 (21.6)	55 (22.8)
At serious stage of disease	–	21 (8.7)
Hospital/clinic emergency room	–	–
Total	241 (100)	241 (100)

Table 5. Stage of disease and seeing provider before and after migration

> While I was in my home town I hardly fell sick, I remember that once I had experienced stomach ache and that was all. Unfortunately, because of the poor sanitation here, there are too many mosquitoes so I fall sick almost every week. Again, the bed bugs in our room bite us in the night so I always have my skin itching me every now and then [Salamatu, a 25-year-old woman].

The findings from survey show that, though seeking treatment only in times of sickness was reported across all groups, the tendency was quiet higher among the married (92.0%) than in any other groups (Table 6). This was confirmed in an interview:

> Over here, I take care of two other children. My husband is not here and sometimes we find it difficult to buy food let alone medicine. However, by the Grace of God we always survive it [Adwoa, a 22-year-old nursing mother].

From the results indicated in Table 7, large proportion 91.4% have had relatives influence in their regular check-ups, about 89.5% were also influenced by friends.

Salima, a 20-year-old young woman, with no formal education and from Upper West Region who had miscarriage in her seventh month of pregnancy, narrated how her friends and some family members encouraged her to go for regular antenatal care, which she did not heed to until that unfortunate incident occurred.

The chi-square test reveals statistically no significant relationship between relatives, friends and influence on seeking regular checks by an individual ($\chi^2 = 2.224$, df = 2, $p = 0.329 > 0.05$).

The highest precaution sampled (77.3%) was reported among those with vocational, technical and O-level certificates. Middle/JSS certificates holders (68.2%) were also found to adhere to precautionary practices (Table 8). However, the chi-square test reveals statistically no significant relationship between education and precautionary measures against diseases among migrants slum dwellers ($\chi^2 = 3.126$,df = 3, $p = 0.373 > 0.05$).

An assessment to ascertain what informed migrant slum dwellers' decision to seek health-care treatment in the slum on Likert scale items is indicated in Table 9. The result shows that more than half, 59.0% ($M = 2.48$, SD = 1.11), would seek formal treatment only if self-medication fails. Those who would seek health care only if they have the money, 56.8% ($M = 2.48$, SD = 1.12). Little over half of the respondents, 51.5%, would seek care only when

Table 6.
Seeking treatment in times of sickness by marital status

	Marital status					
Response	Never Married *N* (%)	Married *N* (%)	Consensual Union *N* (%)	Separated *N* (%)	Divorced *N* (%)	Total *N* (%)
Yes	76 (89.4)	127 (92.0)	7 (87.5)	5 (83.3)	3 (75.0)	218 (90.5)
No	9 (10.6)	11 (8.0)	1 (12.5)	1 (16.7)	1 (25.0)	23 (9.5)
Total	85 (100)	138 (100)	8 (100)	6 (100)	4 (100)	241 (100)

Table 7.
Relatives/friends came with and their influence on regular checks

	Relative/friends			
Response	Alone *N* (100)	Relative *N* (%)	Friend *N* (%)	Total *N* (%)
Yes	2 (66.7)	139 (91.4)	77 (89.5)	218 (90.5)
No	1 (33.3)	13 (8.6)	9 (10.5)	23 (9.5)
Total	3 (100)	152 (100)	86 (100)	241 (100)

Note(s): ($\chi^2 = 2.224$, df = 2, $P = 0.329 > 0.05$)

they realised their sickness was getting worse ($M = 2.23$, SD = 1.17).The least sampled those who see the need to seek a formal care, 19.5% ($M = 3.27$, SD = 1.39).

Challenges with health-seeking behaviour

Majority (62.3)% tend to experience more challenges in their quest to health-seeking behaviour in the slum as compared to the period before migration (34.9%) (Table 10).

Among the challenges (Table 11), the cost of accessing health care was higher (60.2%) in the slum as compared to their places of origin (49.8%). The poor dirty environment in which respondents lived in their slum communities accounted for 18.3%. One of the respondents had this to say:

> It is difficult here but in my hometown, I did not experience these kinds of difficulties because my parents were always ready to support me both in kind and in cash, but here nobody is willing to help. Everybody does what pleases him or her [Fuseini, a 26-year-old man].

Table 8. Education and assessment of precaution among migrant

	Education				
Responses	No education *N* (%)	Primary *N* (%)	Middle/JSS *N* (%)	Voc/tech/ O'level *N* (%)	Total *N* (%)
Yes	85 (59.0)	32 (60.4)	15 (68.2)	17 (77.3)	149 (61.8)
No	59 (41.0)	21 (39.6)	7 (31.8)	5 (22.7)	92 (38.2)
Total	144 (100)	53 (100)	22 (100)	22 (100)	241 (100)

Note(s): ($\chi^2 = 3.126$, df = 3, $p = 0.373 > 0.05$)

Table 9. Assessment of migrant on the basis of what informed decision to seek care treatment (Likert scale based on a 1-5 scale: 1 representing "Strongly Agree", 2 "Agree", 3 "Neutral", 4 "Disagree", 5 "Strongly Disagree")

Statement	*N*	% in agreement	Mean	Standard error	Standard deviation
Any time I fall sick	241	50.2	2.21	0.08	1.26
When I fall sick and I have the money	241	56.8	2.48	0.72	1.12
When I fall sick and I do not have the money	241	19.5	3.27	0.08	1.39
When I feel sickness is getting worse	241	51.5	2.23	0.75	1.17
When self-medication does not work	241	59.0	2.48	0.70	1.11
When I am encouraged by a relative/ friend	241	40.7	2.92	0.07	1.23
When I get support from a relative/ friend	241	46.1	3.15	0.08	1.31

Table 10. Challenges in health-seeking behaviour before and after migration

Responses	Before *N* (%)	After *N* (%)
Yes	84 (34.9)	155 (62.3)
No	157 (65.1)	85 (35.3)
Non-response	–	1 (0.4)
Total	241 (100)	(241)100

As part of challenges migrants slum dwellers face in seeking care behaviour, a further assessment was carried out to ascertain how migrant slum dwellers face these challenges on Likert scale items (Table 12). The results show that nearly half 44.8% ($M = 3.26$, SD = 1.39) noted that poor quality of care poses challenge to the migrants who visited formal health-care facilities in treating their ailments. About 31.2% ($M = 2.22$, SD = 1.51) also had problems with language barrier to communicate with health-care workers when they visited care facilities. The least challenge encountered was poor attitude of health-care workers, 5.8% ($M = 4.49$, SD = 1.39).

Discussion

The social indicators of any people in a society are very important because they represent the actual status of such people in terms of their quality of life (Singh, 2016). Thus, the socio-economic status of a population depends upon the living standard of individuals within a community, while the living standard also depends upon the income of the family. This is helpful for improvement of a good life. The socio-demographic characteristics of the population in this study point to the fact that female migrants were more sampled than their male counterparts. The high proportion of females, as reported in this study, suggests that the number of females who are migrating are on the rise; this might be as a result of the benefit accrued from migration. A similar study by Awumbila *et al.* (2015) noted that the migration of young females has become a common phenomenon recently as a result of the benefit of remittances from female members who work as head porters and domestic workers in the city.

While, majority of the respondents tend to be young. The young nature of the population supports the findings in existing scholarly works that suggest that young men and women

Table 11. Challenges faced before and after migration

Challenges	Before *N* (%)	After *N* (%)
Monetary/high cost of medication	120 (49.8)	145 (60.2)
Physical impediment (laziness, disability)	5 (2.1)	–
Cultural barriers	5 (2.1)	17 (7.1)
Lack of programme education on healthy living	10 (4.1)	22 (9.1)
Poor/dirty environment	–	44 (18.3)
In adequate rest and sleep	20 (8.3)	–
Long distance from facility	40 (16.6)	–
Family support in care and in making healthy lifestyle decisions	41 (17.0)	13 (5.4)
Total	241 (100)	(241) 100

Table 12. Other challenges in health-seeking behaviour

Statement	*N*	% in agreement	Mean	Standard error	Standard deviation
1. Language barrier	241	31.2	2.22	0.97	1.51
2. Long waiting time	241	24.9	3.41	0.09	1.42
3. Poor attitude of health-care workers	241	5.8	4.49	0.52	1.39
4. Poor quality of care	241	44.8	3.26	0.90	1.39

Note(s): (Likert scale based on a 1-5 scale: 1 representing "Strongly Agree", 2 "Agree", 3 "Neutral", 4 "Disagree", 5 "Strongly Disagree")

have often accounted for the bulk migratory movements both within and outside Ghana (Awumbila *et al.*, 2015; Ginsburg *et al.*, 2014; Msigwa, 2013). Similar findings from UNICEF also note that the age of most of these migrants workers often ranges from 15–24 years accounting for one-eighth of the age groups that are often seen moving in search of better economic opportunities. As far as this study is concerned, one may say that migration in its widest sense is beneficial; however, certain age groups and categories of the population such as women and children are more vulnerable. Therefore, distress migration can expose them to poor health conditions.

Our study suggests that a majority of the respondent had low education. The low education reported among the respondents is consistent with Singh (2016), who found that in most cases, the social status of the slum dwellers is generally bad. They lack education, and as a result, they are unable to secure well-paid jobs, but rather end up with informal sector jobs, which some are sometimes dangerous and pose health risks. As education remains an important factor of the socioeconomic characteristics of households, it is not surprising that respondents end up with low-paid jobs.

As most of the respondents were reported to have been in marital relationship, this finding corroborates a study by Agesa and Kim (2001), who observed that households with more dependents are more likely to embark on migration as a livelihood strategy in Kenya. Similarly, the African Migration Project conducted a research in some selected West African countries, including Burkina Faso, Ghana, Nigeria and Senegal. The study found that the probability of a household member emigrating depends on the largeness of the household (Ratha *et al.*, 2011b). This could have accounted for the need to migrate to look for better economic opportunities to cater for left behind members of the family.

The finding from the study suggests that the three Northern Regions of Ghana push several of the youth who originate from these places to the southern cities of Ghana. The concentrations of migrants from this particular zone of the country to this slum are linked to the presence of migrant networks. This finding supports Yaro *et al.* (2011), who suggest that the clustering of the three Northern tribes of Ghana in a study should be attributed to migrants clustering due to social networks.

Like some other parts of the country, rural areas posed a limited economic opportunities for the migrants, as this served as the main reason for coming to the city. The seeming lack of economic opportunities before migration supports the scholarly work of WB (2006a) and Herrera and Sahn (2013), who argue that rural households are confronted with labour and financial market constraints, and migration serves as a means to diversify income sources and cope with risks. Although agriculture remains the dominant occupation, the low productivity and the subsistence nature of farming make it difficult for the youth to take up agriculture as an employment option in the rural areas (Leavy and Hossain, 2014). Perhaps, social network played an important role in terms of the company majority of the migrants found their way to the city. However, this finding stands in sharp contrast with other findings that suggest young people who are often engaged in out-migration tend to move alone without accompaniment, and the likelihood of independent migration increases with age (WB, 2011b). It is, therefore, no surprise that most of the migrants came in the company of a relative or friend.

According to literature, health-seeking behaviour has been defined as the remedial actions an individual undertakes to remedy perceived illness. This have often been linked to the health-seeking behaviour (Conner, 1996). In this study, we found discrepancies in many of the activities that could fulfil a substantial health-seeking behaviour in the slum as compared to the migrant's places of origin. Among these are included poor hygienic environment, long working hours, eating non-healthy diet, etc. The inability of the migrants to adhere to the health-seeking behaviour after migration supports the scholarly work of Maneze (2014), who maintains that it is difficult for migrants who have migrated to new locations for better

economic opportunities to engage in the practice of health-seeking behaviour. This is because of the many settlement needs they have to face in the current environment, health-seeking behaviour is not given the needed attention. Given the various needs they have to meet, it is not surprising that they could not adhere to health-seeking behaviour practices. Thus, the HBM's proposition that people are more likely to change their behaviour and adhere to treatments cannot fully apply to rural–urban migrant slum settings. It is, therefore, important to note that contextual issues are key, in this case, rural–urban migrant slums present a different dynamic, which must be taken into consideration.

It is important for early diagnosis of any disease condition because it is considered a tenet in oncology that paves the way to early treatment with the expectation of better health outcomes. In this study, the stage of disease before migrants approach a provider for cure presents some variations before and after migration. The relative difference in seeking treatment at a tender stage of a sickness before migration is in line with Arndt *et al.* (2002), who note that the support from relatives in seeking treatment in addition to the fact that in some countries like India, for instance, government policies tend to be rural-centric and that rural areas tend to benefit from health policies than slums because slums are illegal in nature, making the rural health better than that of slums in most cases.

As most of the migrants had to battle with various diseases in their slum communities, the frequency of disease treatment appeared to be quiet high because they migrated to the communities.

The high frequency of treatment reported in the study can be attributed to the poor sanitation, unhygienic conditions as well as risky behavioural lifestyle, which prevail in the slum. In a similar finding, the WHO (2000) argues that slums serve as breeding grounds for different types of infectious diseases as a result of poor hygienic conditions, which easily spread in highly concentrated populations. They further identified other infectious conditions such as HIV/AIDS and substance abuse as the cause of disease prevalence in slums that need to be treated.

According to Yip *et al.* (2008), the lack of financial protection among the poor vis-à-vis the cost of medical treatment has eventually forced many households further into poverty. It is, therefore, important to note that the cost of medication in times of ill health contributes to poverty among more than half of households (Krishna, 2004). Given the additional responsibility of catering for each member of the family, which is not commensurate with the meagre income they earned, it is possible the married ones would not be able to afford regular checks, as pointed out in the study.

According to the literature, the response to symptoms posed by illnesses is mediated by various factors, and one of such factors is the responses of friends, relatives and colleagues to an individual's illness, leading to the use of health-care service. The influence that relatives and friends have on their colleague's health in the study is supported by the scholarly work of Harding *et al.* (1990), when they state that the ability to use health-care services among underprivileged populations is sometimes influenced by the composition and values of one's immediate network of friends and relatives and the attitude they have towards professional health care.

Although preventive care echoed throughout the study, it is likely that the low educational background reported among the respondents might have played some role in adhering to precautions in their slum communities. Consistent with the findings by Berkman *et al.* (2004 and Dewalt *et al.* (2004), the study shows that limited functional health literacy is associated with adverse health outcomes, which lead to less preventive health behaviours and high health-care costs.

Income remained a key factor in accessing health care. It is clear that health-care needs depend on the economic position of an individual. Given the low income earnings of the respondents, policy makers and other stakeholders should make access to basic health-care

services affordable to the urban poor. One way by which this can be achieved is through the principle of universal access to health care. In a related finding, Jen *et al.* (2009) noted that the difficulties faced by the urban poor in procuring even the basic necessities of life pose a great challenge. Given the deficient facilities for safe water, sanitation, overcrowding in slums, effluent treatment and hazardous waste processing, the high rates of water- and vector-borne diseases and disorders attributable to toxic exposures in urban slums (WHO, 2011). It is no surprising that migrants were faced with various challenges in the quest to health-seeking behaviour. As pointed out by our studies, challenges were mostly reported in the slums than their places of origin. This variation could be attributed to the deficient facilities in the slums as compared to the places they originated. Other scholars like Derose *et al.* (2007) also contend that migrants encounter numerous challenges in maintaining the health-seeking behaviour in the destination in which they find themselves. This might have also contributed to the low levels of health-keeping behaviour, resulting in poor health outcomes.

Among the challenges encountered in the slum included the high cost of accessing health care, poor dirty environment, etc, which were more pronounced than what was encountered at their places of origin. This perhaps might have contributed to their inability to engage in health-seeking activities. Similar scholarly work by Hunte *et al.* (1992) found that in most developing countries like Uganda, the quality of care and other determinants have adverse effect on the health-seeking practices of poor urban communities. The above findings suggest that people are in better position to engage in health-seeking behaviours if social facilities are at their disposal. This re-emphasises the need for health planners to pay attention to contextual issues in addressing the health-seeking behaviour in poor migrants' settings.

Conclusion

The study has shown that rural–urban migration will continue as long as unequal variations in development across the country exist. Poor health outcomes are largely attributed to socio-economic status of people, and that is the case of the many migrant slum dwellers in Madina. This study has pointed out various discrepancies in many of the activities that could fulfil a substantial health-seeking behaviour in the slum as compared to the migrant's places of origin. This situation is due to the fact that for these migrants, the purpose for coming to the slum is about better economic prospects coupled with the many settlement needs they have to face in the current environment, health-seeking behaviour becomes a challenge. This study, therefore, contradicts the proposition held by the HBM. This is because of the multiple simultaneous needs migrants have to battle at the slum and the low education background reported among most of the respondents. It is, therefore, important to note that contextual issues are key, in this case rural–urban migrant slums presents a different dynamic, which must be taken into consideration. Also, the various challenges faced by the poor migrants, including the deficient social facilities, rather worsens their quest from achieving any meaningful health-seeking behaviour. This only adds to the fact that people are in better position to engage in health-seeking behaviours if social facilities are at their disposal. It re-emphasises the need for policy makers to pay attention to contextual issues in addressing the health-seeking behaviour among poor migrants' slum settings.

Implications of the study

The intricate relations between rural and urban economies have often led to the migration of the youth from rural areas to the cities, which they mostly end up in the slum with its associated health challenges. This study brings to the fore the need for improvement in the urban cities and concurrent development of the rural areas to reduce migration of the youth to the cities. There is also the need to promote a health-seeking behaviour among rural–urban

migrants' settings, taking into consideration the contextual issues pertaining to such environments. Health education programmes should not be restricted to the urban slums, but must be extended to the rural areas. There is also the need for health education and awareness creation that can go a long way to support self-care practices. Thus, both areas of origin and destination need to be informed about personal hygiene, safe disposal of solid waste, use of toilets, and the possible breeding grounds for germs and vectors.

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Challenging sustainability in school-based intervention in Nicaragua

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Abstract

Purpose – The current study identifies successes and limitations of sustaining Dale se Real (DsR) as a school-based educational intervention program related to drugs and violence for 7th and 8th grade students in Nicaragua, Central America. As evidence-based interventions are transported and imported across national borders, issues surrounding their adaptation and sustainability become important targets for investigation.

Design/methodology/approach – Interviews were conducted with nine key informants (e.g. school directors, implementers) from seven institutions, four of which sustained DsR and three of which did not. This study explores DsR's fit with the institutions' missions and routines, program adaptability, broader community support and sustainability planning.

Findings – Findings demonstrate two emerging views of sustainability within the Nicaraguan schools: a deficit approach and an empowerment approach. These two approaches imply different motivational structures for institutions and also led to the practical finding that developers and trainers need to provide structured or formal ways of empowering schools to continue implementing a program after staff no longer routinely contact them.

Originality/value – This study contributes a particular case on what facilitates and impedes sustainability of school-based interventions that can inform future intervention research in Latin American countries.

Keywords Sustainable development, Community-based intervention, Implementation, Lower middle-income countries

Paper type Research paper

A growing issue for intervention scholars is understanding how to sustain health interventions after funding is spent (Scheirer and Dearing, 2011), especially in low resource contexts that may not be able to afford continued program updates, trainings and technical support. Only about half of health programs continue after funding has ended (Scheirer, 2005), and even fewer operate at the same level of quality (Cooper *et al.*, 2015). In such contexts, promoting sustainable

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implementation of effective prevention programs may be one of the most powerful ways to produce public health impact (Catalano *et al.*, 2012; Gruen *et al.*, 2008). Policymakers, researchers and communities would benefit from learning what enables and thwarts program sustainability (Hansen *et al.*, 2007; Scheirer and Dearing, 2011). Particularly, hearing the voices of groups who initially participate and then discontinue health education programs can provide insight into reasons for sustaining or terminating program delivery.

The current study contributes toward understanding sustainability of school-based interventions by exploring these issues in the lower middle-income country (LMIC) of Nicaragua. This case is one of the first to examine health intervention sustainability in Central America. A systematic review of school- and community-based mental health interventions in LMICs identified only 32 mental health interventions represented in the literature, with a final sample of only 22 studies that fit the review criteria (Barry *et al.*, 2013). Only one of these was conducted in Central America in Honduras. Another study examined sustainability of community health workers in LMICs and identified 16 countries in their review, none from Central America (Pallas *et al.*, 2013). These reviews attest to the fact that little is known about health education in this region of the world. Moreover, as researchers in Panama warn, despite the fact that Latin America as a whole has similarities, each country has its own distinct culture which implies the need to test and implement health-based intervention programs in different cultural settings (Mejia *et al.*, 2015). As one of the poorest countries in Central America with limited intervention infrastructure, this study offers a compelling case for understanding how to best implement and sustain programs in Nicaragua. The current study adds to existing literature on the need for intervention programs that maintain adaptability and fidelity across various contexts (Hansen, 2013). As evidence-based interventions are transported and imported across national borders, issues surrounding their adaptation and sustainability become important targets for investigation.

Sustainability in review

Program sustainability is a multidimensional component generally defined as a community's continued use and implementation of an intervention program toward desired outcomes after the initial or seed funding has ended (Glasgow *et al.*, 1999; Scheirer and Dearing, 2011). Sustainability is an integral and necessary phase of intervention frameworks (Scheirer and Dearing, 2011). For example, a visionary model proposed by Glasgow *et al.* (1999) positions *maintenance* as the final state of the reach, effectiveness, adoption, implementation, maintenance (RE-AIM) framework. Program maintenance, they argue, requires institutionalization to support enduring practice or policy within an organization or community. Others (e.g. Rabin *et al.*, 2008; Weiss *et al.*, 2012) have suggested that capacity building (i.e. garnering or allocating local resources to continue intervention efforts) and adequate infrastructure are needed to maintain intervention efforts. In general, intervention sustainability requires continued attention to and mitigation of problematic conditions by *local* community stakeholders. This begs the question, what are the processes by which responsibility for delivering programs transfers to local communities?

As communities take responsibility for delivering and administering interventions, an important goal is achieving appropriate fit (i.e. aligning program's demands and an organization's ability to meet those demands). Program fit not only includes program aims and community needs but also community capacities and demands of administering a program long term (Barrera *et al.*, 2016; Wiltsey Stirman *et al.*, 2012). For example, if transportation is required to attend sessions but communities have no resources to provide it, programs likely will fail (e.g. August *et al.*, 2006). Factors of program fit that research has identified to differentiate sustained versus unstained programs were lack of administrative support, inadequate staff, problems with participant engagement, participant recruitment and competing internal demands (Cooper *et al.*, 2015). In the context of LMICs, one review identified that when communities were involved in recruiting and hiring program staff, when

the approach matched religious, moral and social norms and when communities saw the program as beneficial, there was a better chance for sustained programing (Pallas *et al.*, 2013). Sustainable programs, then, should resonate with target populations (e.g. attract and engage participants, involve communities in staffing decisions) and also match local financial and organizational capabilities (e.g. garner supportive staff and administers, attain organizational priorities). When there is alignment or good fit, local communities tend to take responsibility for interventions.

To sustain an intervention does not mean it must stay in its original form. Maintaining a good fit between a program and community often requires adaptation (Scheirer and Dearing, 2011), and programs often are sustained because of their adaptability (Barrera *et al.*, 2016; Shediac-Rizkallah and Bone, 1998). This presents a paradox: adaptability enhances stability (Chambers *et al.*, 2013). Rather than freezing a program when its efficacy is established through a randomized controlled trial and then widely disseminating it with 100% fidelity, sustainability is supported by "an alignment, compatibility, or convergence of problem recognition in the external organizational environment or community, the program in question, and internal organizational objectives and capacities" (Scheirer and Dearing, 2011, p. 2,060). Flexible fit allows programs to adjust to shifting exigencies in society, engendering sustainability.

Models for how organizations can sustain through adaptation have been proposed. All of these models attempt to balance theoretical fidelity with practical adaptation to deliver a static program in a dynamic environment. For example, Evans *et al.* (2015) suggest four "reinvention" points, which allow for interventions to be optimized through "interaction with individual agents and contextual features" (p. 761). Barrera *et al.* (2016) call for local adaptations that maintain programs' underlying theoretical mechanisms while altering aspects of a program that might enhance local sustainability. These models seek to guide the prevention community through the complex steps needed to keep essential program components while letting nonessential parts vary.

This goal is good but has not always been realized in practice. Wiltsey Stirman *et al.* (2012) reviewed 125 intervention studies and found that fewer than half of communities continued programs with high levels of fidelity and that communities sustained only particular parts of interventions rather than entire programs. This can be problematic depending on which components were kept and excluded. Other work suggests that teachers frequently adapt interventions to fit their teaching style (Pettigrew *et al.*, 2013) and to address time and external constraints (Miller-Day *et al.*, 2013). If convenience or comfort drives adaptations, there is a danger of unknowingly removing the important "active ingredients" of programs (Abry *et al.*, 2017, p. 194). Ultimately, successful programs manage fit and adaptability while leveraging existing community resources.

Other aspects that influence sustainability have been identified. In LMICs, these included having a well-designed and managed program (e.g. respected individuals as implementers, consistent and effective management of program staff, adequate training and appropriate remuneration) as well as integration of program activities within existing structures and systems. A US study showed that community outreach (i.e. presenting program findings to stakeholders) and communication with program trainers (annually or up to monthly) also significantly differentiated groups that sustained versus those that discontinued school-based programs (Cooper *et al.*, 2015). Others emphasize that planning for sustainability, not surprisingly, increases program continuation (Cooper *et al.*, 2015; Scheirer and Dearing, 2011). Based on prior research, it is important to assess how a program content fits with an institution's mission as well as capacity, program adaptability and sustainability planning.

Current study

The current study explores issues surrounding sustainability in the context of Nicaragua, Central America. Data come from an interview assessment of the Dale se REAL (DsR)

program. DsR is a school-based drug and violence prevention program. DsR is culturally regrounded (Colby *et al.*, 2013) to the Nicaraguan adolescent context from the evidence-based programs *keepin' it REAL* (Hecht *et al.*, 2006) and the *Fourth R* (Wolfe *et al.*, 2009) programs. Thus, the program content and delivery design were adapted to fit Nicaraguan youth culture and also local school implementation processes. The current study focuses on fit/adaptability, organizational support and planning surrounding the DsR program in Pacific regions of Nicaragua. This case offers a glimpse into an important topic in a region of the world that, like other LMICs, is experiencing an increase in prevention activities. This study therefore contributes to understanding some of the issues facing school-based prevention programs in LMICs where intervention programs are being transported.

The aims of the current study are to (1) assess the sustainability of DsR in various Nicaraguan institutions, (2) understand how Nicaraguan institutions describe factors that contributed to continuation or discontinuation of the DsR program and (3) discover the processes institutions use to plan for sustainability.

Methods

A total of 23 schools and youth service organizations (hereafter, institutions) implemented the DsR program in 2015. Financial support for DsR ended after implementation in 2015 and restarted with the school year in 2017, thus creating a unique window of opportunity in 2016 to explore program sustainability. All 23 institutions were invited to participate in qualitative, follow-up interviews to learn about barriers and facilitators to sustaining implementation of the program. A total of seven institutions (30%) agreed to participate and nine 20–40 min interviews were conducted with key informants (e.g. school directors, implementers). Informed consent was obtained from all participants and no compensation was offered. The seven institutions represented a total of 437 youth, about evenly split between 7th and 8th grades, ranging from eight to 60 students in each grade.

Interviews began with a broad question, "Can you please share with us about your experience with the DsR curriculum?" and continued by probing for current and future plans for implementing the program. We then asked about the factors that made it easy or difficult to implement DsR. Questions included asking about internal and external factors, decision-making process and decision-making authority as well as how schools selected program instructors. We closed the interview by asking participants to imagine they were responsible for sustaining the program and to share "the most important steps to maintain DsR for the next two years."

Interviews were originally conducted in Spanish and audio recorded. Bilingual members of the research team listened to audio recordings and typed English summaries of responses for each interview question. English summaries were then coded into four sustainability categories developed based on existing sustainability literature (e.g. Cooper *et al.*, 2015; Scheirer and Dearing, 2011). These included (1) fit with organizational mission and routines, (2) adaptability, (3) organizational readiness/support and (4) planning for sustainability. Analysis further considered which institutions continued DsR during 2016, the year following initial implementation. A total of four institutions continued the program and three did not. All institutions, at the time of the interview, stated they planned to continue or resume the program in 2017. All methods used in this study were submitted for ethical review and approved by a university institutional review board.

Results

This section presents an in-depth view of challenges to sustainability across the four predefined categories based on prior research. We assess how DsR fits with the institutions'

missions and routines, program adaptability, broader community support and sustainability planning. We used the shorthand to denote institutions that sustained DsR (s1, s15, s60, s100) and those that did not sustain (ns10, ns20, ns25).

Fit with institutional mission

All of the schools admitted that DsR fits their mission, even though only four of the seven continued delivering the program after funding ended. While the program fit institutional, social and student educational missions, it also created a tension in their mission to work alongside families, particularly by participating in a research study. Each is described in more detail.

Social. Participants indicated a desire to fulfill the cultural mandate of education, namely, to guide students toward success. For example, one participant noted, "We saw in your program the opportunity to help our society and create a positive impact. . .. The objectives of the program were pretty aligned with the school goals" (s60). Another wanted to stay relevant with emerging social concerns: "If there is something positive and new, then we will take it. Few people promote these kinds of subjects, but to us the humanitarian mission is really important" (ns25). DsR had "content" that addressed "topics that we are dealing with already" (ns10). This fit with the social mission of the institutions was attractive to all groups, weather they sustained DsR or not.

Student. In total, two themes emerged regarding how school administrators and teachers viewed the program benefitting students. First, they reported that students enjoyed the lessons – lessons were interactive, fun and engaging. Second, teachers and administrators appreciated the effectiveness of DsR for addressing issues relevant to their students. Echoed by those that sustained and those that did not, a participant stated "it did help the students and made an impact on their lives" and that DsR was "something attractive to them" (s1). The students looked forward to their DsR lessons. Not only were lessons enjoyable, but one participant reported that the program "has facts that are real, tangible and helpful so students can understand this outside world in a better and real way" (ns20). Because serving students was the primary aim of the institutions that participated in DsR, these direct benefits made the program attractive.

Parents. In general, administrators and implementers reported that after thorough explanation, parents were on board with institutions delivering the program. Some parents, though, were leery of the research surrounding the program. The formal language of the informed consent form and the types of questions that would be asked of their children in surveys were off-putting. Analysis of survey response rates indicated that some of the Catholic-affiliated schools were especially reluctant to allow their students to participate in surveys that would assess drug use and sexual experiences. Thus, the research aspects of the program created a barrier for some schools to participate. The following representative quote demonstrates the sentiment for almost all schools, regardless of whether they sustained or discontinued the program: "Parents said the program was helpful for their kids but some of them did not allow their kids to participate from the surveys since the survey consent sheet was too full of explanation that it made parents feel uncomfortable of giving us permission to collect information" (s20). This finding highlights the tension between generating an evidence base and promoting youth well-being.

Fit with institutional routines

Successfully integrating an intervention into existing organizational routines is key to sustaining a program beyond its initial funding period (May and Finch, 2009). Data from this study concurred and delved specifically into the process by which the program was adopted and by which someone was selected to deliver the program. An additional process that limited sustainability was also discovered.

Program adoption. To explore how institutions came to participate in the DsR program, interviews asked, who is responsible for deciding if DsR is taught? How is the decision made? Data revealed four different decision-making authorities: (1) school board of directors, (2) school principal/organization director, (3) academic (curriculum) director and (4) school counselor in consultation with the principal. Most institutions reported that the decision-making processes involved evaluating the program and its content before agreeing to incorporate DsR into an institution's curriculum. Criteria for adopting the program included viewing the program content as helpful, respectful and/or beneficial to students. One institution (s100) stated that the program was easy to adopt because DsR's "pedagogy matched the school's." Another institution (ns25) saw no barriers, mentioning specifically that they were able to "integrate [DsR] to our calendar." These aspects of adopting the program (fit with teaching philosophy and logistical fit with school calendar) are important considerations for understanding sustainability.

Teacher selection. This study also investigated who was selected to deliver the program and the process behind that decision. It was expected that some teachers would be instructed to deliver the program, whereas others would volunteer. In this sample, however, all the institutions admitted that school directors and other administrative authorities made the decision to adopt DsR or not. This top-down approach was described by one school (s60) as a process: "First, the program was presented [to the school], then it was assigned to a department, and then [delegated] to one of the teachers." The interview revealed that these processes also involved careful analysis to determine the most appropriate, qualified person for implementation. "The director thought the psychologist was the most ideal teacher since she has all the abilities to address and carefully handle the subjects [of drug use, bullying, and dating violence]" (s60). This process for determining who could best deliver DsR was typical for all institutions regardless of whether they sustained the program.

Where schools varied, however, was in their methods for determining the most qualified instructor to deliver DsR. One institution selected the teacher based on her "willingness, capacity, intelligence, and availability" (ns25). Another administrator stated "the willingness of the teacher, the experience, and the class assigned to be taught" were factors that determined who would implement DsR (ns10). Administrative decision makers "analyzed where the program would best fit according to its content and then sent the teachers to be trained about it" (s1). Many of the schools delivered DsR through a mandatory civic-oriented class, a social science course or through a natural science course. These decisions seemed to be motivated by a desire to find someone who would not merely deliver the program from "obligation" (ns25).

Teacher turnover. Analysis of sustainability and fit with existing routines resulted in an unexpected, emerging finding: teacher turnover. One institution that did not continue the program explained "one of the teachers left the country and the other was moved to another area within the school" (ns10). Echoing this turnover, another participant stated, "there are two teachers that are not at the school any more but there is still one that liked the program because it was interactive" (ns20). Across all schools, there were three that explicitly stated that sustainability was hampered due to teacher turnover. Based on observation of other experiences in Nicaragua, it is likely that turnover, not only of teachers but also of directors, is a serious issue and should be factored into any plans for sustainability.

Adaptability

Very few responses were coded as adaptability. Coded segments came from three institutions, two of which sustained delivery and one that did not. Participants called for changes to the program content (e.g. updating terminology to ensure students identify with the video materials) and also logistics. The rarity of the calls for adaptation should be noted.

All the schools stated that the program content connected with their students and, for the most part, that teachers enjoyed teaching it. An illustrative quote demonstrates appreciation for the program and also desire for flexibility in its implementation: "The teacher who implemented the program liked it; however, she thinks it is a little bit extensive. Although it was easy to follow, sometimes she had to skip or adjust some lessons to the school curriculum and time" (s60). Adapting the program is necessary; however, content adaptation of DsR was less important than flexibility in delivery options.

Broader community support

One emerging influence on the sustainability of the DsR program was the importance of ongoing contact and support from the program developers. When asked about factors that impeded or facilitated sustainability, there was a clear divide in responses from schools that discontinued DsR and those that sustained the program. Institutions that did not sustain the program stated, "people in charge of the program disappeared without letting [us] know what was going to happen after the first year of implementation" (ns25). Another participant echoed this sentiment, "The school wanted to implement it but there was not follow up from the DsR end" (ns10). Lack of follow-up from developers clearly created a barrier for some institutions. None of the schools that continued to implement the program, however, cited this as an impediment. One participant even summarized the opposite perspective: "DsR provided all the materials, teachers' trainings and follow ups to our school" (s60). Another institution that sustained DsR even mentioned a need to expand it. This participant believed "there was a lack of communication with parents. . .[so] training teachers to lead parent workshops is good" (s1). Thus, the data show that some institutions needed accountability and support to continue implementing the program but others did not.

Planning for sustainability

Another way of assessing the processes related to sustainability was to explore what steps institution directors and implementers would take to plan for sustainability. The interview asked participants to imagine that constituents wanted to continue DsR and that they would lead the effort to sustain it for two years. Participants shared what would be done first, second and third. Since interviews came from nine participants, there were nine plans from across seven different schools. Information from multiple participants within the same institution was combined in order to have four plans from institutions that sustained DsR and three from institutions that did not.

From institutions that sustained the program, administrators and implementers first identified a need to adapt the program to allow for logistical constraints. "Some lessons are repetitive. So, the time of the activities . . . should be reduced" (s60). Similarly, one participant recommended to "adjust the materials and make them less extensive" (s100). In total, two of these groups also mentioned changing the narrative videos that are part of five different lessons. One school had no technological devices that were able to play the videos. Another suggested altering the content of the videos to make viewers feel cared for and understood (s15).

In total, two of the sustaining schools also mentioned outreach to families as an important part of planning for sustainability. One suggested "First, workshop for family leaders, information for neighborhood over the importance of participating and the relevance of the subject" (s1). Another participant recommended "Sharing with parents about the program in a less formal way," likely stemming from hesitance caused by the formal consent forms, which many parents viewed as off-putting (s60). Altering content and expanding to families were two suggestions that came from institutions that sustained the program, so one can assume that they represent surmountable barriers.

Findings from institutions that did not sustain DsR were enlightening. Their suggestions may represent actual barriers they faced or may envision an ideal situation for implementation. Interestingly, the plans for those who did not implement the program are more detailed than other institutions (i.e. all include a third step, whereas most schools in the sustaining group did not include a third step). Their plans also reflect less familiarity with the program. For example, they requested that the material include more interactive elements which were part of every lesson.

One participant (ns25) recommended adjustments to the materials (e.g. student books, homework assignments, reflection/debriefing times) and improved teacher development (e.g. stimulate and motivate teachers, create feedback session with teachers). Another participant provided an outline for consecutive steps needed to establish the DsR program. They recommended obtaining permission, becoming an active presence in the classroom and maintaining active, open channels of communication between the DsR staff and the school (ns10). A third participant recommended bringing guest speakers to the classrooms, adjusting the parental consent form to be less intimidating and incorporating "more activities to promote the participation and commitment of the students, like debates and drug conferences from the DsR staff in the classrooms" (ns20).

There was less consistency/overlap among the suggestions emanating from these nonsustaining schools. There also appeared to be less familiarity with the DsR program content, materials, activities and format. Notwithstanding, these suggestions signify barriers to sustainability such as (1) inadequate teacher training and supports, (2) unengaging student materials and activities and (3) limited involvement from program developers and experts (i.e. the DsR team). Overall, the nonsustaining schools seemed to want DsR staff to do more direct instruction with youth (e.g. class debates, follow-ups, observations) which may belie issues some institutions face in finding, motivating and compensating excellent teaching staff or may indicate poor fit with existing organizational routines.

Discussion

This study provides insight into sustainability in the context of a LMIC. Particularly, findings shed light on processes that facilitate and impede sustainability. Despite coming from a limited number of schools and few participants, the data are compelling because they explore an overlooked and emerging context for prevention activities. This interview study provides an in-depth look at how sustainability occurred or did not occur. In addition, this is the first study of its kind that examines intervention sustainability in a Central American country and offers a particular look at the Nicaraguan school and youth serving organizational context.

Findings demonstrate two emerging views of sustainability within the Nicaraguan institutions. We call the first a deficit approach and the second an empowerment approach. Those operating from a deficit approach discontinued the program. The deficit approach required additional supports from the DsR team to continue delivering the program. They wanted to see more direct involvement between the program developers and students (e.g. teaching the program directly to students, presenting at school assemblies). This approach also seemed to need external accountability to continue the program (e.g. team phone calls and emails).

Conversely, the empowerment approach was adopted by groups that sustained the program. These institutions felt they had been given all they needed to continue the program and effectively influence their youth. Participants even suggested integrating the program into the broader community by expanding to reach parents of youth. Their planning for program sustainability was marked by adaptation to fit their logistical and constituent needs.

Although studies in the US context have identified the need to maintain contact between program developers and trainers (e.g. Cooper *et al.*, 2015), in the Nicaraguan context, this need

only emerged in the deficit approach. Indeed, the average level of contact for sustaining groups in the USA was somewhere between annually and monthly, but the groups in the Nicaraguan context expected more frequent contact. Such groups may legitimately need additional resources and supports, such as direct and sustained contact with program trainers, whereas those adhering to an empowerment approach do not. Future research could examine how much contact is required and what type (e.g. training, ongoing support, direct contact with students, continued training workshops). Findings also may signal particulars of the Latin American or Nicaraguan social context. For example, Nicaraguan and Latin cultural expectations for relational maintenance (Leffers and Mitchell, 2011) may be different than in other countries and, thus, more time spent nurturing relationships and supporting program implementers may be needed.

Considering the deficit and empowerment approaches also leads to an important practical finding. Namely, developers and trainers need to provide some structured or formal way of empowering schools to sustain programs. For some schools there may need to be a clear transfer of authority, a ritual to empower them to continue the program. This may take form in a matriculation ceremony for teachers who have delivered the program or perhaps a formal post-implementation guide that releases schools, teachers and counselors to continue implementing the program for the benefit of their youth. Such ceremonial and practical events may help demark involvement from program developers to empower institutions to sustain the program for their students and the social good.

These approaches may tap into the motivational structure of institutions. Empowerment approaches seem intrinsically motivated to improve youth and society. Those from a deficit approach may be more extrinsically motivated to fulfill this mission. Thus, contact by the DsR team provided the accountability or support needed to motivate their involvement and sustainability. Identifying factors that determine which institutions are intrinsically and extrinsically motivated may facilitate strategic investments that can promote sustainability.

A similarity between the Nicaraguan context and the US context is the need for adequate staff. Over a decade ago, in their review of implementation research, Fixsen *et al.* (2009) highlighted staff selection as one aspect of a comprehensive implementation framework. The importance of selecting the right people to implement and support health programing has not changed and appeared in the Nicaraguan context as well. In this study, both sustaining and discontinuing schools underscored the importance of selecting qualified teachers. This process was designed to ensure that the person delivering the program was qualified and not obliged. Plaguing both sustaining and discontinuing schools, however, was high turnover. In fact, one school not included in these analyses had 100% turnover of staff (director and all teachers). Some have suggested one strategy for overcoming this obstacle is to recruit multiple actors who work as program champions from multiple levels of an institution (see Gagnon and Pettigrew, 2018; Mihalic and Irwin, 2003).

Another finding highlighted in this data is the importance of maintaining an ecological view of these Nicaraguan institutions. Organizations are embedded and connected with other social systems (e.g. family, peer, political, neighborhood, etc.). These social systems interface in important and consequential ways (Pettigrew *et al.*, 2018). School-based programs, to gain longevity and buy-in, may need to support these broader concerns. If developers only think about immediate institutional missions (e.g. educating the young), they will miss the other key stakeholders who support youth and schools. This may be especially pronounced in the Latin culture of Nicaragua that values family input (Espinoza, 2002). Influences such as family inform the adaptability and fidelity of intervention programs when applied across cultural contexts.

A primary limitation of the current study is sample size. Few interviews from a limited number of schools offer a small number of cases from which to extrapolate results. Additionally, the small sample did not allow for any statistical tests for group differences.

The dynamics faced by sustaining and nonsustaining institutions in the sample may also be different from the larger group of schools. Our response rate (30%) was adequate for a qualitative pilot study but is not large enough to extrapolate findings to the broader group of institutions that implemented DsR. Instead, these qualitative findings offer descriptions that help generate hypotheses for future study and practice. That is, although few in number, the interviews collected provide insight into sustainability work in a novel and important cultural context.

In the final analysis, the goal of intervention work is not sustainability, *per se*, but rather decreased substances use initiation and violence among youth. An intermediate goal that may achieve this long-term outcome is an effective and sustainable program. Since LMICs are increasingly importing evidence-based programs from other countries, learning the processes involved in developing and planning for sustainable interventions can have significant returns. Thus, lessons learned from the Nicaraguan case can assist others doing work in Nicaragua and perhaps also in the Central American region.

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Education-smoking gradient and upstream health policies: comparing Generation X with millennials

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Abstract

Purpose – Over the years, many upstream health policies have sought to reduce smoking across populations. While smoking has been substantially reduced, the effects of these policies on education-smoking gradient remain unclear. The present paper compares the education-smoking gradient among the Generation X and the millennials, who grew up with different types of upstream policies.

Design/methodology/approach – The study relies on regression analysis. The data are from the Canadian Tobacco, Alcohol and Drugs Survey of 2017, with the sample restricted to those born between 1965 and 1995.

Findings – At the zero-order, the education-smoking gradient has not significantly flattened from Generation X to millennials. And, accounting for the channels of impact of education on smoking does not substantially change this pattern.

Social implications – The implications for health inequalities associated with socioeconomic status, and tobacco consumption reduction policies, are discussed.

Originality/value – This paper is the first study of the kind using Canadian data.

Keywords Education, Health, Smoking, Tobacco control policies, Canada

Paper type Research paper

1. Introduction

The widely documented education-health gradient indicates that higher education promotes a better health during the life course and ultimately a longer life (Deaton, 2002; Conti *et al.*, 2010; Braakmann, 2011; Dilmaghani, 2020). Several channels have been proposed to link education with health outcomes. One important pathway from education to health is through lifestyle choices, including a better diet and a more active life (Mirowsky and Ross, 2015), opportunity to work in lower risk occupations (Khang and Kim, 2005), as well as a lower incident of smoking (Farrell and Fuchs, 1982; Hernandez *et al.*, 2019). The smoking channel is increasingly investigated in the literature (Jürges and Meyer, 2020). In the USA and Canada, the prevalence of smoking is twice among those with less than a high school education, compared with those with a college degree (Pampel, 2005, 2006; Smith *et al.*, 2009; Gagné and Veenstra, 2017; Wang, 2018).

Smoking has been subjected to one of the greatest cultural shifts in the past several decades. Particularly, in the early 20th century, smoking was more prevalent among the highly educated, as an indicator of a sophisticated lifestyle (Jürges and Meyer, 2020). Gradually, this behaviour was copied by those in the lower socioeconomic strata, and smoking rates lost its association with education (Jürges and Meyer, 2020). With the gradual shifts towards widespread recognition of deleterious health effects of smoking (Wilkinson, 2002; Pampel, 2006), more educated abstained from smoking at higher rates than those with a lower educational attainment, eventually leading to the downward sloping education-smoking gradient (De Walque, 2010). These shifts have been accompanied with numerous policy measures, from higher excise taxes to smoking bans mandated by authorities as well as private workplaces (Carpenter, 2009; Hernandez *et al.*, 2019). Consequently, one can

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indubitably claim that in the 2010s, smoking is stigmatized in many countries (Stuber *et al.*, 2008).

In this context, an important research question is how these "upstream" measures have affected the education-smoking gradient. The upstream smoking policies, such as the smoking bans, affect all the population in the same way, regardless of their education and socioeconomic attainment. Such policies can either steepen the education-health gradient or flatten it (Pampel *et al.*, 2014). Particularly, if the smoking bans, as they equally apply to everybody, reduce the greater smoking propensity of individuals with a lower education, the gradient will flatten. On the other hand, if more educated people are more responsive to such bans, the gradient may steepen, leading to greater health inequalities. This side effect of public health initiatives has the potential to intensify the health inequalities associated with socioeconomic status. Additionally, given that smoking is transmitted across generations, these inequalities may persist or deepen over time and across generations (Hernandez *et al.*, 2019).

As a leader in tobacco control and a 2004 signatory of the World Health Organization Tobacco Control Convention, the Canadian government has committed to an "endgame" target of less than 5% tobacco use by 2035 (Chung-Hall *et al.*, 2018). Across Canadian provinces, public smoking bans came into effect during the mid-2000s, with all the legislations also banning smoking in proximities of the doors. With these new regulations and local by-laws (Carpenter, 2009), the restrictions faced by smokers has substantially tightened in the 21st century. The aim of the measures implemented in years 2000s onwards has been a population-wide reduction in smoking rates. But if people of different socioeconomic statuses respond differently to these measures, smoking and health inequalities associated with socioeconomic attainment, especially education, may increase as a result of these policies (Pampel *et al.*, 2014). One way to investigate this question is to compare the education-smoking gradient between millennials, who reached adulthood in the 2000s, with the previous generations, the Generation X. The Generation X has been informed of the risks of smoking but has faced little upstream bans, in contrast to millennials.

This study, by comparing two successive generations of Generation X and millennials, seeks to evaluate the impact of Canadian smoking reduction policies on the education-smoking gradient. Given the shifts in smoking reduction regulations in Canada, the choice of these two generations is very appropriate for the examination of the effects of upstream tobacco control policies on education-smoking gradient. The data used in this paper are from the Canadian Tobacco, Alcohol and Drugs Survey of 2017. This data set includes detailed information on the respondents' current and past smoking, alongside information about the respondents' education and labour market status, as well as their perception of smoking risks. The analysis shows that the education-smoking gradient has not significantly flattened across these two generations. There is even some evidence for its widening. Hence, the findings imply that the "upstream" health policies may contribute to an intensification of health inequalities associated with socioeconomic status. The remainder of this paper is organized as follows. The next section reviews the related literature. Section 3 describes the data and the methodology. Section 4 reports the results. A discussion and the concluding remarks follow.

2. Literature review

The education-health gradient is well documented across disciplines (Deaton, 2002; Oreopoulos and Salvanes, 2011; Trisnowati *et al.*, 2020, 2021). In economics, the productive efficiency models surmise that more educated people garner better health outcomes from inputs similar to the less educated (Grossman, 1972), while allocative efficiency models assume that more educated people use a different combination of inputs than the less

educated (Cutler and Lleras-Muney, 2010). Moreover, education grants greater financial resources which allow to purchase better health; it also leads to employment in safer occupations (Barbeau *et al.*, 2004). Education, additionally, brings about a greater awareness of health hazards and better problem-solving skills, to act on new health information (Cutler and Lleras-Muney, 2010). Lastly, education may affect an individual's reaction to risk and time discounting, which, in turn, results in healthier lifestyle choices (Becker and Mulligan, 1997). One important lifestyle choice is the decision to smoke.

The well-documented inverse relationship between education and smoking has been justified based on several channels (Reid *et al.*, 2010b; Hernandez *et al.*, 2019). More educated people might be better placed to appreciate the detrimental health effects of having a smoking habit, and better able to overcome it, if it has already developed (Kenkel, 1991; De Walque, 2007; Pampel *et al.*, 2014). In addition, economic resources resulting from higher education allows for the acquisition of smoking cessation tools (Honjo *et al.*, 2006; Reid *et al.*, 2010a). In parallel, according to the rational addiction model (Becker *et al.*, 1991), high-earning individuals have greater expected gains from longevity than those with lower earnings, which incentivize them towards life-extending choices (Harris *et al.*, 2002). In contrast, for people with a lower socioeconomic status, the probability of premature death from other causes, such as occupational hazards, is higher. This higher probability of premature death reduces the perceived costs of smoking (Harris *et al.*, 2002; Pampel *et al.*, 2014). Finally, as a mechanism to cope with stress, smoking may be more valuable to those with a lower socioeconomic attainment, who may face greater life strains (Pampel, 2006).

Across the globe, smoking underwent a rather unique cultural shift and has been subjected to numerous policy interventions (Wilkinson, 2002; Pampel, 2006). As noted in several reviews, the most effective measures implement a combination of higher taxes, clean air laws and by-laws, media campaigns and smoking cessation support hotlines (Levy *et al.*, 2004; Hopkins *et al.*, 2010). Accordingly, in the past couple of decades, across jurisdictions, governmental "upstream" smoking reduction policies have been extensively introduced (Hernandez *et al.*, 2019). Typically, the government-mandated smoking bans provide smoking disincentives. Some argue that these disincentives are stronger among those with a lower education. For instance, blue-collar workers are less likely to be covered by organizational smoke-free policies in their workplaces. For them, a nation- or state-wide smoking ban can provide the otherwise absent disincentives (Moskowitz *et al.*, 2000; Pampel, 2009; Pampel *et al.*, 2014). Likewise, governmental smoking bans in bars and restaurants discourage smoking among hospitality service workers, generally those with lower education.

For decades, the Canadian government has actively sought to reduce smoking, with a target of less than 5% tobacco consumption by 2035 (Chung-Hall *et al.*, 2018). As a leader in tobacco control and a 2004 signatory of the World Health Organization Tobacco Control Convention, Canada is the first country to implement pictorial health warnings on cigarette packaging. Presently, anti-tobacco policies generally employ a mix of taxation, regulation and education (Stephens *et al.*, 1997; Levy *et al.*, 2004; Hopkins *et al.*, 2010). As such, Canada actively implements the World Health Organization's six measures of (1) monitoring tobacco consumption, (2) protecting people from tobacco smoke, (3) offering help to quit tobacco use, (4) warning about dangers of tobacco, (5) enforcing bans on tobacco advertising, promotion and sponsorship and (6) raising tobacco taxes (Chung-Hall *et al.*, 2018). As Canada, like the USA, is a federal state, cigarette taxes and smoking regulations are enacted at the provincial level, with possibility of by-laws at lower levels (Fichtenberg and Glantz, 2002; Levy and Friend, 2003). In Canada, cigarette prices and no-smoking by-laws vary greatly among the ten provinces. As a result, it is impossible to provide an exhaustive list of these measures in this paper [1]. But, a comparison of price and policy differences among Canadian provinces reveals that smoking is reduced when cigarette prices are high and no-smoking bylaws are

widespread (Stephens *et al.*, 1997). In Canada, eight provinces and territories have adopted strictly smoke-free workplace policies, covering more than 80% of the population (Carpenter, 2009). In fact, many private firms in Canada instituted smoke-free policies well before governmental legislations. Carpenter (2009) finds that adoption of local smoking bans in Ontario, the most populated Canadian province, significantly increased workplace smoking restrictions, with greater effects on exposure to others' smoking as well as one's own smoking by blue-collar workers.

Moreover, Canada does not allow smoking rooms in the airports since 1 January 2007 (Statistics Canada, 2008). Currently, in some Canadian cities, all smoking on municipal properties is banned, except in designated areas (CBC, 2018). Canada has also implemented sweeping product regulations, including a ban on all cigarette flavourings in 2010 and a ban on menthol in 2017 (Chung-Hall *et al.*, 2018). Regarding taxes, between 1982 and 1992, cigarette taxes increased sharply. The cigarette tax was fairly stable across provinces until 2000. In the 21st century, the first tax increase was applied in April 2001. Then, from 2001 to 2002, the federal excise tax increased from $10.99 to $15.85 per carton (Azagba and Sharaf, 2011). The tax increases were kept up across most provinces, on a yearly basis, thereafter. The price increase resulting from higher taxes of the 2000s is likely to be more effective to prevent millennials from smoking, as in these years, they were much younger than the Generation Xers and had lower incomes. Aside from taxes, the members of Generation X could smoke on campus, in restaurants, bars, offices and on airplanes. Also, they did not face pictorial health warnings on cigarette packages (Carpenter, 2009; Chung-Hall *et al.*, 2018). All in all, it is fair to say that millennials faced much more intense tobacco reduction interventions than the Generation X in their youth, when a person's smoking habit usually develops. The goal of this paper is to examine whether these differential policies has also impacted the education-smoking gradient.

Despite the importance of the subject matter, there have only been few studies of the effects of the tobacco reduction measures on education-smoking gradient (Reid *et al.*, 2010b; Hernandez *et al.*, 2019). Focusing on smoking tax policies, the literature review of Thomas *et al.* (2008) indicates that increasing the price of tobacco is more effective in reducing smoking in low-income people and those in manual occupations. Using the US data of 1976–2006, Pampel (2009) finds a small decline in educational disparities in smoking, but only owing to the trends among the Hispanic and the foreign-born individuals. In fact, Pampel (2009) also finds that education-smoking gradient among white, African American and other native-born respondents did not flatten. Reid *et al.* (2010a), using data from Canada, the USA, the UK and Australia, find that smokers with higher education and income are increasingly more likely to intend to quit. Finally, Hernandez *et al.* (2019) report that upstream smoking reduction policies are more effective among American young adults with the lowest levels of parental and own education. Hence, Hernandez *et al.* (2019) provide evidence for the effects of upstream policies towards flattening of the gradient.

However, there are reasons to expect that smoking ban policies may be less effective among those with a lower education. In sociology, social resource theory argues that the greater resources and anti-smoking motives of privileged individuals outweigh the immediate disincentives provided by smoking bans (Pampel, 2009). Namely, faced with the bans, more educated and high-income individuals have the possibility to mobilize greater (financial) resources to overcome their smoking habits than others (Honjo *et al.*, 2006; Smith *et al.*, 2009). Moreover, high-income individuals usually have lower stress for which smoking may serve as a coping mechanism (Wilkinson, 2002). In economics, the rational addiction model (Becker *et al.*, 1991) and the greater future orientation of more educated people (Becker and Mulligan, 1997; Pampel *et al.*, 2010) imply that they may be better able to react to the explicit and implicit costs of smoking, including locational bans. Finally, there is a substantial literature on the link between education and delinquency as well as criminality (Tanner *et al.*, 1999; Hannon, 2003; Chalfin and Deza, 2019). This literature suggests that, given their greater

tendency towards delinquency and crime, smoking bans might be less effective for those with lower educational attainment (Azagba and Sharaf, 2011; Guindon *et al.*, 2017). In light of these divergent theories, without an empirical examination, the effects of upstream smoking reduction policies on education-smoking gradient remain unclear. No Canadian study has been previously conducted on the effects of upstream tobacco reduction measures on education smoking gradient. Hence, the present study fills a literature gap.

3. Data and descriptive statistics

The data used in this paper are from the Canadian Tobacco, Alcohol and Drugs Survey (CTADS) of 2017. The survey design is a two-phase stratified random sampling of telephone numbers. In the first phase, households are selected using a random digit dialing of phone numbers in Statistics Canada's administrative files. In the second phase, based upon household composition, none, one or two individuals in a household are selected to be interviewed. This two-phase design is used in order to increase the representation of individuals belonging to the 15 to 24 age group in the sample. Subsequently, the data are collected by computer-assisted phone interviews (Statistics Canada, 2019) [2]. In this paper, the sample is restricted to those born between 1965 and 1995. Hence, the data cover the Generation X, born between 1965 and 1980, and the millennials, born between 1981 and 1995 (Denham, 2002). As the data are collected in 2017, the respondents in the sample are at least 22 and at most 52 years of age. This sample restriction means that the core of educational attainment has been completed at this time. In order to put the younger respondents at equal footing with the older ones, having a bachelor's degree and a graduate degree are coded together by a dummy for "university degree".

Given the focus of the CTADS, there are numerous questions regarding respondents' smoking, drinking and illegal drug use patterns. Regarding smoking, there are questions which identify respondents who have ever smoked and those who currently smoke. These questions also differentiate daily smokers from occasional smokers. Moreover, the respondents are surveyed on their perception of risks associated with the two tobacco consumption ways of (1) smoking cigarettes and (2) smoking e-cigarettes and water-pipes, with four specifications of (1) daily, (2) occasionally, (3) while pregnant and (4) in presence of babies. Hence, there are 8 "risk perception" questions in the survey. The responses are recorded on a 4-item scale of Great, Moderate, Slight and No risks. Using these 8 questions, a Risk Perception Index is created, varying between 8 and 32, by adding the individuals scores (4 for Great risks and 1 for No risk). In addition, the CTADS contains information on the highest degree attained by the respondents, and other sociodemographic variables.

Table 1 reports the descriptive statistics by generation and gender. After the list-wise deletion of the missing data and the sample restrictions by year of birth, there are 6,323 observations in the data set. In this sample, there are 924 male Generation Xers and 1,321 female Generation Xers. Among millennials, there are 1,966 males and 2,094 females. Given the oversampling of the younger cohorts, the number of observations on millennials is greater than Generation Xers. Nonetheless, the samples remain large enough by generation and gender. The CTADS' sampling weights are used to achieve nationally representative estimates. As shown in Table 1, for both male and female Generation Xers, the average age is 44.51. For millennials, the average age is 28.96 and 29.26 for males and females, respectively. Given their age, Generation Xers are more likely to be partnered (married or common-law). Among Generation Xers, females are less likely to either be a high school dropout or have a university degree. In contrast, among millennials, females are more likely to have a university degree than males. According to these data, among Generation X, 17.4% of males and 14.1% of females are daily smokers. These rates drop to 12.1 and 9.6% for millennial males and females, respectively. The rates have been much higher, evident from the statistics on

	Males		Generation X Females		*T*-tests		Males		Millennials Females		*T*-tests	
	Mean	SD	Mean	SD	*t*-stat	*p*-value	Mean	SD	Mean	SD	*t*-stat	*p*-value
Age	44.51	4.826	44.51	4.638	0.590	0.555	28.96	4.299	29.26	4.329	−3.256	0.001
Partnered	0.805	0.396	0.741	0.438	4.426	0.000	0.479	0.500	0.539	0.498	−6.406	0.000
Below high school	0.040	0.197	0.014	0.116	5.169	0.000	0.027	0.162	0.017	0.131	4.349	0.000
High school	0.218	0.413	0.155	0.362	2.432	0.015	0.257	0.437	0.168	0.374	8.166	0.000
2-Year college	0.328	0.469	0.464	0.499	−3.219	0.001	0.417	0.493	0.348	0.476	0.761	0.447
University	0.380	0.485	0.352	0.478	−1.393	0.164	0.290	0.454	0.434	0.496	−11.022	0.000
Daily smoker	0.174	0.379	0.141	0.348	0.695	0.487	0.121	0.326	0.096	0.295	4.485	0.000
Ever a daily smoker	0.409	0.492	0.365	0.482	2.368	0.018	0.321	0.467	0.242	0.428	5.747	0.000
Risks perception index	16.452	13.575	17.283	14.078	−2.401	0.016	18.980	12.036	20.240	11.926	−1.934	0.053
Employee	0.663	0.473	0.638	0.481	0.375	0.708	0.729	0.445	0.722	0.448	0.020	0.984
Self-employed	0.202	0.401	0.136	0.343	3.242	0.001	0.085	0.280	0.068	0.251	1.481	0.139
Rural	0.146	0.353	0.183	0.386	−0.874	0.382	0.165	0.372	0.132	0.339	−0.359	0.719
Observations	942	–	1,321	–	–	–	1,966	–	2,094	–	–	–

Note(s): The data source is the Canadian Tobacco, Alcohol and Drugs Survey (CTADS) of 2017

Table 1.
Descriptive statistics

"having ever been a daily smoker", at 40.9 and 36.5% for men and women of Generation X, respectively. Among millennials, the rates of "having ever been a daily smoker" are 32.1 and 24.2% for males and females, respectively. Finally, the Risk Perception Index is somewhat higher among millennials than the Generation X. Figures 1–3 provide visuals for some of these statistics.

To assess the education-related smoking gaps, the equation below is estimated:

$$y_i^h = \beta_0 + \sum_{j=1}^{3} \beta_j \text{Education}_i^j + X_i\delta + \varepsilon_i \quad h = 1, 2$$

The variables denoted by y_i^h capture two outcomes of (1) daily smoking now or in the past ("ever a daily smoker"); (2) daily smoking now, for individual i. These outcomes are by definition binary. Thus, a linear probability model is assumed, and the equations are estimated using OLS. In the Appendix, ordered probit estimations are shown as a robustness test. The coefficients of interest are denoted by β_j, for the three dummy variables of (1) below high school, (2) two-year college and (3) university education, leaving those with a high school education as the omitted category. Given the estimation methodology, the coefficients of education variables will indicate the percentage point changes in the respective outcomes.

The controls are included in the vector X_i. The vector includes a second-order polynomial of age, marital status and household size, ethnicity (Francophone, Aboriginal), employment status (employee, self-employed), the province of residence and a dummy for residence in rural areas. Most of these variables are affected by education. Hence, rather than being confounders, they are channels through which education may affect smoking. For instance, those with higher education may be more responsive to locational push-and-pull factors and

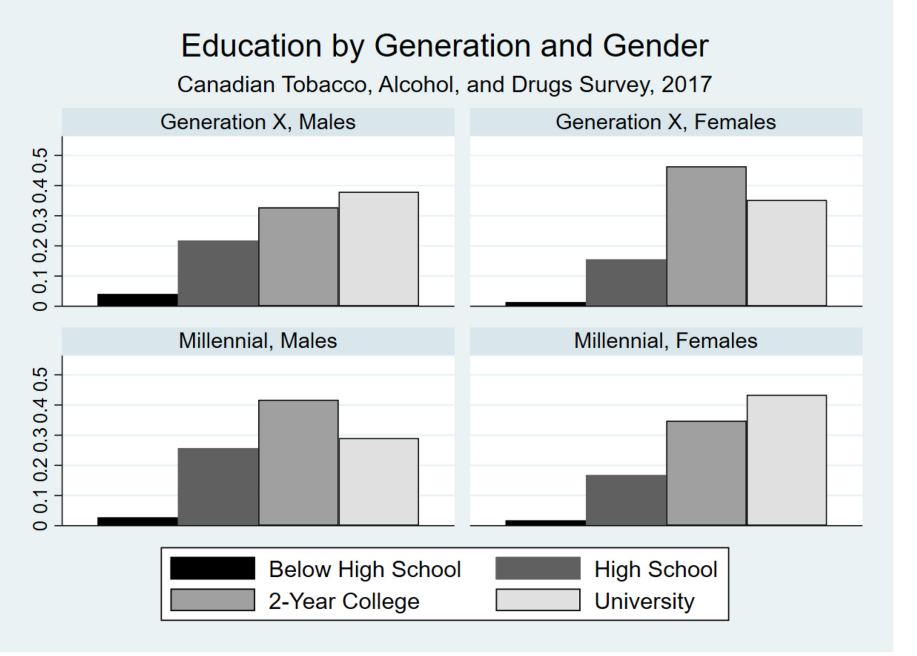

Figure 1.
Education by gender and generation

Note(s): The data are from the Canadian Tobacco, Alcohol, and Drugs Survey of 2017

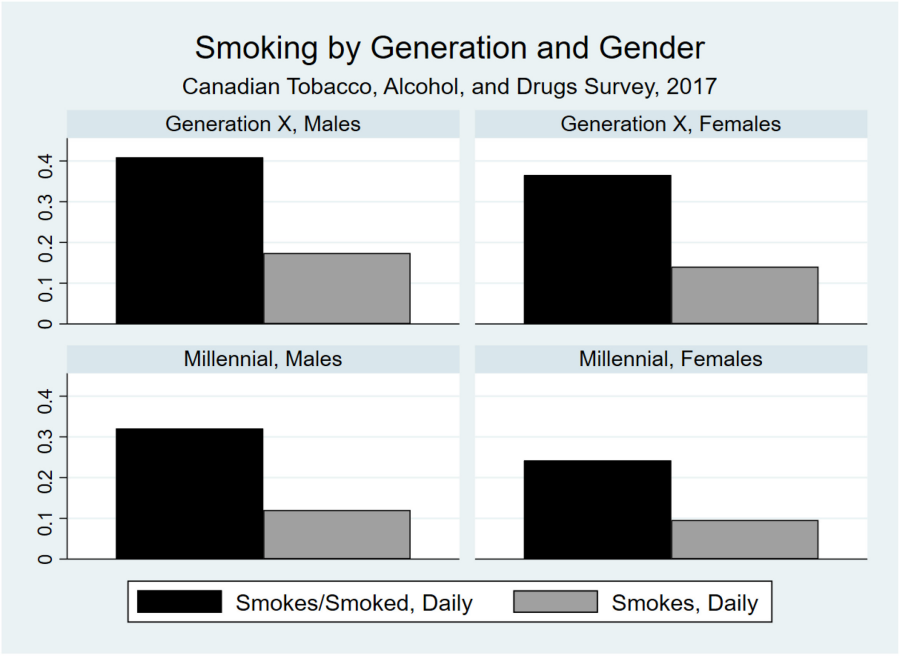

Figure 2.
Smoking by gender and generation

Note(s): The data are from the Canadian Tobacco, Alcohol, and Drugs Survey of 2017. The provincial abbreviations are as

are more likely to reside in larger urban centres, while smoking bans may be more strongly enforced in urban areas. There is also a dummy taking the value of 1 for those who are married or live common-law, while emotional support of a partner (or lack thereof) is consequential for smoking decisions (Cutler and Lleras-Muney, 2010). Finally, the Risk Perception Index is included in the equations. The inclusion of this variable helps assessing how much of the education-smoking gradient is due to the greater risk awareness of more educated people. Given the high correlation of income and education, income is not included in the regressions.

Before discussing the results, the limitations of this study must be noted. First, the main limitation of this study is its inability to make causal claims. Education, health and health behaviours remain endogenous to the unobserved individual characteristics (Kenkel, 1991; De Walque, 2007; Bijwaard *et al.*, 2015). Risk and time preferences, cognitive ability and initial health could cause both a higher educational attainment and better lifestyle choices. A number of studies which examine the causal effects of education on smoking (Kenkel *et al.*, 2006; De Walque, 2007; Grimard and Parent, 2007; Jürges *et al.*, 2011; Brunello *et al.*, 2016) find that education causes a reduction in smoking. Unfortunately, the present data did not allow for the use of a richer set of controls or an instrument for education. Particularly, since the data did not include the province of birth, it remained impossible to effectively implement the usual instrument of school leaving age laws to isolate the causal effects of education on smoking (Jürges *et al.*, 2011; Kemptner *et al.*, 2011; Oreopoulos and Salvanes, 2011; Li and Powdthave, 2015). Second, the smoking measures are self-reported, and the inaccuracies incorporated in self-reported measures may vary by education. For example, highly educated smokers, who face a greater social stigma for smoking, may underreport their smoking

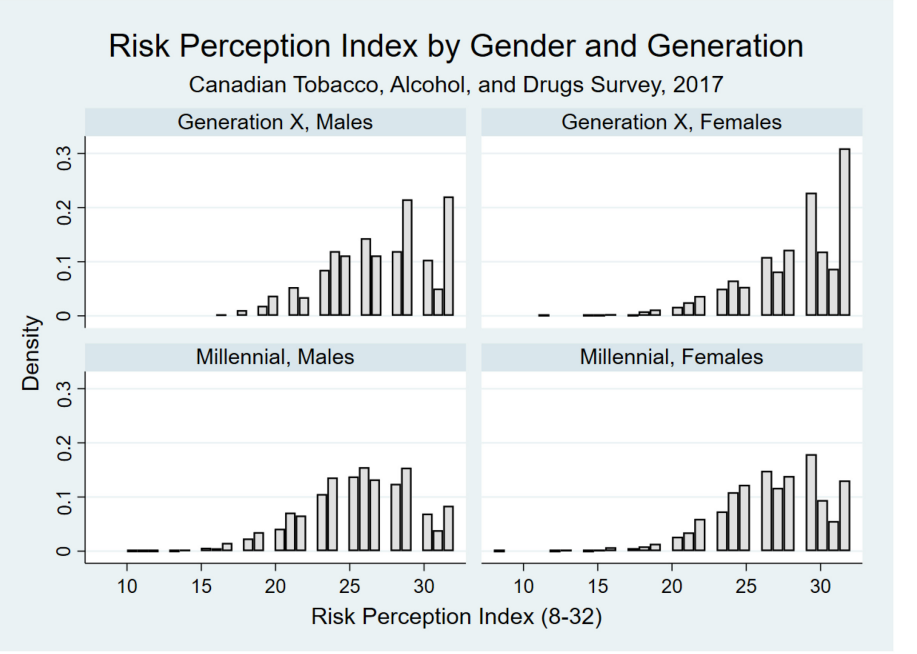

Figure 3.
Risk Perception Index by gender and generation

Note(s): The data are from the Canadian Tobacco, Alcohol, and Drugs Survey of 2017

compared with the less educated (Pampel, 2009). While there is a possibility of bias, most studies of the kind use similarly self-reported indicators (Jürges and Meyer, 2020).

4. Results

The Panel A of Table 2, focusing on males, shows the results of 12 OLS regressions. Columns (1) to (6) use the subsample of Generation X, while columns (7) to (12) use the subsample of millennials. The outcome is a dummy taking the value of 1 for those who have been a daily smoker at one point in their lives (i.e. "ever a daily smoker"). The explanatory variables are sequentially added to the equation to allow the assessment of the channels of impact of education on smoking. Education is nested through three dummies for below high school, 2-years college and university degree, leaving those with a high school education as the omitted category. Those with a bachelor and a graduate degree are pooled under the variable "university", since the youngest millennials in this sample are 22 years of age, quite too young to have a graduate degree. With this coding, bias is unlikely introduced in the results due to the younger age of millennials.

No covariate is used in column (1), except for the three education dummies. Column (2) adds demographic characteristics of marital status and household size. Column (3) adds dummies for Francophones and Aboriginals. Column (4) further includes labour market status, including dummies for employees and the self-employed. Column (5) augments the equation with dummies for province of residence and a dummy for rural areas. Finally, column (6) further includes the Risk Perception Index. The right panel of Table 2a does the same for millennials. The controls are suppressed in all the tables, to save space. The full set of results is available upon request.

Controls	Generation X						Millennials					
	None (1)	+Demo (2)	+Ethnic (3)	+Work (4)	+Locations (5)	+Risk (6)	None (7)	+Demo (8)	+Ethnic (9)	+Work (10)	+Locations (11)	+Risk (12)
(a) Males												
Below high	−0.111	−0.100	−0.102	−0.099	−0.120	−0.126	0.296**	0.301**	0.293**	0.319**	0.335**	0.318**
School	(0.116)	(0.123)	(0.121)	(0.115)	(0.121)	(0.124)	(0.117)	(0.120)	(0.122)	(0.133)	(0.138)	(0.141)
2-Year	−0.091	−0.086	−0.084	−0.080	−0.068	−0.062	0.051	0.038	0.036	0.080	0.079	0.081
College	(0.091)	(0.081)	(0.081)	(0.081)	(0.080)	(0.074)	(0.097)	(0.101)	(0.102)	(0.100)	(0.097)	(0.097)
University	−0.298***	−0.285***	−0.281***	−0.262***	−0.248**	−0.236**	−0.180*	−0.190*	−0.196*	−0.148	−0.148	−0.149
	(0.103)	(0.093)	(0.094)	(0.097)	(0.097)	(0.097)	(0.093)	(0.101)	(0.102)	(0.100)	(0.098)	(0.098)
Obs	942	942	942	942	942	942	1,966	1,966	1,966	1,966	1,966	1,966
R-Squared	0.063	0.110	0.112	0.131	0.145	0.177	0.057	0.063	0.065	0.104	0.110	0.113
(b) Females												
Below high	0.156	0.184	0.180	0.181	0.141	0.142	−0.123	−0.118	−0.203	−0.182	−0.173	−0.151
School	(0.167)	(0.176)	(0.181)	(0.177)	(0.176)	(0.179)	(0.117)	(0.123)	(0.154)	(0.138)	(0.136)	(0.121)
2-Year	−0.160*	−0.134*	−0.136*	−0.144*	−0.148*	−0.148*	0.032	0.006	−0.008	0.010	0.007	0.001
College	(0.083)	(0.079)	(0.079)	(0.076)	(0.078)	(0.077)	(0.111)	(0.103)	(0.102)	(0.094)	(0.094)	(0.093)
University	−0.279***	−0.233***	−0.235***	−0.242***	−0.246***	−0.246***	−0.147	−0.205**	−0.212**	−0.188**	−0.198***	−0.204***
	(0.077)	(0.072)	(0.075)	(0.074)	(0.075)	(0.075)	(0.090)	(0.091)	(0.092)	(0.076)	(0.076)	(0.074)
Obs	1,321	1,321	1,321	1,321	1,321	1,321	2,094	2,094	2,094	2,094	2,094	2,094
R-Squared	0.046	0.084	0.084	0.093	0.109	0.109	0.038	0.095	0.144	0.148	0.158	0.165

Note(s): The data are from the Canadian Tobacco, Alcohol and Drugs Survey of 2017. Standard errors in parentheses; $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. The suppressed controls are as follows: column (2/8): age, age-squared, household size; column (3/9): dummies for Aboriginals and Francophones column (4/10): dummies for self-employed and employee; column (5/11): dummies for province of residence and residence in rural areas; column (6/12): Risk Perception Index

Table 2.
Ever a daily smoker and education

As shown in column (1) of Table 2a, male Generation Xers with a university degree have 29.8 percentage points lower likelihood of having ever been a daily smoker. The other education coefficients are not statistically significant in this column. With the gradual inclusion of controls, this gap generally shrinks, but not to a large extent. As presented in column (6), male Generation Xers with a university degree have 23.6 percentage points lower likelihood of having ever been a daily smoker than others. Not shown in the table, the Risk Perception Index predicts lower odds of smoking with a moderate size. For millennials, as presented in column (7), high school dropouts are 29.6 percentage points more likely to have ever smoked daily, while university graduates are 18.0 percentage points less likely to have ever regularly smoked, compared with high school graduates. Hence, the gap between these two groups is 47.6 percentage points ($29.6 + 18 = 47.6$). This is a much larger zero-order education-related gap than that found among Generation X (29.8 percentage points), and is compatible with a widening of education-smoking gradient.

With the gradual inclusion of the controls, the coefficient for university graduates among millennial males loses its statistical significance. As shown in column (12), when all the controls are included, high school dropout male millennials are 31.8 percentage points more likely to have ever regularly smoked than all others. Hence, regarding the odds of "ever smoking daily", the education-related gap seems to be larger among millennial males (31.8 percentage points higher odds for high school dropouts, shown in column 12) than male Generation Xers (23.6 percentage points lower odds among university graduates, shown in column 6). Not shown in the table, in contrast to the Generation Xers, employee millennials are less likely to "have ever smoked daily" than the self-employed and those who do not work. This might be due to the increasing stigma of smoking in the workplace (Stuber *et al.*, 2008; Reid *et al.*, 2010b; Gagné and Veenstra, 2017; Hernandez *et al.*, 2019). Unlike for male Generation Xers, the Risk Perception Index is not statistically significant for millennial males. Overall, these regressions indicate that for males, the education-related smoking gaps have non-negligibly increased and shifted towards disadvantaging those in a lowest socioeconomic strata, that is, high school dropouts.

Panel B of Table 2 is similar in structure to Panel A; only, it uses the subsample of females. As shown in column (1) of Table 2b, female Generation Xers with a two-year college degree are 16.0 percentage points less likely than those with a high school diploma to have ever smoked. The gap is much larger for those with a university degree, at 27.9 percentage points lower likelihood of ever being a daily smoker. With the gradual inclusion of controls, these gaps generally shrink, but not largely. As presented in column (6), the gap for university graduates remains at 24.6 percentage points lower likelihood of being "ever a daily smoker". This coefficient is very close to that found for males in Panel A (23.6 percentage points). In addition, female Generation Xers with a two-year college degree are 14.8 percentage points less likely than high school graduates and dropouts to have ever smoked. No control is statistically significant for female Generation Xers. For millennial females, as shown in column (7), at the zero-order, there is no education-related gap in "ever a daily smoker" outcome. But, with the inclusion of controls, the coefficient for university graduates gains statistical significance. As shown in column (12), female millennials with a university degree are 20.4 percentage points less likely to have ever smoked on a daily basis than all others. Hence, it appears that among females, the education-related gap in smoking ever in life has slightly shrunk, from Generation X to millennials.

To sum up the findings of Table 2, first, we note that the education-related gaps in the outcome of "having ever smoked daily" have increased from Generation X to millennials among males, while it has slightly decreased among females. Second, we observe that the addition of controls has little effect on the coefficients. This pattern reinforces the belief that the main omitted variables in an equation linking education and health-related outcomes are cognitive ability and family background (Cutler and Lleras-Muney, 2010). Third, among

Generation Xers, almost no gender difference in the association between education and smoking is observed. But, for the millennials, the education-related gap is found to be in the higher odds of smoking among male high school dropouts, while for females, it is in the lower likelihood of having "ever smoked daily" among university graduates.

Panel A of Table 3 only differs from Table 2a in using a dummy for "current daily smoking" as the dependent variable. As shown in column (1) of Table 3a, male Generation Xers with a university degree have a 20.4 percentage points lower likelihood of currently smoking. With the gradual inclusion of controls, this gap rather strongly shrinks. As presented in column (6), a negative gap of 12.9 percentage points remains for those with a university degree. This gap is, however, only weakly statistically significant. As the changes in the coefficients show, the controls have a much greater explanatory power for "current daily smoking" than "ever a daily smoker" (the dependent variable of Table 2). This finding is sensible as the covariates are all contemporaneous, as opposed to retrospective. For millennial males, as shown in column (7), at the zero-order, there is a weakly statistically significant gap, of the size 18.5 percentage points higher likelihood of smoking, among high school dropouts. But, this gap gradually loses its statistical significance. In column (12), where all the controls are accounted for, there is no education-related gap in current smoking among male millennials. Hence, it seems that, as measured by "current smoking" status, the education-smoking gradient has somewhat flattened from Generation X to millennials, among males. Among the controls, the coefficient for Risk Perception Index is found to be statistically significant, negative and of relatively small size.

Panel B of Table 3 only differs from Panel A in restricting the sample to females. As shown in column (1), female Generation Xers with a university degree (two-year college degree) are 24.1 (18.0) percentage points less likely to be presently (i.e. in 2017) a daily smoker. In contrast to males, with the gradual inclusion of controls, these gaps only very slightly shrink. As presented in column (6), female Generation Xers with a university degree (two-year college degree) have a 20.1 (16.5) percentage points lower likelihood of being currently a daily smoker. For millennial females, as shown in column (7), at the zero-order, we find 21.9 percentage points lower likelihood of smoking among the university graduates. This gap remains stable, while the coefficient for high school dropouts gains a weak statistical significance, with a negative coefficient. In column (12), female millennials with a university degree (high school dropouts) have 21.8 (14.1) percentage points lower likelihood of smoking. The finding of a negative coefficient for high school dropouts is interesting, although its statistical significance is borderline. Overall, among females, it looks like that the education-related gaps among women has remained rather stable from Generation X to millennials. To some up, the investigations of Table 3, focused on the probability of being a daily smoker in 2017 (the data collection year), provided no strong evidence for the flattening of the education-smoking gradient for both males and females.

Several robustness tests have been conducted to ensure that the results are not sensitive to the estimation methodology and sample restrictions. First, all the regressions have been re-estimated using probit. These additional regressions show that the conclusions are not sensitive to the estimation methodology. Second, to make sure that the generational differences are robust, those who were born at the generational "cusp", that is, xennials according to some (Taylor, 2018), are excluded. To do so, Generation X has been restricted to years of birth of 1965–1977, and the millennials have been restricted to those born from 1984 to 1995. These restrictions caused very little change to the results. Appendix tables show some of these sensitivity tests. The remainder of the sensitivity tests are available upon request.

5. Discussion and conclusion

The results of this study, examining the education-smoking gradient among Generation X and millennials, can be summarized as follows. First, the education-smoking gradient is

Table 3.
Current daily smoking and education

	Generation X						Millennials					
Controls	None (1)	+Demo (2)	+Ethnic (3)	+Work (4)	+Locations (5)	+Risk (6)	None (7)	+Demo (8)	+Ethnic (9)	+Work (10)	+Locations (11)	+Risk (12)
(a) Males												
Below high	−0.086	−0.087	−0.091	−0.086	−0.112	−0.117	0.185*	0.210**	0.188*	0.184*	0.155	0.117
School	(0.090)	(0.094)	(0.092)	(0.087)	(0.082)	(0.083)	(0.109)	(0.106)	(0.108)	(0.109)	(0.109)	(0.108)
2-Year	−0.114	−0.094	−0.091	−0.076	−0.076	−0.072	−0.015	−0.018	−0.021	−0.020	−0.012	−0.008
College	(0.081)	(0.066)	(0.067)	(0.067)	(0.065)	(0.065)	(0.052)	(0.051)	(0.050)	(0.049)	(0.047)	(0.047)
University	−0.204**	−0.177**	−0.171**	−0.146*	−0.139*	−0.129*	−0.079	−0.071	−0.083*	−0.080*	−0.070	−0.072
	(0.088)	(0.073)	(0.076)	(0.075)	(0.073)	(0.074)	(0.056)	(0.054)	(0.049)	(0.047)	(0.047)	(0.044)
Obs	942	942	942	942	942	942	1,966	1,966	1,966	1,966	1,966	1,966
R-Squared	0.044	0.122	0.126	0.147	0.169	0.201	0.021	0.037	0.056	0.060	0.072	0.111
(b) Females												
Below high	0.213	0.192	0.184	0.185	0.158	0.169	−0.154	−0.139	−0.162*	−0.144	−0.143*	−0.141*
School	(0.201)	(0.186)	(0.184)	(0.193)	(0.194)	(0.202)	(0.100)	(0.097)	(0.096)	(0.091)	(0.081)	(0.074)
2-Year	−0.180**	−0.165**	−0.169**	−0.157**	−0.164**	−0.165**	−0.105	−0.114	−0.116	−0.101	−0.108	−0.108
College	(0.081)	(0.080)	(0.081)	(0.075)	(0.076)	(0.076)	(0.097)	(0.091)	(0.090)	(0.075)	(0.076)	(0.077)
University	−0.241***	−0.210***	−0.216***	−0.201***	−0.204***	−0.201***	−0.219**	−0.231**	−0.231**	−0.210***	−0.218***	−0.218***
	(0.079)	(0.080)	(0.081)	(0.073)	(0.076)	(0.076)	(0.090)	(0.091)	(0.091)	(0.072)	(0.073)	(0.074)
Obs	1,321	1,321	1,321	1,321	1,321	1,321	2,094	2,094	2,094	2,094	2,094	2,094
R-Squared	0.072	0.106	0.107	0.114	0.120	0.125	0.081	0.113	0.130	0.137	0.145	0.145

Note(s): The data are from the Canadian Tobacco, Alcohol and Drugs Survey of 2017. Standard errors in parentheses; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. The suppressed controls are as follows: column (2/8): age, age-squared, household size; columns (3/9): dummies for Aboriginals and Francophones; column (4/10): dummies for self-employed and employee; column (5/11): dummies for province of residence and residence in rural areas; column (6/12): Risk Perception Index

generally confirmed for both generations and genders. Second, if the odds of having "ever smoked daily" is considered as the outcome, for males, the education-smoking gradient has slightly widened from Generation X to millennials. For this outcome, there is also a shift towards a relatively greater smoking prevalence among millennial males with the lowest education level. Third, for females and the outcome of having "ever smoked daily", the education-smoking gradient has only slightly flattened. Fourth, among males, for the outcome of being "currently a daily smoker", there is weak evidence for a flattening of the gradient. In contrast, among females, the gradient has slightly widened. Finally, there is little evidence that the awareness of risks of smoking is the factor that differentiates those with higher education from others. In the lines below, these results are put into the perspective of the past literature, and the policy implications are discussed.

While in the present study, the results have been mixed by gender and smoking status, they overall point to the persistence and even a widening of the smoking-education gradient from Generation X to millennials. To our knowledge, previous studies (Thomas *et al.*, 2008; Pampel, 2009; Reid *et al.*, 2010a, b; Hernandez *et al.*, 2019) did not simultaneously examine current and past smoking status, and account for knowledge of risks. Given the non-negligible possibility of relapse among the past smokers (Cohen and Lichtenstein, 1990; Dai and Leventhal, 2019), the evidence for an increasing disadvantage among those with the lowest education is a matter of concern. Particularly, while the pervasive smoking bans in Canada have reduced the odds of smoking population-wide, they appear to have also widened the education-related smoking gaps. Moreover, surprisingly, the knowledge of risks did not seem to explain away the gaps. This interesting finding suggests that mere informational campaigns may do little in way of smoking reduction. Overall, this situation is concerning, especially in light of the very high cigarette tax rates across Canada, which some argue, have led to a surge in contraband tobacco trade (Guindon *et al.*, 2017). In particular, if those with a lower level of education, hence significantly lower incomes, have remained unable to stay away from smoking at the same rates as more affluent individuals, they may be forced to critically cut back on other expenses, such as food and shelter, to afford smoking. These trade-offs, that is, giving up on healthier food and quality dwellings, are detrimental to health in themselves.

The findings, taken together with the fact that education affects health through channels other than smoking (Arendt, 2005; Conti *et al.*, 2010; Dilmaghani, 2020), suggest that the education-related health inequalities may only aggravate in the future, and as the population ages. Particularly, high school dropout millennials, who were found to have higher odds of smoking, usually end up working in occupations with a high smoking prevalence. Consequently, they will be influenced by adult co-workers who have an established smoking habit (Jürges and Meyer, 2020). Examining the effects of local by-laws in Canada, Carpenter (2009) demonstrates that the benefits of local smoking by-laws are entirely driven by blue-collar workers, generally of lower education. The reason is that white-collar employees usually work in sites with employer-imposed smoking restriction policies. Hence, upstream policy efforts targeting those of lower educational attainment seem both necessary and fruitful.

But, successful implementation of upstream policies remains challenging. As noted in Pampel (2009), there are competing predictions about the effects of upstream policies on the education-smoking gradient. Firstly, higher cigarette prices can be expected to reduce smoking most among those with a lower education, hence lower incomes. Still, the greater resources and higher anti-tobacco motivations of those with higher education grant them advantages which allow them to react to these measures more strongly. Perhaps for these reasons, scholars have often found that income and education disparities have increased as the cigarette prices were raised (Franks *et al.*, 2007; Elis *et al.*, 2007; Pampel, 2009). The disparities uncovered here suggest that upstream policies, especially price increases through excise taxes, have thus far failed to eliminate the smoking gaps associated with

socioeconomic status. In other words, the results showcase the complexity of the education-smoking gradient.

In fact, at a deeper level, education associates with financial means, occupational resources and social capital which help preventing a smoking habit and increase the ability to quit. More educated individuals are also more appreciative of the health benefits of avoiding smoking or quitting. They may also face a lower stress in life, reducing their need to use smoking as a coping mechanism. Finally, they likely have developed a higher self-efficacy and better problem-solving skills, all invaluable resources to smoking cessation efforts (Mirowsky and Ross, 2005, 2015; Pampel, 2009). As Frohlich and Potvin (2008) note, population-wide approaches, which fail to address root causes of higher rates of smoking among individuals of a lower socioeconomic status, are likely to be unsuccessful in flattening the education-smoking gradient. The policymakers, hence, need to identify measures that are tailored to less educated individuals (Elis *et al.*, 2007; Pampel, 2009). As the knowledge of risks of tobacco consumption seems to be of little effect, the findings point to a need for devising innovative policy interventions. More research is required to identify measures which allow policymakers to move beyond already tried upstream policies, towards new and more effective approaches.

Notes

1. For detailed information on the history of Canadian smoking reduction policies, see: https://tinyurl.com/ky6bmxmy
2. For more information on the survey, see: https://tinyurl.com/2jazk5mp

Data and other items

* This paper does not have associated data to submit. The reason is that the data used are collected by Statistics Canada and are confidential. Statistics Canada can grant access to eligible researchers.

* The manuscript has not been previously published and is not under submission elsewhere.

* There is no conflict of interest.

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Appendix

Table A1.
Ordered probit estimations

	Males				Females			
	Generation X		Millennials		Generation X		Millennials	
Controls	Smoker ever (1)	Smoker now (2)	Smoker ever (3)	Smoker now (4)	Smoker ever (5)	Smoker now (6)	Smoker ever (7)	Smoker now (8)
Below High	−0.139	−0.077**	0.315**	0.063	0.153	0.081	−0.106	−0.026*
School	(0.119)	(0.039)	(0.145)	(0.080)	(0.199)	(0.143)	(0.075)	(0.014)
2-Year	−0.073	−0.053	0.080	−0.021	−0.140*	−0.109**	−0.007	−0.030
College	(0.079)	(0.046)	(0.095)	(0.034)	(0.072)	(0.043)	(0.079)	(0.019)
University	−0.257***	−0.104*	−0.174*	−0.081**	−0.238***	−0.138***	−0.228***	−0.145***
	(0.096)	(0.059)	(0.096)	(0.032)	(0.067)	(0.041)	(0.070)	(0.041)
Obs	942	942	1,966	1,966	1,321	1,321	2,094	2,094
Pseudo R^2	0.141	0.211	0.096	0.145	0.087	0.155	0.158	0.245

Note(s): The data source is the Canadian Tobacco, Alcohol and Drugs Survey of 2017. Standard errors in parentheses; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. The full set of controls is employed at once, in all the columns. But the controls are suppressed to save space. The controls are age, age squared, dummy for partnered, household size; dummies for Francophones and Aboriginals; dummies for employee and self-employed; dummies for province of residence, dummy for residence in rural areas and the Risk Perception Index

Table A2.
Estimations excluding xennials

	Males				Females			
	Generation X		Millennials		Generation X		Millennials	
Controls	Smoker ever (1)	Smoker now (2)	Smoker ever (3)	Smoker now (4)	Smoker ever (5)	Smoker now (6)	Smoker ever (7)	Smoker now (8)
Below High	−0.102	−0.149*	0.393***	0.155	−0.016	−0.072	−0.088	−0.133
School	(0.133)	(0.089)	(0.130)	(0.110)	(0.160)	(0.157)	(0.137)	(0.103)
2-Year	−0.064	−0.106	0.093	−0.037	−0.146*	−0.208**	−0.161**	−0.128
College	(0.077)	(0.064)	(0.092)	(0.047)	(0.084)	(0.080)	(0.079)	(0.081)
University	−0.196*	−0.109	−0.068	−0.089*	−0.242***	−0.217***	−0.249***	−0.249***
	(0.099)	(0.087)	(0.093)	(0.049)	(0.076)	(0.082)	(0.079)	(0.079)
Obs	821	821	1,838	1,838	1,174	1,174	1,910	1,910
Pseudo R^2	0.199	0.241	0.179	0.127	0.126	0.150	0.180	0.207

Note(s): The data source is the Canadian Tobacco, Alcohol and Drugs Survey of 2017. Standard errors in parentheses; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. The full set of controls is employed at once, in all the columns. But, the controls are suppressed to save space. The controls are age, age squared, dummy for partnered, household size; dummies for Francophones and Aboriginals; dummies for employee and self-employed; dummies for province of residence, dummy for residence in rural areas and the Risk Perception Index

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Tackling student drinking within the drinking subculture of a university sports competition: a culture change approach

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Abstract

Purpose – This paper explores the impact of a suite of alcohol culture change interventions implemented by Deakin University in Melbourne, Australia. The interventions were designed to change the alcohol culture at a bi-annual nation-wide university multi-sport competition known as Uni Nationals. This study aims to understand the critical success factors of the alcohol culture change initiatives that were developed by the university and implemented as part of a broader set of institutional practices.

Design/methodology/approach – A qualitative research design utilised in-depth, semi-structured interviews with nine Uni Nationals student team leaders. In total, two group interviews and four individual interviews were conducted with student team leaders who participated in the Uni Nationals. The interview transcripts were coded and themed. The themes were further refined and interpreted into a narrative. A total of two transcripts were independently coded by the first two authors. Discordant coding was flagged and discussed until a consensus was achieved. The remaining interviews were coded by the first author and discussed with the second author to ensure consistency. A socio-ecological framework was used to understand perceived changes to alcohol culture.

Findings – Student leaders were aware of and felt supported by the university-wide approach to changing the culture of Uni Nationals. Overall, the qualitative study indicated that students were positive about the alcohol culture change interventions. The leadership training that engaged team leaders in interactive activities had the greatest impact. Student leaders found the targeted messages, mocktail events and Chef de Mission (CdM) less effective cultural change strategies. However, they helped to establish expectations of students in this setting where a heightened focus on sport was associated with higher alcohol consumption.

Originality/value – While there has been growing academic interest in exploring "drinking cultures", there has been relatively little focus on alcohol culture of university students at sporting events. The paper contributes to addressing this gap by shedding light on the impact of a group of interventions on the drinking culture of the Uni Nationals subculture.

Keywords Alcohol culture change, Drinking culture, University student alcohol initiatives, Peer influence, Social norms, Peer interventions

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Introduction

University and residential college students in Australia and comparable countries engage in a high incidence of heavy and/or frequent drinking, compared to their non-college peers (Leontini *et al.*, 2015). Further, some studies have suggested that college students participating in intercollegiate athletics drink more than other students (Martens *et al.*, 2011; Marzell *et al.*, 2015; Zhou *et al.*, 2013) and have elevated problematic alcohol involvement (Cadigan *et al.*, 2013; Partington *et al.*, 2013).

Risky drinking behaviour and outcomes in sporting subcultures

Alcohol has been reported to have an important role in sporting subcultures as a coping mechanism for sports-related stress, as positive reinforcement for athletic performance and as a team bonding activity (Martens and Martin, 2010). Sporting team cohesion and happiness are also significant predictors of alcohol consumption, and the relationship between happiness and alcohol consumption is mediated by the importance of drinking for team cohesion (Zhou *et al.*, 2013). In a strongly identifying sporting nation like Australia, alcohol consumption is an important element of post-game celebrations and is associated with the general culture of being part of a sports team (O'Brien *et al.*, 2010).

Those participating in university sport experience a multitude of adverse outcomes due to their drinking, including poor academic performance, higher rates of college drop-out and employment difficulties after graduation (Bamberger *et al.*, 2018; Hermens and Lagopoulos, 2018). Risky drinking practices are also known to increase alcohol-related harms, such as physical and sexual assault, unsafe sexual relations, interpersonal conflicts and health problems such as hangovers, blackouts and injury (Kypri *et al.*, 2009; White and Hingson, 2013), drink-driving and alcohol dependence (Wicki *et al.*, 2010). Consequently, there has been considerable research into a range of approaches to reduce higher levels of alcohol use and associated harms in the university sector.

Approaches to reduce risky drinking in the university sector

Social norms. A large literature base on the influence of social norms focuses on the normative power of peers in shaping what individuals perceive as typical or normal behaviour in the university setting (Angosta *et al.*, 2019; Gächter *et al.*, 2012; Thöni and Gächter, 2015) and among college student-athletes more specifically (Olthius *et al.*, 2011). Savic *et al.* (2016) suggest that group norms about drinking and associated behaviour are often a part of the normative structure of the subculture or social world of university students. Norms can act not only as mechanisms to limit behaviour but also to encourage particular behaviours, including that of university students (e.g. norms about buying rounds of drinks and celebrating after sporting team success) (Savic *et al.*, 2016, p. 275). Ahern *et al.* (2008, p. 1,042) noted that "group norms may be particularly important in relation to binge drinking because theories suggest that there are norms or aspects of the 'culture of drinking' that separately determine levels of any drinking".

Social–ecological approach. While the literature identifies that group norms influence individual drinking behaviour Savic *et al.* (2016), a social–ecological approach recognises that individuals are embedded within larger social systems and describes the interactive characteristics of individuals and environments that underlie health outcomes (Golden and Earp, 2012). These larger social systems contain multiple levels of social and cultural influence that interact to both shape and be shaped by the social environment (Sudhinaraset *et al.*, 2016). These include individual, interpersonal, organisational, community and public policy influences (Glantz and Bishop, 2010; Sudhinaraset *et al.*, 2016). Within each area of influence, there are subcultures or subgroups operating. Savic *et al.* (2016, p. 278) define a subculture or subgroup as a relatively holistic cultural entity, which often provides a "master

identity" for members who participate in the group. Social cultural theories of alcohol use focus on the roles that drinking contexts or subcultures play in the use of alcohol (Gruenewald *et al.*, 2014). There are subtle, hidden and unspoken ways in which individuals influence their peers to drink and also discreetly slow down a friend's drinking (Roberts *et al.*, 2019). Drinking at university sporting events is affected by drinkers' opportunities to drink in these environments and their use of these environments for drinking (Gruenewald *et al.*, 2014).

Drinking cultures

A social–ecological approach intervenes in the drinking cultures of a subgroup. There has been increasing interest in research into "drinking cultures", driven often by policy discourse about "changing the drinking culture" (Savic *et al.*, 2016, p. 270). This work complements other efforts targeting individuals and the population as a whole that aim to prevent and reduce alcohol-related harm. Savic defines drinking culture as

> . . .the norms around patterns, practices, use-values, settings and occasions in relation to alcohol and alcohol problems that operate and are enforced (to varying degrees) in a society (macro-level) or in a subgroup within society (micro-level). Drinking culture also refers to the modes of social control that are employed to enforce norms and practices. As part of a network of other interacting factors, drinking culture is thought to influence when, where, why and how people drink, how much they drink, their expectations about the effects of different amounts of alcohol, and the behaviours they engage in before, during and after drinking. (Savic *et al.*, 2016)

This definition of drinking culture indicates that cultural and social influences affect behaviour and place individual alcohol use within the contexts and environments where people live and interact (Glantz and Bishop, 2010). Therefore, an alcohol culture change approach seeks to intervene in the social world or subculture of students where risky drinking is commonplace. Interventions influence and help transform drinking norms, expectations and practices (e.g. types of drinks consumed or consuming water in between alcohol drinks), so that, if drinking is continued, it becomes less risky (VicHealth, 2019a, b).

d'Abbs (2014) reminds us there may be variations in drinking cultures, which reflect variations in norms about drinking between different subgroups in the population. Therefore, there is a need to explore how "drinking culture manifests in relation to other actors, use-values, practices and settings, in a given local situation", which necessitates the need to examine drinking cultures from the micro- or subculture level (Savic *et al.*, 2016, p. 276). Therefore, when considering a university student's alcohol use within a socio-ecological context, we must conceptualise it as a combination of students' group practices, identities, attitudes and social networks related to alcohol use, independent of other social forces (see, e.g. Savic *et al.*, 2016; Tan, 2012).

To gain an understanding of the specific character of these drinking practices, attitudes and social networks in an Australian university sporting subculture, we drew on the interpersonal, community and organisational levels of a social–ecological approach. At the interpersonal level, influences of perceived social norms on drinking behaviour are strengthened when there is greater identification with the normative sporting community or group (Angosta *et al.*, 2019; Leontini *et al.*, 2017; Neighbors *et al.*, 2010). At the organisational level, universities have an important role to play in creating healthy study environments including shaping the use of alcohol among students (Cremeens-Matthews, and Chaney, 2016; Leontini *et al.*, 2015, 2017). University processes and management related to drinking are integral to the making of the university drinking culture (Leontini *et al.*, 2017). Further, Zhou *et al.* (2013) assert that coaches and team leaders, as well as university athletics departments, need to be engaged with the development and implementation of interventions to reduce drinking while maintaining the positive elements and outcomes of sport participation.

The culture change literature, including findings of a study by Zhou *et al.* (2013), call for novel strategies that employ ways of creating cohesion and maintaining a sense of collectiveness, belonging and well-being, without the involvement of alcohol and drinking practices. A social–ecological framework is useful to identify and cluster effective intervention strategies to positively impact on normative beliefs and alcohol culture within university sporting teams (Connell *et al.*, 2010; Williams *et al.*, 2008).

The initiative

In 2018, a steering group that included members of the Health and Social Development and Psychology faculties of Deakin University, the Deakin University Student Association (DUSA), residential services, campus services and team leaders were engaged in the development and implementation of interventions to reduce harmful drinking. A systematic needs assessment was undertaken to build an authentic understanding of culture and to guide development of appropriate interventions. This process included a literature review, qualitative interviews with a range of students, a university-wide student survey and consultations with academic and professional university staff, including DUSA. The student surveys and interviews identified student groups that represented university subcultures with risky drinking practices, motivations behind drinking culture and views about effective strategies for influencing culture change. Uni Nationals participants (nation-wide extra-curricular university sporting competition) were one subculture and are the focus of this research.

Uni Nationals provides an opportunity for students at universities from across Australia to compete in various national standard sporting competitions. Each university is housed separately, so when not competing students socialise with their own university peers. This subculture has long-standing traditions and norms in relation to alcohol and social networks.

The academic literature about culture change, normative behaviour, effective interventions and social–ecological theory informed our understanding of the elements that would successfully impact on drinking cultures for this subgroup. These were considered part of a broader set of institutional practices designed to shift the alcohol-related traditions and cultures to reduce harms. Strategies were aimed at shaping students' understanding of and behaviour around alcohol culture through a multi-faceted, co-design approach. Alcohol education and leadership training were provided to Uni Nationals sporting team leaders to promote the culture change approach and empower them to work with members of their teams to change attitudes and reduce risky drinking. A selection of targeted messages were co-designed with students to present throughout the Uni Nationals competition. A mocktail making and naming competition provided a fun opportunity for creating appealing non-alcohol-based beverages. A Deakin alumna and elite sporting role model was also engaged to act as the Chef de Mission (CdM) at the Uni Nationals to motivate athletes to compete at their best.

The purpose of this study was to understand the impacts of a culture change approach within a university subculture, including the critical success factors and areas for refinement. In particular, it was concerned with a socio-ecological approach and how the physical and social environments might positively influence drinking culture and reduce the risk of harm amongst the Uni Nationals subculture. By examining the insights of a select group of Uni Nationals student leaders about the change initiatives implemented at Uni Nationals, we begin to understand how an alcohol culture approach that acknowledges the multiple and multifaceted nature of drinking cultures at both macro- and micro-levels might begin to change behaviour (Savic *et al.*, 2016).

Method

Here, we report findings from the qualitative, semi-structured interviews with Uni Nationals team leaders who were part of a larger mixed-methods analysis of an alcohol culture change initiative conducted in 2018 with Deakin University students. Other quantitative data collection methods were used, including university-wide pre- and post-surveys; however, these are not reported in this article.

The interventions

Alcohol education training for team leaders. The training content was developed in conjunction with the project team, the steering committee, DUSA, residential services staff and other experts. The training was delivered by an expert facilitator to Uni Nationals sporting team leaders. It aimed to promote the culture change approach and empower team leaders to work with members of their teams to change attitudes and reduce risky drinking. The 120-min training session incorporated a range of interactive activities designed to raise a student leader's awareness about alcohol consumption guidelines and standard drinks. It was also designed to build skills and assist student leaders to develop and implement practical strategies with Uni Nationals students. These aimed to reduce the risk of alcohol-related harm, to help them respond to difficult situations and to foster positive role modelling.

A selection of targeted messages. In total, four targeted messages with sporting-themed images and slogans that included *be ready, be strong, be your best* aimed to reduce risky drinking behaviours. They were developed and implemented with Uni Nationals participants as part of a poster and social media campaign to promote strong sporting performance by reducing risky drinking prior to during and after competition. These messages were co-designed with Deakin University "Design and Collaboration" students. The "Design and Collaboration" students participated in a workshop where they were provided with some guidelines to help create evidence informed designs; words and images. This approach included promoting harm minimisation, challenging the social acceptability of drinking and highlighting the positive aspects of drinking less. To ensure the messages resonated with the target audience, they were tested with Uni Nationals students by asking them what the messages made them think, how they made them feel and what action they felt they should take.

A mocktail making and naming competition. The mocktail creating event was held on the first night of Uni Nationals, and due to its popularity and the positive anecdotal feedback, a second mocktail event was implemented. Students designed, produced and named mocktails as a team building event. A range of ingredients were provided to enable students to produce appealing non-alcohol-based beverages. Additionally, the two winning mocktail recipes were served at the formal dinner held on the last night of the Uni Nationals competition.

Chef de mission. A Deakin alumna and elite sporting role model was engaged to act as the CdM at the Uni Nationals to motivate athletes to compete at their best. The CdM was required to provide advice, motivational interviewing about drinking behaviours and personalised normative feedback where appropriate. The CdM engaged with student athletes by attending Uni Nationals competitions and social events and addressing students at their briefing session.

Data collection

Semi-structured, open-ended individual and small group interviews were conducted shortly after completion of the Uni Nationals competition with nine Uni Nationals team leaders. In total, four students were interviewed individually, by telephone or in person, and five students were interviewed in small groups, one with three participants and the other with two participants. Semi-structured interviewing with individual and small groups is best used

when asking "probing, open-ended questions and want to know the independent thoughts of each individual" (Adams, 2015, p. 493). Small group interviews can sometimes add richer information than conducting individual interviews with the same number of participants because members respond to the ideas and themes raised in the group thereby illuminating conflicting opinions (Bolderston, 2012). The interviews lasted approximately one hour and aimed to elicit rich and in-depth data (Guest *et al.*, 2013). The authors used the interviews to better understand student leaders' views about the effectiveness of the interventions in the Uni Nationals subculture, including how they could be improved or refined, their relevance to students lives and the circumstances surrounding their implementation.

A loose, schematic interview guide of important questions was developed (McGrath *et al.*, 2019). It was designed by members of the research team on the basis of ideas and issues emerging from a needs assessment and other evaluation methods used in the study. The interviews were conducted by the first and second named authors who followed the same process, interview structure and script. The interviews were recorded digitally and transcribed verbatim. Within the eighth and ninth interviews, no new themes emerged, indicating saturation of the data.

Recruitment

All Uni National student leaders ($n = 18$) were invited to participate in an interview during the Uni Nationals competition and via social media. Those who expressed interest in participating ($n = 9$) were emailed a plain language statement and consent form and provided with further explanation prior to the beginning of the interview. Signed consent was obtained from participants before interview times were established to indicate they were informed about the research and agreed to participate and have their interview audio recorded.

Sample

The sample consisted of student team leaders that had been involved in the implementation of a range of alcohol culture change interventions at Uni Nationals. In total, 18 students completed the leadership training and equal numbers were male and female. A total of nine students (six females, three males) volunteered to be interviewed. While we were planning to interview more students, we felt that we had gained an in-depth understanding of the experiences of those students who were interviewed. Qualitative research is traditionally concerned with "understanding the interviewee's subjective perspective of a phenomenon rather than generating generalizable understanding of large groups of people" (McGrath *et al.*, p. 1,002). Most scholars argue that the concept of saturation is the most important factor to consider in relation to sample size decisions in qualitative research (Mason, 2010). Saturation is defined by many authors as the point at which the data collection process no longer offers any new or relevant data (Saunders *et al.*, 2018).

Ethics

Ethics approval was received through the Deakin University Human Ethics Advisory Group. The approval number is HEAG-H 126_2017: Understanding the roles that culture and setting have in alcohol consumption.

Analysis

Key themes from semi-structured interviews were identified and analysed. A rigorous thematic analysis can produce trustworthy and insightful findings (Nowell *et al.*, 2017). Thematic analysis was chosen to elicit student views and experiences in relation to alcohol

culture at the Uni Nationals. Nowell *et al.* (2017) argued that thematic analysis is a useful method for examining the perspectives of different research participants, highlighting similarities and differences and generating unanticipated insights. Thematic analysis involved coding and closely examining the data to identify broad themes and patterns. An inductive approach allowed the data to determine the themes (Nowell *et al.*, 2017). Data analysis proceeded in several closely linked stages as follows: familiarisation with the data by rereading transcripts; identification of recurrent or important topics/comments; coding data on transcripts; coalescing of related topics into themes; constant comparison of the data; further collapsing/refinement of categories; interpretation of analysis into a narrative (Ranney *et al.*, 2015).

As a preliminary step in the analysis, two members of the research team independently coded two transcripts and generated codes. Discordant coding was flagged and discussed until a consensus was achieved. The remaining interviews were coded by the first author and discussed with the second author to ensure consistency. These were further reviewed and refined during project meetings.

Findings

We report on the themes within the specific culture change interventions undertaken with student leaders engaged in the Uni Nationals.

Awareness of the culture change strategy

Details of the culture change interventions were communicated by DUSA staff to student leaders prior to the games using a number of forums including the leadership training. Team leaders indicated they were aware of the Deakin University culture change approach and made particular reference to efforts to create a stronger focus on sporting performance and leadership training:

> Yeah, just the culture from when I first started going to when I go now; it's dramatically different and I think that's partly because Uni Sport and Deakin and the University as a whole is trying to change the culture of how it's going and I think it's working slowly. (Male, 181019 UN, lines 500–03)

Uni Nationals student leaders were overwhelmingly positive about the culture of these Uni National games compared to past games. At previous games, alcohol use was anticipated and played a key role each day, particularly after competition. While we accept d'Abbs (2014, p. 4) point that drinking cultures are changing "sociological entities" that are continuously being renegotiated, Uni Nationals student team leaders referred to the change in the culture of the games in static terms. One team leader noted, "I think the general culture of the games personally encouraged people" (Male, 181010 UN, lines 24–5). Most students believed the culture change strategies helped to improve their overall experience:

> But there has been a decline over the years. And personally, I did love it this year; it was my favourite of all because of the decline. And I think the accommodation and where we are and all of that sort of stuff is really important. (Female A, 1818026, lines 684–86)

In total, three Uni Nationals student leaders referred to Deakin University expectations, which were understood to mean that opportunities for alcohol consumption would be limited and students were expected to consume less alcohol at the games. Evident in this request was the broader discourse related to reducing the risk of harm associated with alcohol use at the games. This strategy utilised the power of interpersonal relationships as the primary influence on drinking among university athletes (Williams *et al.*, 2008). Student leaders became the managers of the team's rights and responsibilities in relation to alcohol use. However, being able to refer to Deakin University's expectations offered leaders a way to

enact some positive change in relation to the team's alcohol consumption. It gave some weight to their requests to team members to moderate their drinking and also afforded them some protection from taking responsibility for the decisions:

> I'd make it clear at a sort of a group conversation what our expectations were for the week and where alcohol would sit in the expectations. And we'd all sort of talked about what we expected of ourselves and what Deakin expected of us and how we'd go about that. (Male A, 181010, lines 74–78)

There was a belief that this would translate into better sporting performances. All Uni Nationals student leaders interviewed acknowledged the greater focus placed on performing at their sporting best as part of the culture change approach. They observed that this stronger emphasis on performance provided an effective way to shift the focus away from alcohol. It was believed this focus resulted in far fewer students drinking during the evenings prior to performing:

> Well, yeah, it's supposed to be a nationally recognised sporting comp so I do not think it should be known as a big party like it used to be and I think it's slowly becoming that and people are realising that it's not going to be about the party as much. (Male, 181019, lines 506–9)

While the approach was seen to be effective for many, two team leaders commented that despite the efforts to communicate a change with regard to alcohol culture, some Uni Nationals participants still expected an opportunity to consume large amounts of alcohol at the games.

> There was a team at the games that was not there to win at all and they were just there for the party and I think that everyone saw that they were just there for the party and by the end of it, no one really enjoyed how they were conducting themselves. (Male, 181019, lines 522–25)

Uni Nationals afforded students who consumed a large amount of alcohol a social identity. The social aspect of participation was just as important to them, if not more important, than the athletic aspects. This is supported by Leontini *et al.* (2015) who found that not only are sport and intercollege competitions popular ways to socialise, the competitiveness of sport and team membership are traditionally celebrated through heavy drinking and associated partying/festivities.

Leadership training

Participants had undertaken leadership training developed and provided by the DUSA and the researchers. This was part of the organisational support for student leaders to manage the culture change approach at the Uni Nationals competition. Drawing on the organisational and interpersonal elements of the social–ecological model for college athletes (Williams *et al.*, 2008), leaders were seen as an important influence on culture and hence drinking behaviours of student athletes. The leadership training was designed to empower student leaders by upskilling and building their confidence to work with students to assist them to make better decisions in relation to risky drinking behaviours. This was achieved through activities such as the standard drink activity that aimed to increase knowledge and scenario rehearsal and role play that provided opportunities to build communication strategies to deal with relevant alcohol related situations. Some leaders found it beneficial to have the opportunity to act out scenarios and rehearse these skills:

> So, I think the best part about it was the scenarios because at uni when you're in lectures and stuff, nothing really. . .makes sense to an extent but once you're actually subject to that in the real world then you learn a lot more. So, going through your scenarios and stuff like that of, "What would you do?" And scenarios that you have no idea what could happen. That was good. (Male, 181019, lines 30–34)

In total, two students indicated that training helped them approach conversations with others about drinking less. As one student pointed out, *I think it just gave me better background understanding on how to approach conversations* (Female, 181015, 22–23). A study by Pitt *et al.* (2018) found knowledge can increase the self-efficacy of coaches in managing the environment for alcohol on their teams, including understanding how their leadership styles, attitudes and behaviours contribute to athlete alcohol use and culture. While not coaches *per se*, the student team leaders provided the team with mentorship and guidance. Team leaders also found it was easier having those conversations after leadership training where they had the opportunity to practice their communication skills. Students however were clear that it was easier and likely to be more effective with their own team members because they were more familiar with them and felt a greater sense of responsibility for them:

> This time around it was a little bit easier because I had a smaller group to deal with instead of 20 odd people. . .and I knew everyone, so I could just say no or stop and they would listen. But I think it might be a little bit different if I had a bigger group or if it was people that I did not know well. But I know these people and it's easier to speak to them and say no. (Female A, 181026, 49–54)

In response to a question about the impact of the standard drink training activity on their alcohol consumption, the participants generally reported an increased awareness of the role alcohol plays in their lives, "*Yes, I think because that training actually opened my eyes up to it a little bit more"* (Female A, 181026, lines 154–5). Further, there was an attempt by some to use this knowledge to reduce their alcohol consumption:

> Probably just being a bit more aware of pre-drinking and how much when you're pouring drinks. . .you know there can be stronger ones and weaker ones, but just how much can sneak in there for each one. Trying to keep an eye on top of that. (Female, 181022, 178–181)

In total, two team leaders did not credit the training with helping them to develop the skills to either identify or appropriately talk to someone who had too much to drink. This was due to the fact they already felt prepared to have those conversations:

> I did not think there was anything that could have been shown to me that would help me change how people were drinking. (Female 3, 181026, lines 210–11).

Some team leaders had a large team to manage at Uni Nationals, which prevented them from having a conversation with those who had too much to drink when it may have been necessary. There was a suggestion that having a greater number of team managers appointed in the future would make the role more effective.

One person reported they did not feel they could impact on the drinking of others:

> I do not think you have that much influence over other people and what they're going to do unless the whole team says, "Look, we're not going to drink this night," but I do not think that's very likely to happen. (Male, 181010, 83–85)

As part of the discussion on the role of the leaders training and their ability to influence others, some leaders believed that peer influence did not play a role in their choice to drink or the drinking of others. Most leaders believed their drinking practices were self-determined:

> But with only having eight people, you know, we're just friends. And we can all just sit around a table and we can eat or we can – you know, if we wanted a drink, we can have a drink. But it was never like here's 10 drinks, you know what I mean? (Female A, 181026, 626–28)

Targeted messages

The targeted messages were co-designed with students as part of their coursework and aimed to promote that limiting alcohol can improve sporting performance. The messages were

tailored, prominent and interchanged in a short space of time. All students recollected seeing the messages. Some said they could not remember the exact wording, however were able to recount the general message or theme behind the message:

> I can remember the one slowly breaking out of the bottle. I cannot remember exactly the tag lines for each of them. But slowly building on like, not letting alcohol hold you back and being your best, all that sort of stuff. (Female, 181022, 246–49)

Those who liked the messages thought they were engaging and subtle. Giving attention to a healthy sporting culture resonated with these students and they commented on the relevance of these taglines that focussed on positive messages rather than on the harms of alcohol. However, they acknowledged the importance of continuing the messages beyond one or two games as reminders of the importance of a healthy sporting lifestyle. When asked what aspects of the targeted messages made them effective, one student leader indicated that

> I think the "Stay on your game," sort of thing, the taglines, and "Be your best always," it's not just enough to do it for one or two games, you've got to go all the way through. But again, as I just mentioned, the whole–it does not even really mention alcohol. It's just the bottles. You make the association yourself. It's not trying to push the party line on to you. It's kind of like, you are adults, it's your decision, just food for thought, keep this in mind. (Female, 181022, 324–329)

This indicated that student leaders felt that depicting positive sporting messages rather than intoxicated people resonated with them, normalised being active and generated conversation:

> The posters and stuff, it was a talking point. People walked down and were like, "Oh, it's a different poster." It's not like we all sat down, "Okay, this is why we do not drink," it was a comment made, and then people were probably thinking about it a little bit as they were moving on. (Female, 181022, lines 578–581)

That said, the impact of the messages on the behaviour of the broader Uni Nationals student population was less clear. This could be because some students already saw themselves as reasonably moderate drinkers and focussed on their sport. Some students may have expectations around alcohol use at Uni Nationals such that most strategies would be ineffective. This suggests that even though these students thought the posters were relevant, they had a more passive engagement with them. This aligns with research by Moss *et al.* (2017) that indicates while responsible drinking messages may have some beneficial effects in terms of creating more negative attitudes towards alcohol consumption, passive engagement with posters may have differential effects on perceptions of alcohol use:

> I think they are generally relevant. I think [everyone wants to] be ready, be strong, be your best. Everyone wants that. So, they are relevant to any sporting environment. . . . but I do not think that they were influenced by them. (Male A, 181010, lines 146–48)

Mocktail creating events

Uni Nationals participants had access to two mocktail creating events and were served a free mocktail at the group dinner on the final night of competition. The mocktail events were considered by students to be enjoyable and engaging and promoted an alternative to consuming alcohol. They were also considered to promote social interaction. This is an important finding given that sport and team membership are traditionally celebrated through heavy drinking at social gatherings (Leontini *et al.*, 2015).

> And it was a good way to promote non-drinking and getting other people inspired to use their own ideas and get creative and get to meet other people that they probably would not have gotten to know otherwise. (Female 2, 181026, lines 424–26)

They enjoyed the competition surrounding the mocktail creation. As one student said, "Being competitive, with the competition, we were like, yeah we want to make a good one" (Female, 181022, lines 380–381). Teams used the mocktail making and naming event as a team bonding exercise:

> But I think the girls enjoyed it. We were joking about it, and I think we nicknamed ours "Crazy catch" or something, and it kept coming up as a tagline throughout the week. I think it was a good little workshop to do. (Female, 181022, lines 341–43)

Despite indications that alcohol-free events may be associated with a reduction in drinking (Patrick *et al.*, 2011), and that some student leaders believed that providing alternatives reduced their drinking, three students indicated they had no impact on their alcohol consumption or that of their peers:

> For me, the idea I think is really good. And I think that it will impact people who are maybe on the fence about drinking. But I know that in our team all the people that wanted to drink, they were just like, Ph! I do not want a mocktail. (Female 3, 181026, lines 444–446)

Further, there was a sense that the timing of the mocktail making competition was not the most appropriate and a little rushed, which may have impacted on its effectiveness:

> But I think maybe doing it late at night when you're probably going to do pre's [pre-drinks] and stuff before you go out would be pretty interesting. Then, it would be directly influencing the time that you would do your pre's [pre-drinks]. (Male, 181019, lines 322–324)

Chef de mission

A former elite athlete living locally to the competition was engaged to help create a sporting focus by having conversations with students throughout the tournament about culture and the negative impact alcohol can play on performance. Drawing on social–ecological theory, learning and behaviour are enhanced when students can observe and emulate the thinking and actions of expert role models (Horsburgh and Ippolito, 2018). Overall, the CdM helped to shift the culture at the Uni Nationals to previous years. Students generally felt inspired by her and regarded her as having a positive impact on their sporting performance:

> Because when you have a person of her calibre around there you definitely expect to perform better. When she's at your games you probably want to show your best out there. (Female, 181022, 303–305)

Students were aware that refraining from drinking alcohol would help them achieve their sporting best, and for some it was the elevation of the sporting influence of the CdM that had an indirect impact on their alcohol consumption:

> I think she did influence people to drink less, not through telling people to drink less, I think what was really effective about the CdM was that it bolstered the sporting aspect and bashed the alcohol aspect. So, I think that was really effective because it gave everyone another focus. . .I think taking the focus off alcohol and being like sport's really great, we have this amazing athlete here, you're all amazing athletes. I think that was a good way to go. (Male, 181010, 272–278)

While the CdM was received positively, the conversations students had with her were not related to alcohol. In total, two students felt the CdM was part of a package of initiatives that had an impact on alcohol consumption, however was not effective on its own:

> Probably not the direct effect of [the CdM's] presence. More just the whole of this uni nationals. . . wanting to perform better. It was the whole approach of it all, as opposed to [the CdM], "Yeah, I do not want to drink," if that makes sense? (Female, 181022, 534–36)

One student felt the CdM's reference to alcohol did not have the desired impact. This appeared to relate to a perception that the elite athlete's world was different from theirs, and as a consequence, the student distanced herself from the messages:

> I remember her mentioning in her training schedule how she stopped drinking alcohol, and I specifically remember her saying she was like, "Yeah, my best friend even got married that year, and I did not even toast. Didn't drink at all,". . . So, it's kind of that–there could potentially be a bit of a disconnect in the sense that people would be like, "That's great and all, I completely get that for an elite athlete. . .I do not think she was trying to say, "Go give up all this for a year," but I think people were just like, "Yeah, it will not affect me because I'm not at that level. (Female, 181022, 518–524)

Discussion

Prior studies indicate that college student–athletes have higher rates of alcohol use than others (Massengale *et al.*, 2017; Thrul and Kuntsche, 2016). Further, these studies found that excessive drinking traditionally forms part of a rich student experience to facilitate friendships, establish group belonging, celebrate wins, commiserate losses and strengthen a team identity (Cadigan *et al.*, 2013; Marzell *et al.*, 2015; Massengale *et al.*, 2017). Uni National team leaders frequently referred to the levels of intoxication they had experienced at previous Uni Nationals and the concerns they had in relation to player safety. Excessive drinking was seen as part of the identity of the Uni Nationals, and leaders acknowledged concerns about the impact of alcohol on injury and team performance at previous games. These impacts are consistent with previous research that found college athletes are more likely than non-athletes to experience alcohol-related problems such as being hurt or injured while drinking or as a result of drinking excessively (Cadigan *et al.*, 2013; Pitts *et al.*, 2018).

Despite this evidence, minimal research exists on how to influence the subculture to reduce student alcohol consumption. This study drew on the alcohol culture change literature and a social–ecological framework to develop and implement a number of initiatives to positively influence alcohol culture among university students. Targeted initiatives were selected that acknowledge there are multiple levels of influence on a subculture that are interactive and reinforcing (Golden and Earp, 2012).

Consistent with a social–ecological approach, this study found that it is beneficial to develop initiatives to influence students at the individual, interpersonal, organisational and subculture community levels (Bronfenbrenner, 1994; Sudhinaraset *et al.*, 2016). While Williams *et al.* (2008) found intrapersonal and interpersonal levels were the primary influence on drinking among college athletes, this study also confirmed the importance of the organisational level of influence. In this study, we found that is important to adopt a university-wide approach to preventing and reducing alcohol related harm. The partnership between the DUSA and the broader university to develop and implement the initiatives was critical. It helped to make the subculture approach more accessible, relevant and visible. Team leaders informed their peers they were responding to directions from the university. This narrative was an important protective strategy in that leaders modelled the expected behaviour and set the scene for reduced alcohol use by deferring to the university as the authority.

Further, the range of initiatives implemented at the games provided a mechanism for team leaders to reinforce expected behaviours in relation to alcohol use in multiple ways. Student views about the initiatives implemented provided valuable insights into the important features of a culture change approach within one university social world.

However, an interesting finding of this study is that in parallel with the focus on an alcohol culture change approach, it was important to provide an enhanced focus on sport and competitiveness. Our findings suggest that in support of the alcohol change approach and in

intervening at the individual, interpersonal and subculture community levels, a greater emphasis on sporting success through competing at their best was a major contributing factor in students reduced engagement with alcohol at the games. Unlike other studies that indicate sporting competitiveness is associated with greater alcohol consumption amongst men (Serrao *et al.*, 2008; Weaver *et al.*, 2013), this study found that it may serve as a protective factor for both men and women athletes alongside a strategy where messaging and activities are aimed at moderating alcohol use.

Further, Uni Nationals team leaders provided a sound mechanism for reinforcing the culture change approach and setting expectations. Alcohol use appeared to be incongruent with team leaders' aspirations to be successful at the Uni Nationals competition. Consistent with a study by Zhou *et al.* (2013), student leaders focussed on social cohesion, which is known to be an important factor for well-being in this sports-specific context. This finding is also consistent with the literature that indicates coaches and leaders can be influential in establishing and reinforcing the norms, climate and culture within a sporting team to optimise members' experiences (Pitts *et al.*, 2018; Wagstaff, 2016). Slater *et al.* (2014) point out that in a social–ecological approach to leadership, leaders influence members' behaviours by instilling values that align with the leader's vision. For instance, coaches' leadership style, beliefs and behaviours impact on athletes' motivation, athletic performance and antisocial behaviours (Pitts *et al.*, 2018). This highlights the importance of group-level influences and team dynamics on the personal alcohol consumption of athletes.

While some studies indicate that coaches lack self-efficacy and confidence to intervene when their athletes misuse alcohol (Nolt *et al.*, 2013), our study indicated that team leaders were empowered to manage the sporting environment. A study by Wagstaff (2016) also found coaches establish and reinforce the culture within a team through careful management. As with a study by Nolt *et al.* (2013), this current study found that knowledge and education about alcohol use can increase a team leaders' self-efficacy in managing the team environment, including understanding how team leaders themselves contribute to athlete alcohol use. Implementing the alcohol-related leadership training facilitated the opportunity for student team leaders to develop knowledge about alcohol use, improve alcohol management skills and rehearse strategies for dealing with alcohol-related situations. This enabled them to more competently respond in social situations at the Uni Nationals and hence be more successful in their team management responsibilities. This appears to have translated into managing alcohol use.

This finding is in line with evidence that indicates a role for peers in relation to addressing drinking behaviour through modelling and perceived social norms (Tuenissen *et al.*, 2012). Further, this is supported by a social–ecological approach that recognises peers and other close relationships are very influential in relation to health behaviour (Williams *et al.*, 2008), and students' beliefs about peers' attitudes and behaviours regarding alcohol use are dynamic and influential (Graupensperger *et al.*, 2020).

The perceived effectiveness of leadership training is also consistent with evidence about effective programs implemented on University campuses. Leadership training also appeared to effectively incorporate knowledge and skill-building activities that aimed to reduce the likelihood of risky drinking and improve skills at dealing with difficult social situations. Participants viewed the standard drink activity as the most useful part of the training in terms of its impact on their personal drinking. This aligns with a study by Goodstadt and Caleekal-John (2009) that found programs for university students are more likely to be effective if they include field (or laboratory) experience, as well as factual and experiential strategies, and if they occur over an extended period of time. Further, team leaders found it useful to discuss alcohol use and national policies about alcohol use with each other. This aligns with a study by Mastreolo *et al.* (2012) who found that an important approach in sport is for coaches to find ways they can discuss alcohol use and team policies about drinking.

In our study, Uni Nationals students recollected targeted messages and most thought they were relevant and engaging. This is supported by a study of young adults that found media health messages for drinking can be a powerful tool in changing people's risk perception associated with binge drinking (Ayers and Myers, 2012). Reynolds and Subasic (2015) and Chung and Rimal (2016) also found that communication messages to change collective social norms are probably best displayed when and where the relevant group-based identity is contextually relevant and likely to be salient. Further, changing collective social norms should preferably be based on campaigns that support the positive rather than negative steps that groups of consumers are taking in relation to their behaviour (Previte *et al.*, 2014). This was the case with the Uni Nationals targeted messages as they were developed with positive messages related to sport and were tested with Uni Nationals students. Co-designing targeted messages with students aimed to increase communication about alcohol and positively influence drinking culture to reduce the risk of harm. This is supported by Thabrew *et al.* (2018) who found targeted health messages can be effective, especially when students are meaningfully engaged in their co-design. However, not all Uni Nationals students were influenced by them suggesting further research is required to better understand optimal ways of framing these messages to support positive culture change.

While the literature indicates the potential of alcohol-free options to afford opportunities for socialising in lower-risk settings, thereby creating a safe and enjoyable environment in which to live and learn (Maney *et al.*, 2002), the outcomes of our qualitative study in relation to mocktail events were limited. The mocktail events were considered by students to be fun and engaging however had little or no impact on their alcohol consumption. It is worth considering that mocktails were provided free, which may have impacted on the readiness of students to consume them. Participants offered ideas for holding these events at times when they might have had a greater impact on alcohol use.

The CdM intervention was valued by most interview participants in terms of its capacity to motivate them to perform well in their sport. Individual studies consistently found that champions were important positive influences on implementation effectiveness (Miech *et al.*, 2018). However, these studies collectively indicated that champions alone were inadequate to bring about change yet in combination with other factors proved essential to implementation success (Miech *et al.*, 2018). This was also the finding from our study. From an alcohol culture change perspective, most students did not have a conversation with the CdM about alcohol. Few students were able to interact one-on-one with the CdM and overall, but this was not reported to be useful in terms of its impact on alcohol consumption. Some students felt having more than one person acting as a CdM in the future would provide greater opportunity to talk with participants about alcohol.

Not all students were positive about or complied with the change towards not accepting excessive alcohol use as the norm at the Uni Nationals. This is not surprising given sport-related positive reinforcement motives (e.g. drinking due to a win or good performance) and sport-related coping motives (e.g. drinking after a loss or bad performance), (Martens *et al.*, 2011). It is also not surprising given that this was the first attempt at implementing a culture change approach at Uni Nationals, and there is an opportunity to build on these strategies at future games.

Taken together, these findings provide insight into attempts to intervene in a university sporting event using a cultural change approach. Small changes to expectations and perceptions of Uni Nationals through conveying expectations and implementing culture change initiatives at the various levels of a social–ecological approach may positively impact on student interest and expectations of participation in such an event in future.

Implications for practice

In total, four culture change initiatives were implemented at Uni Nationals using an alcohol culture change approach. The development of initiatives likely to have success within the subgroup of university sport was guided by the levels of influence within a social–ecological framework. The findings of the current study have implications for those interested in reducing alcohol risk among college athletes. Intervention efforts indicate that a culture change approach could be useful across universities. Of greatest success was the leadership training, which relied on socio-ecological influences at the organisational and interpersonal levels. It supports the notion that university policies and practices have the potential to shape and influence risky alcohol use and associated harms, and that new ways to address alcohol use amongst university subcultures can be effective. Communication of university expectations is particularly important in a culture change approach, given the finding that student leaders leveraged this stronger direction to create a greater focus on sport within the university games. While a subcultural approach to reducing alcohol-related harms in a university sporting subculture warrants further investigation, our study highlights some successful features of the Deakin University approach that may inform practice in other university settings.

Limitations and future research

Our findings should be interpreted in light of the study limitations, including the small sample size. We acknowledge there will be benefit in continuing to investigate the impact of these and other initiatives at future Uni Nationals competitions and with other university subcultures.

Given the perceived impact of the student leader training at Uni Nationals, future research could explore the factors relating to the success of the training for a broader range of subcultures. Questions relating to the robustness of the student leader training, its modelling effect, whether the effects attenuate after the training and how to embed training more broadly across the university are worthy of greater consideration than have been accorded in the current study. It would also be valuable in future research to include the views and perceptions of Uni Nationals students who are non-leaders. Other structural changes made by the DUSA during the Uni Nationals that year such as locating student accommodation away from the main alcohol venues and conducting alcohol-free opening events may also have positively impacted in ways that are not explored in this study.

Conclusion

Our alcohol culture change approach focused on providing a repertoire of strategies in an effort to impact on the settings, skills and shared meanings and social worlds of target subgroups. This study extends previous research by providing important insights into how these specific university culture change initiatives shape students' practices around the use of alcohol at a sporting event. It draws attention to the opportunity to change normative behaviour at the subculture level through a range of interventions that work at the interpersonal, organisational and university community levels.

While culture change can take some time to translate into changed practice, participants reported some changes in relation to alcohol culture were already visible among Uni Nationals participants. Our interviews indicated that Uni Nationals student leaders noticed and appreciated the university-wide culture change approach. These Uni Nationals participants in particular experienced noticeable differences in alcohol culture from previous games. The leadership training that facilitated interactive and engaging activities

had the greatest impact on student leaders. Increasing knowledge about standard drinks and providing students with the opportunity to develop and rehearse strategies to manage risky drinking, provided leaders with skills and confidence to intervene in social situations. The impact of the targeted messages, mocktails and the CdM were considered to be less effective by student leaders. However, re-shaping the environment by establishing expectations and structuring the program in settings where drinking takes place in the context of a heightened focus on sport was reported by student leaders to have a positive effect on alcohol culture. These views may not be representative of the wider Uni Nationals student population for whom the strategies were designed. While this warrants further investigation, it may be that a multi-pronged approach to addressing culture change is a critical element of effectiveness.

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Adolescents' experiences of menarche and menstruation in disadvantaged schools in South Africa: a qualitative exploration

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Abstract

Purpose – This study explores how menstruation is perceived, experienced and navigated by school-going adolescent girls living in low-to-middle income settings in South Africa. Existing research from developing countries suggest that the onset of menstruation has implications for school attendance and academic performance. There is evidence that menstrual cycle–related symptoms (primarily physical) lead to difficulties in, or interference with, and disengagement from school, social relations, and physical activities (van Iersel *et al.*, 2016; Steiner *et al.*, 2011; Kiesner and Pastore, 2010; Taras, 2005). The onset of menstruation can be shame-inducing and has been associated with anxiety and confusion. Few studies have been conducted on menstruation in countries with a history of sectarian violence and characterised by substantial socio-economic disparities and high levels of gender-based violence. Understanding the experiences of girls in these contexts is important in generating contextually-grounded knowledge and appropriate interventions.

Design/methodology/approach – A qualitative, exploratory, descriptive and contextual research design was used to collect data from 48 adolescent girls aged 13–16 year-old. A total of six focus group discussions (FGDs) were conducted using a semi-structured questionnaire among a purposive sampling method. Data collected were transcribed verbatim and thematically analysed. Written parental consent was obtained for participants under 18 years old.

Findings – The findings illustrated complex psychological experiences in response to menarche and menstruation. Experiences of shame in relation to menstruation were aggravated by unsupportive responses from school teachers. Challenges such as scarcity of sanitary products were experienced as creating a barrier for girls' school attendance.

Research limitations/implications – Existing research from developing countries suggests that the onset of menstruation has implications for school attendance and academic performance. The research data includes the views of adolescent learners and their negative reactions and positive experiences towards menstruation within the school environment.

Practical implications – Given the comparative paucity of research emerging from developing countries in sub-Saharan Africa, this paper addresses an important gap in the literature by providing contextually-nuanced information about the menstrual experiences of adolescent girls. The study can further provide information for efforts made by the Department of Education and Department of Health regarding the impact of menstruation on adolescent girls' school attendance.

Social implications – This study provides important insights regarding the experiences of South African school girls in relation to menstruation. Although dominant feelings of shame, confusion and disgust may surround menstruation, the study also highlighted potential positive experiences associated with menstruation. Teachers and school administrators need to be oriented towards the needs of adolescent girls if issues regarding poor school attendance are to be addressed.

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Originality/value – To reduce absenteeism in schools and ensure learners are provided with improved allocation of sanitary products in schools, there is a need for the advocacy regarding sexuality education and resources to promote the psychological health of adolescent girls.

Keywords Adolescent school girls, Menstruation, Menarche, Psychological experiences, Focus group interviews

Paper type Research paper

Introduction

Menstruation is a landmark event in the life of an adolescent girl. It is experienced and navigated differently according to culture and the socio-economic context but is almost universally associated with shame and secrecy (Teitelman, 2004; Orringer and Gahagan, 2010; Lee *et al.*, 2011; Sawyer *et al.*, 2012; Chandra-Mouli and Patel, 2017). There has been a significant body of research on the menstrual experiences of adolescent girls in developing countries in Asia (e.g. India: Chandra-Mouli and Patel, 2017; Pakistan: Rizvi and Ali, 2016; Nepal: Crawford *et al.*, 2014) and Africa (see Hennegan *et al.*, 2019 for a systematic review). Although this study is contextually based in South Africa there is a shortage of literature in sub-Saharan Africa. Shannon *et al.* (2020) and Sawyer *et al.* (2012) state that although there is an increasing recognition of the difficulties and challenges that women and adolescent girls experience during menstruation there remains limited understanding of the menstrual experiences of individuals. The purpose of the current study is to add to the existing knowledge base by exploring how menstruation is perceived, experienced and navigated by South African school-going adolescent girls living in low-to-middle income settings. South African society is characterised by patriarchal ideologies and attitudes, ongoing gender-based socio-economic disparities and high rates of violence against women and girls (Mudau and Obadire, 2017). These socio-cultural features may have implications for how menstruation is experienced and managed by adolescent girls in the country.

Most South African research studies on menstruation have focused on issues related to HIV/AIDS, reproductive health and menstrual knowledge and practices (e.g. O'Sullivan *et al.*, 2007). The findings of these studies correspond to those of the international literature and note that the onset of menstruation is typically associated with confusion, fear and shame for adolescent girls (Scorgie *et al.*, 2016; Ramathuba, 2015; Miiro *et al.*, 2018). These experiences tend to be amplified by resource constraints (e.g. lack of access to running water or sanitary towels) which have impact on menstrual management. A few studies conducted in low-income settings in South Africa have found that menstruation is experienced by adolescent girls as stigmatising (Mkhwanazi, 2010; Johnston-Robledo and Chrisler, 2011) and as a period during which they are more likely to infect men with sexually transmitted diseases (O'Sullivan *et al.*, 2007). Some studies (e.g. Padmanabhanunni *et al.*, 2018) have identified distinct cultural practices that are associated with menstruation including the practice of virginity testing or *Umhlanga* which occurs at menarche and is aimed at regulating the sexual behaviour of girls.

Given the comparative paucity of research emerging from developing countries in sub-Saharan Africa, this paper addresses an important gap in the literature by providing contextually nuanced information about the experiences of adolescent girls.

Methods

Study design and participants

The study was qualitative, exploratory and idiographic in nature. The study was conducted in the Western Cape Province of South Africa during the period January–June 2019.

Participants included adolescent girls ($N = 48$) enrolled at three separate high schools and were recruited through purposive sampling. Participants ranged in age from 13 to 16 years with a mean age of 15 years. The majority of the participants were black African (68%) and reported subscribing to the Christian faith (88%). Their ethnicities were "so-called" Black African and Coloured [1], in terms of the South African ethnicity categorisation context. Their home languages included isiXhosa, English and Afrikaans [2].

Ethics approval

Ethics clearance was sought and granted from the Senate Research Ethics Committee (number 15/3/29) of the University of the Western Cape. Permission was also obtained from Western Cape Education Department to recruit adolescent girls from school settings. One week before the commencement of the study, all the learners interested in participating were requested to take a consent form to their parents/guardians for their signature and had to submit the signed document to their teacher. Participants also provided assent for taking part in the study.

Data collection

Six focus-group discussions (FGDs) with eight participants per group were used for data collection purposes. The FGDs were guided by the first author and a research assistant and took place in a classroom after school hours. As described in (Polit and Beck, 2012), in a focus group interview, a group of five or more people is assembled for a discussion. The interviewer (or moderator) guides the FGD discussion according to a written set of questions or topics to be covered, as in a semi-structured interview, and the people selected are a fairly homogenous group to promote a comfortable group dynamic. Each FGD was audio-recorded and transcribed verbatim. Participant demographic characteristics are shown in Table 1.

Semi-structured interviews were conducted with a purposive sample. According to (Howitt, 2010, Merriam and Tisdell, 2015 and Etikan *et al.*, 2016), semi-structured interviews tend to be the preferred data for qualitative analyses. In these interviews, people are encouraged to freely recall their experiences. The questioning style is designed to encourage richly detailed descriptions of experiences of phenomena, and the recording of the interview is usually transcribed using a literal, verbatim approach. Purposive sampling is aimed at optimising data quality and relevance. Six of the participants, two from each school, used an adapted interview guide derived from the Adolescent Menstrual Attitude Questionnaire (AMAQ) (Morse *et al.*, 1993). The *AMAQ* is a valid and age-appropriate questionnaire created to measure the responses of adolescents to menarche (Morse *et al.*, 1993). It consists of a five-point Likert scale with versions for both pre- and post-menarcheal girls. It is also a reliable and multidimensional instrument that can be used to measure both pre-menarcheal and post-menarcheal attitudes of adolescent girls (Beausang and Razor, 2000). The interview schedule had four focus areas: knowledge about menstruation; 2) the influence of cultural influences on

Table 1. Demographic characteristic of participants of the FGDs per school

School	Focus group number	Gender and ethnicity	No of participants
A	Focus group 1	Females and mixed ethnicity	8
A	Focus group 2	Females and mixed ethnicity	8
B	Focus group 3	Females and mixed ethnicity	8
B	Focus group 4	Females and mixed ethnicity	8
C	Focus group 5	Females and mixed ethnicity	8
C	Focus group 6	Females and mixed ethnicity	8
	Total		48

attitudes regarding menstruation; 3) personal experiences and support during menstruation and 4) the impact of available resources and the lack thereof on experiences of menstruation. Participants were also asked to complete a short questionnaire that contained items pertaining to age, grade, race and age at menarche and who their primary source of information regarding menstruation was (i.e. mother, father, grandmother, aunts or peers).

Data analysis

Thematic analysis (Braun and Clarke, 2006; Clarke and Braun, 2013) was used to analyse the data, and this entailed data familiarisation, initial coding generation, searching for themes based on initial coding, review of themes, theme definition and report writing (Braun and Clark, 2006; Denscombe, 2010; Lathlean, 2010; Clarke and Braun, 2013). Once the initial codes were generated the researchers searched for themes by categorising codes into meaningful groups (Willig, 2008; Martella *et al.*, 2013). These tentative themes were then examined and refined. After the themes were established, they were labelled in a conceptually distinguishable manner. The emerging themes were grouped into thematic categories and are presented in the findings below.

Results

This study explored how menstruation is perceived, experienced and navigated by school-going adolescent girls living in low-to-middle income settings in South Africa. The dominant themes emerging from the data are discussed below and divided into three broad areas namely, negative emotional reactions associated with menstruation, experiences within the school environment and positive feelings towards menstruation.

Negative emotional reactions associated with menstruation

The results suggested that negative effects could influence the adolescent girls during their menarche and menstruation at schools in the Western Cape. These include fear and shock at menarche, feelings of disappointment, feeling numb and sore (pain), and feelings of disgust and shame.

Fear and shock at menarche: "I was not prepared". Several of the participants reported not having been prepared for menarche and experiencing feelings of confusion, fear and shock at menarche. This is captured in the account below:

> The first time I got mine I did not understand what was wrong with me. . .. I was first scared "[because]" I thought I bumped my vagina somewhere, but I did not feel any pressure and it was not sore. (P2, School B)

> Like the first time I got it, I was worried about going to parties cause every time I hear the boys. . . If someone rapes you, then you get pregnant. Yes, then you get pregnant. You have to be careful. (P3, School A)

Feeling disappointed. The onset of menarche was associated with a sense of disappointment for many girls due to their appraisals that their ability to participate in activities would be significantly limited as a consequence of menstruation:

> I was unhappy cause I was thinking "why must it happen now? It's too early." Because it was too early for me. I was thinking why must it happen to me now? I still wanted to like when it's summer then I wanna swim all the time and not worrying about periods. (P4, School B)

Feeling numb and sore. Menstruation was associated with severe physical discomfort including debilitating physical pain. This was appraised as impacting girls' ability to attend school:

> Like if you're in pain then you cannot concentrate on your work properly cause you're more concentrated on the pain. (P3, School B)

> For the first few days I'm like numb basically so I cannot. . . so I feel like I should not come to school cause then I cannot work, I cannot concentrate. (P7, School A)

Feelings of disgust and shame. Furthermore, some participants declared their disgust and shame during the menstruation at schools and added that they feel the intense need to bathe and essentially "get rid" of the disgust. It could be inferred that the fact that they feel disgusted or ashamed could be a reflection of or the effect of cultural perceptions and myths within the less rich environment that says that menstruation is a disgusting and dirty thing.

> Disgusting [giggles]. Me too. I also feel ashamed because when I wash pads in the bath, I do this [demonstrates and giggles] (P1, School C)

> It is stinking. [Participants giggle]. (P4, School C)

Experiences within the school environment

The participants acknowledged that school was an important environment in their life, where they spend most of their time. It was further a place where they receive an education and knowledge related to how to manage their menstruation and hygiene. They declared that their teachers have a significant influence on their menstruation knowledge and management hygiene skills. Teachers are also an important source of information for adolescent girls who may be experiencing their first period. Responses from the learners varied as some spoke about teachers not understanding what they go through.

Perceived lack of understanding from schoolteachers: "they do not understand". Three participants reflected on experiencing limited support and understanding from female schoolteachers and this impacted their ability to manage menstruation as reflected in the accounts below:

> It's so hard, especially when you have the worst teacher that do not let you go to the toilet to change. (P1, School B)

> You still have to do PT [physical training] and when you have your period and they do not understand that you cannot do most of the stuff that they ask you do to, like running, otherwise it will flow more. (P8, School A)

> So, I feel like I should not come to school cause then I cannot work. It's so sore. You're like dying inside but you do not wanna say anything because no one understands. (P6, School A)

Ridicule from boys: "They're going to laugh; it will be the worst day of my life" (P7, School A). All participants reported a sense of dread at the possibility of their menstrual status being revealed at school and the ridicule they would then face from boys.

> The boys they will laugh at you and they will go on and you'll be dead. . . They will tease you, and boys never forget. (P8, School A)

Several participants reported that boys were not sufficiently educated about menstruation and that this possibly contributed to their behaviour.

> The boys do not know what you're going through they're just like "oh there's blood on your pants". The boys will embarrass you miss and call you names. (P5, School A)

Bragging about their period. Despite fears of ridicule from boys, several participants reported that their peers used menstruation as a means of garnering status in their relationship with boys and receiving sympathy from boys:

> Most of the girls, if they have their periods then they brag about having it or they brag about having stomach cramps and then they will like go to the boys and be like "do not touch me I have my period, I'm in pain" and then they would like make a big fuss about having it. (P7, School A)

Feeling happy and proud: "I changed from childhood to adulthood". Alongside negative experiences of menstruation, three participants reported experiencing a sense of pride at menarche because they "were now women". They also reported an increased sense of happiness related to appraisals that they were now similar to their peers.

> I was happy actually because my other friends had it and now I finally got it. (P1, School A)

> Now that I realised. . . now I'm happy because I'm old. And it's been long time since I want to be old. And then I think as time goes on, I'm starting to get old and grow up so that I can do things on my way. (P8, School C)

Discussion

The aim of this qualitative study was to focus on the experiences of menstruation among schoolgirls in low-to-middle income settings in South Africa. There were several distinct findings. First, the study confirmed that negative emotional reactions were common among adolescent girls. This included feelings of confusion and shock at menarche, which were related to a lack of preparation as well as feelings of shame disgust and disappointment. Al Omari *et al.* (2016) stated that menarche or the first menstruation occurs at a critical time of development where an adolescent girl deals and struggles with self-image, identity and peer pressure, and as a result may feel overwhelmed, scared and anxious. This fear and anxiety can also be seen as an indicator of lack of information and knowledge that some of the girls experienced. Many young girls have either little or no knowledge of menstruation prior to them experiencing menarche (Deo and Ghattargi, 2005; Chothe *et al.*, 2014). This often causes anxiety and negative emotions associated with menstruation. This is troubling because their knowledge and information influence the practices they follow in terms of their overall menstrual experience. Existing studies (Teitelman, 2004; Khanna *et al.*, 2005; Mahon and Fernandes, 2010; Liu *et al.*, 2012; Shanbhag *et al.*, 2012) suggest that, while girls are prepared for and taught about the physiological aspects of this menstruation and its hygienic practices, emotional factors and the support needed are often neglected and ignored. This may be linked to feelings of shame, disgust, stress and anxiety. These findings can also be linked to the results of a study conducted in Nigeria which found that the majority of their respondents viewed menstruation as "cleaning-up" of the uterus and the release of bad blood (Adinma and Adinma, 2008). Another study conducted in rural Uganda found that 69% of the girls in the study reported experiencing feelings of shame and insecurity during menstruation (Hennegan *et al.*, 2016).

The study also confirmed that menstrual cycle-related symptoms (e.g. physical pain) and fears of exposure lead to increased disengagement from school and school-related physical activities (van Iersel *et al.*, 2016; Steiner *et al.*, 2011; Kiesner and Pastore, 2010; Taras, 2005). A similar study conducted in Malawi found that one-third of female participants reported that they missed at least one day of school during their menstrual period due to the physical pains and symptoms associated with menstruation (Grant *et al.*, 2013). This disengagement was experienced as hindering their full participation in school. Feelings of disgust and shame were also experienced by participants. Participants have alluded that there is a need for health education for boys, for schools to provide free sanitary products as well as medication and support in the form of school nurses and counselling for girls who experience menstruation for the first time. Chinyama *et al.* (2019) found in their study conducted in Zambia that there is an overall need to improve the menstrual hygiene management of girls at

schools. This underscores the need for parents, caregivers and teachers to be actively involved in educating young adolescent girls concerning menstruation as this partnership can lead to successful development and improved menstruation experiences. As adolescents are often unable to communicate their experiences and concerns with their parents, teachers have a central role to play in providing information about menstrual health management. UNESCO (2014) estimated one out of ten girls in sub-Saharan Africa miss school during their menstrual cycle corresponding to as much as 20% of a given school year. Some girls experienced inadequate hygienic management resources and lack of teachers' support at schools (Fingerson, 2006). Studies have supported the assertion that difficulties in the management of menstruation negatively affect school participation (McMahon *et al.*, 2011).

Third, the study confirmed the finding (e.g. Jewitt and Ryley, 2014) that, despite the potential role of teachers in providing adequate information about menstruation and normalising the experience for adolescent girls, teachers were experienced as unsupportive. This had the potential to enhance feelings of shame and secrecy around menstruation. One of the critical challenges that girls face in the school environment is ridicule from boys (Mahon *et al.*, 2015), which impacts their self-esteem. Most of the girls feared being ridiculed by boys and wanted to be secretive around boys at this time. In addition, they feared that when "leakage" would occur in the presence of boys, it would devastate or ruin their image with the boys in future. The need for this secrecy can perhaps also be linked to cultural perceptions and influences. Mohamed and Larsen-Reindorf (2020) reports that in a study conducted in Ghana it was found that men and boys play an influential role in supporting girls in their menstrual hygiene management and menstruation experience. It is deemed important that an understanding of menstruation and the challenges associated with it is made known to adolescent boys. However, even though menstruation may no longer be regarded as a taboo topic in society and within certain cultures, it is still a sensitive topic that some people and especially males are uncomfortable with. This could be as a result of the way in which men were socialised in avoiding the "female thing." The study underscores the need for including educational programmes that involve boys in open dialogue on issues of reproductive health, menstruation and the impact of teasing and bullying on self-esteem (McMahon *et al.*, 2011; Mears, 2012; Crichton *et al.*, 2013; Mason *et al.*, 2013; Jewitt and Ryley, 2014; Gupta *et al.*, 2018; Rheinländer *et al.*, 2018; UNPFA, 2018). Surprisingly, some adolescent girls expressed that other girls may "use" menstruation as a strategy to gather attention as a result of their "status" in terms of gaining sympathy from boys. This may be reflective of girls' attempts to feel empowered during menstruation in a context where their needs are not fully recognised (Mahon *et al.*, 2015).

Finally, the study found that menstruation was experienced positively by some adolescent girls. This status would then also indicate the "new-found" freedom as being "old" and grown up, which was perceived as allowing them to make their own decisions (McMahon *et al.*, 2011; Garg and Anand, 2015). Positive experiences associated with menstruation have been documented in the South African literature (Padmanabhanunni and Fennie, 2017) and highlight the potential for menstruation to be reconstructed as a positive and potentially empowering experience.

In conclusion, the study confirmed that (Mattebo *et al.*, 2015) there is a need for sexual and reproductive health education for both girls and boys and that schoolteachers may need to be sensitised to the challenges associated with menstruation for adolescent girls particularly those from low-income settings.

Strengths and limitations

This qualitative study presents the potential to promote retention of female learners in high school settings by providing information on the needs of adolescent girls in relation to

menstruation. The study can also provide information for efforts made by the Department of Education and Department of Health regarding the impact of menstruation on adolescent girls' school attendance. The study reports findings from primary data. As such, the research data include the views of adolescent learners and their negative reactions and positive experiences towards menstruation within the school environment. The study was limited by the sole use of qualitative research methods. Triangulating the study with quantitative instruments focussing on perceptions and attitudes towards menstruation may yield more rigorous findings. In addition, for several participants, English was their second language, and, despite the use of an interpreter, it is possible that this impacted their ability to express themselves.

Conclusion

This study provides important insights regarding the experiences of South African schoolgirls in relation to menstruation. In addition to dominant feelings of shame, confusion and disgust, the study also highlighted potential positive experiences associated with menstruation. School teachers and management need to be oriented towards the needs of adolescent girls if issues regarding poor school attendance are to be addressed.

Government policy currently does not make provision for women's sanitary needs and this is a significant area of concern. These types of policies could significantly improve the reproductive health and well-being of women and girls. Additionally, issues of disposal and sustainability also need to be considered both within South Africa and within sub-Saharan contexts. In terms of disposal, it is important to build in awareness of the need for safe methods of disposal. By bringing awareness to the adoption of safe waste management techniques, individuals will be able to play their role towards achieving the sustainable development goals. Learners would also be able to sustain self-care techniques and implement these safe management methods. Finally, the study suggests that awareness raising among schoolboys has the potential to create a friendlier school environment for girls during menstruation and increase their participation.

Notes

1. The racial groups, that is, "coloured," or "mixed", "black African," and "Indian," were employed as racial categories within the Apartheid era to reinforce a segregated society and refer to those who were not afforded the same benefits as "whites" in this era. These terms are used here solely for descriptive purposes, and their use does not imply acknowledgement of these terms by the authors.
2. Afrikaans, is a language which is majorly spoken by the "[1]Coloured" and "White" population in both urban and rural communities.

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Examining the intention to stay home due to COVID-19: a pandemic's second wave outlook

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Abstract

Purpose – At present, almost the whole globe is facing a severe threat of coronavirus disease 2019 (COVID-19). The present study examines the intention to stay home due to COVID-19 during a second wave of the pandemic.
Design/methodology/approach – The study employed a deductive approach based on cross-sectional data. An online survey is conducted from citizens of Pakistan. A convenience sampling is applied to target the respondents. In total, 238 useable responses proceed for final analysis. The structural equation model (SEM) is used to infer the results.
Findings – The findings of the study highlight a positive and significant effect of fear of COVID-19, attitudes to stay at home behaviour (AtSHB), knowledge about COVID-19 (Ka19) and health consciousness (HC) on the intention to stay at home (ItSAH).
Practical implications – The study would provide the guidelines to policymakers and planners to develop the policies which may establish the individual's ItSAH. This strategy would restrict the spread of COVID-19. The government should also formulate the plannings to reduce the fear about COVID-19 and health concerns to combat the pandemic. The government should launch awareness programs regarding the spread and cure of COVID-19.
Originality/value – This study is the first study which highlights the factors such as fear, HC, attitudes and knowledge towards ItSAH. The study may be unique in the COVID-19 perspective, particularly in the Pakistani context.

Keywords Intention to stay at home, Fear of COVID-19, Attitudes to stay at home behaviour, Knowledge about COVID-19, Second COVID-19 wave

Paper type Research paper

Introduction

In the present era, the whole globe faces severe issues regarding the coronavirus disease 2019 (COVID-19), which is declared as a global pandemic since the completion of 2019. Worldmeters (2020) claims the spread of such pandemic up to 213 countries of the globe. The significant number of victim nations to increase because it (COVID-19) is an extremely transmissible infection (Worldmeters, 2020). The situation goes worst due to asymptomatic carriers (WHO, 2020a), unavailability of vaccines as well as curable medicine for fighting against the pandemic. In this way, the spread of COVID-19 can be limited through positive and specific behaviour, i.e. washing of hands and physical or social distancing. Various economies have taken these steps by adopting "stay at home policies" (Wibowo, 2020a, c). Besides, fear of COVID-19, attitudes to stay at home behaviour (AtSHB), knowledge about the complications of COVID-19 and health consciousness (HC) in COVID-19 period may divert individuals' intentions towards a stay at home. In this regard, the related literature offers the understanding of health-oriented behaviour curtailed from the intention to involve in such a specific behaviour. Various scholars underlined a significant association between intention

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and health-related behaviour (McEachan *et al.*, 2011). Thus, an investigation on an intention to involve in behaviour, which can be preventable the blowout of COVID-19, is a dire need of the day. Like other economies, Pakistan is facing severe problems of the speedy spread of COVID-19 (Shah *et al.*, 2020). The government of Pakistan is taking the effective initiative to combat the COVID-19 with various modes including social distancing, usage of sanitizers and strict implementation of the standard operating procedure (SOP) (National Action Plan, 2019).

To keep in consideration, the present study attempts to investigate the role of the factors such as fear of COVID-19, AtSHB, knowledge about COVID-19 (Ka19) and HC towards individuals ItSAH during the second wave of the pandemic. The outcomes of a research would be helpful for policymakers and planners to understand the effects of fear, knowledge and HC of the individuals on the ItSAH. The government would formate the other related policies regarding the elimination of fear and awareness programs which may further bound the individuals to stay at home. This strategy or steps would further eliminate the spread of COVID-19.

Literature review and conceptual framework

In the present situation of COVID-19, the intention has become essential in reflecting the behaviour (Shah *et al.*, 2020). The measures such as positive attitudes, good knowledge and individuals' good practice towards COVID-19 are the effective weapons against the battle of pandemic (Maheshwari *et al.*, 2020). An intention is associated with behavioural, which shows a possibility to take part in a particular behaviour (Fishbein and Ajzen, 1975). It also underlines the individuals' willingness and extent of efforts which he/she made to accomplish behaviour (Ajzen, 1991; Zeithaml *et al.*, 1996; Liu *et al.*, 2018). In this way, an intention of individuals stay at home during the COVID-19 pandemic reflects the citizens' sturdy willing to act upon such the behaviour (Sumaedi *et al.*, 2020a, b) which can be classified as a health-related behaviour.

Someone's overall assessment of the behaviour towards a particular objective is regarded as an attitude as one's comprehensive assessment of behaviour. This extent may be of both the directions positive and negative (Peters and Templin, 2010). An attitude is an amalgamation of individual's values as well as belief assumed to the consequence of engaging in a specific behaviour (Peters and Templin, 2010). In the theory of planned behaviour (TPB) an individual's attitudes could be determined by his/her intention to accomplish such a behaviour (Ajzen, 1991). Reflecting on individuals inclined to execute health-related behaviours if they recognized the action as the generator of fruitful effects (Bamberg *et al.*, 2003). Sumaedi *et al.* (2020a, b) demonstrate the intention to use official COVID-19 websites as the significant analyst of attitudes, quality of the website and subjective norms. In the recommendations of Grønhøj *et al.* (2013), attitudes and perceived behavioural control are found to be the significant antecedents of behavioural intention among females. Labrague and Santos (2021) statistically found that amplified level of fear of COVID-19 is significantly related to increased organizational distress, decreased job satisfaction and both professional and organizational turnover intentions. In China, Huang *et al.* (2020) completed a province-level investigation. The outcomes of the study revealed a positive effect of both fear and collectivism on people's preventive intention. Such factors could substantially work as the appliances for the reduction of each other's constructive impact on individual's precautionary intention. In the medical arena, frontline nurses seriously affected by COVID-19 pandemic in emotional, mental and psychological health problems. Besides, the fear of COVID-19 enhanced the ratio of turnover intention among the nurses. The leadership support compensates a positive mediation for the negative effect of fear of COVID-19 on turnover intention among nurses (Khattak *et al.*, 2020).

Among the adults of Jordan, a cross-sectional online survey conducted by Zaid *et al.* (2020). The consequences of the investigation revealed that adequate knowledge is a robust way of

common symptoms of COVID-19 and disease transmission. Further, it was highlighted by the respondents that they are at high risk due to complications of COVID-19 such as chances of heart problems, weak immune system and diabetes. The respondents also showed the great apprehensions and concerns that droplets from coughing, sneezing or coughing and contaminated surfaces may transmit the COVID-19 virus from COVID-19 careers to healthy people. According to an investigation of Olaimat *et al.* (2020), the students who majored with medical science education are highly acknowledged about the COVID-19 than other disciplined or college students. Postgraduate students are found to be significantly higher knowledge as compared to the undergraduate student. In a simple sense, the COVID-19 pandemic is a key and global challenge associated with health. The students' knowledge about health provides a significant signal to develop planning, tracing and self-quarantine. In the perception of Rahman and Sathi (2020), sufficient Ka19 provides the guidelines about safety and wearing masks. The updated experience also provides a road map for healthcare authorities in enhancing suitable preventive practices throughout the COVID-19 outbreak.

Among the students of Salahaddin University Iraq, the consumer's awareness is positively and significantly related to HC and environmental concerns (Abdulsahib *et al.*, 2019a, b). Similarly, during the COVID-19 pandemic, Pu *et al.* (2020) made an effort to investigate the impact of HC mechanism on home-based exercise. The outcomes of the study demonstrate significant differences in home-based practice in terms of age, marital status and gender. HC has a positive and substantial effect on home-based exercise. Perceived behavioural control is a significant factor, which mediates the relationship between home-based exercise and HC. In South-West Saudi Arabia, COVID-19 is also regarded as a noxious, transmissible and life-threatening infection that can be transmitted through human-to-human contact. Social distancing and hand hygiene are the most common preventive measures taken by participants who were taken care of by avoiding travelling to an infected area and wearing face masks. A considerable number of educated participants underlined substantial knowledge of the disease, and all participants showed excellent readiness for the deterrence and control of COVID-19. On the other hand, area, gender and age were not found to be non-significant analysts of COVID-19 awareness (Tripathi *et al.*, 2020). In Spain and France, the higher social consciousness decreases the ratio of infected population intensely. An outbreak may be in control of health care structure, which yields to reduce the death rate and confirm socio-economic stability (Mahmud *et al.*, 2020). According to the investigation of Royne *et al.* (2014), attitude is the meaning factors that predict the HC and perceived benefits about any particular product of the situation. In industrial construction point of view, the emergence of any disease, i.e. HIV/AIDS, infection bring fear, prejudice and lifestyle risk. However, prejudice of HIV/AIDS transmission could be determined through education and existed knowledge (Bowen *et al.*, 2016). In the similar aspect, Shah *et al.* (2020) proposed that the factors such as fear and Ka19 and HC are significantly diverted the attitudes of individuals towards the purchasing of the mask to be safe and sound.

As a result, the literature demonstrates the different predictors such as the TPB factors, perceived severity and susceptibility to predict the "stay at home" policy during the COVID-19 epidemic (Sumaedi *et al.*, 2020a, b). Besides, HC, Ka19 and fear of COVID-19 are found to be the good analysts of mask purchase attitudes (Shah *et al.*, 2020) during the COVID-19 pandemic. However, the literature still lacks the investigation of fear of COVID-19, HC and Ka19 towards the ItSAH (Shah *et al.*, 2020; Sumaedi *et al.*, 2020a, b; Ahorsu *et al.*, 2020; Dong *et al.*, 2020; Wang *et al.*, 2020). Based on such the dire need, we proposed the following model (Figure 1) for testing among the citizens of Pakistan.

At present, the appearance of the COVID-19 and its frightful consequences has brought various suspensions in terms of anxiety, worries among the individuals globally (Ahorsu *et al.*, 2020). Undeniably, fear of contacting individuals is mainly developed from a probable infested by COVID-19 (Li *et al.*, 2020). Inopportunely, fear may intensify the impairment of the disease itself. An occurrence of pandemic-natured COVID-19 has made worse fears globally

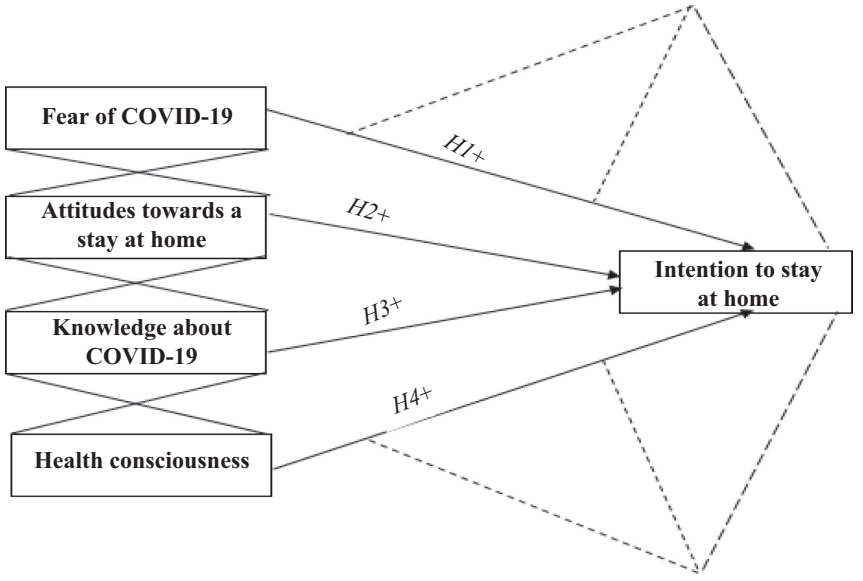

Figure 1.
Conceptual model of the study

(Huang *et al.*, 2020; Guan *et al.*, 2020), which ultimately leading to disgrace in some cases (Li *et al.*, 2020; Centers for Disease Control and Prevention, 2020a, b). According to Pappas *et al.* (2009), fear has a direct connection with its transmission rate, morbidity and mortality. This further creates psychological problems, i.e. discrimination and stigmatization (Pappas *et al.*, 2009). In a condition of severe fear, people may not reflect visibly and realistically when responding to a pandemic. In the marketing purpose, Burns *et al.* (2010) claim a significant positive association of fear of crime with shopping intentions. In the North American and the United Kingdom contexts, fear does not affect uncertain future and entrepreneurship intentions (Gurbuz *et al.*, 2017). In the disease of pandemic side, fear is positively and significantly associated with HIV/AIDS or infections, etc. (Bowen *et al.*, 2016). However, particularly in the COVID-19 outbreak, fear of COVID-19 is the strong predictor of the mask purchase attitudes and intentions (Shah *et al.*, 2020).

In this way, the present literature focuses on the treatment of COVID-19 with an effective vaccine, wearing of masks, etc. (Dong *et al.*, 2020; Wang *et al.*, 2020; Shah *et al.*, 2020). However, there is still a need to reduce the psychological pressure of COVID-19 by making COVID-19 free society (Shah *et al.*, 2020). To keep in view the present second wave scenario of COVID-19, we try to investigate the role of fear of COVID-19 on the ItSAH that not been remained under the consideration of the scholars (Ahorsu *et al.*, 2020; Dong *et al.*, 2020; Shah *et al.*, 2020; Wang *et al.*, 2020). Therefore, we proposed the following hypothesis:

H1. Fear of COVID-19 has a positive and significant effect on the ItSAH.

The TBP theory highlights an individual's attitudes towards behaviour govern (his/her) intention to do such action (Ajzen, 1991). With regard to health-related behaviour, individuals inclined to execute health-related behaviours if they supposed such behaviour would provide them with practical consequences (Bamberg *et al.*, 2003). In a simple sense, if someone estimated a positive behaviour, then he/she would intend to perform it. The related literature empirically confirms such the positive effects (effect of attitude towards behaviour on the intention) in the health-related behaviour (Chan and Tsang, 2009; Dumitrescu *et al.*, 2011; Grønhøj *et al.*, 2012; Al-Swidi *et al.*, 2014; Close *et al.*, 2018; Fung *et al.*, 2018; Kim *et al.*, 2018;

Ates, 2019; Zhang *et al.*, 2019). Recently, in the COVID-19 perspective, Shah *et al.* (2020) found a significant association between mask attitudes and purchase intentions in Pakistan.

Consequently, the attitude is associated with the individual's overall assessment of the behaviour. This attitude has both aspects positive and negative, which is performed by any individual (Peters and Templin, 2010). It is regarded as an amalgamation of somebody's values and belief regarding reach the consequence of participating in a particular behaviour (Peters and Templin, 2010). In this way, in the present challenging situation of COVID-19, we made an effort to evaluate overall attitudes (positive and negative) towards the behaviour, i.e. "stay at home" for the duration of the pandemic. Henceforth, we expect:

H2. AtSHB have a positive and significant effect on the ItSAH.

In the marketing perspective, consumer knowledge is a multidimensional perception where the miscellaneous categories of product-oriented experience lead to the different facets of knowledge (Alba and Hutchinson, 1987). Nevertheless, the aspect of the knowledge has various impacts on both product evaluation and choice behaviour, depending on the prevailing circumstances and tasks. In the literature, a considerable effect of consumer's knowledge on his/her attitude towards organic food was claimed by the numerous scholars (Chryssochoidis, 2000; Padel and Foster, 2005). It is observed that individuals who have adequate knowledge about organic food tend to be a positive and more significant attitude (Stobbelaar *et al.*, 2007). The customers who have consumed organic food earlier is more inclined to have an optimistic attitude of purchase than un-experienced or first time purchasing consumers (Roddy *et al.*, 1996). On the contrary, the individuals have negative attitudes towards food if they have previous knowledge about unsafe food control process (Redmond and Griffith, 2005). Knowledge is to be positively associated with expertise or consumption (Pieniak *et al.*, 2008). The core constructs such as vision, knowledge, insight, experience, commitment; social skills and experience enhance the educational competencies (Jensen, 2000). Children's knowledge and attitudes towards cancer and health-related behaviour significantly predict health life (Bendelow *et al.*, 1996). In the COVID-19 early outbreak, Shah *et al.* (2020) found a significant and positive effect of knowledge about the consequences or outcomes of the COVID-19 on mask attitudes and purchase intentions.

As a result, the various scholars investigated the consumers' knowledge about food (safe, unsafe and organic), product, etc. (Chryssochoidis, 2000; Padel and Foster, 2005; Pieniak *et al.*, 2008). However, in the COVID-19 perspective, the researchers focused on Ka19 towards mask attitudes and intentions and age (Maheshwari *et al.*, 2020; Shah *et al.*, 2020). Based on the non-existence of relationships, we proposed the following hypothesis:

H3. Ka19 has a positive and significant effect on the ItSAH.

Human health is a basic need for every human being with their right to engage and make a choice for their safe, healthy and happy life (Shah *et al.*, 2020). The consciousness of health is the extent to which an individual to get on health activities (Becker *et al.*, 1977). The individuals may change their behaviours due to their healthy lifestyle and health-conscious inclinations (Huang, 2014). HC positively affects attitude, and then the formation of the purchasing judgements is conceivable (Zanoli and Naspetti, 2002). Conversely, some researchers like Grossman and Shapiro (1988) and Bhatia (2018) not supported the positive association of consumers' brand consciousness with the attitude towards counterfeit products. According to Abdulsahib *et al.* (2019a, b), consumer awareness about the products is forecasted HC and environmental concerns. In the COVID-19 early outbreak, Shah *et al.* (2020) found the positive association of HC with mask attitudes.

In consequence, we prosed to investigate the effect of HC about COVID-9 on the ItSAH, which is not explored yet (Abdulsahib *et al.*, 2019a, b; Shah *et al.*, 2020; Maheshwari *et al.*, 2020). Thus, we proposed the following:

H4. HC has a significant and positive effect on the ItSAH.

Methods

Data collection and sample size

This study employed a quantitative approach. We conducted an online survey in view of the social distancing policy of the government of Pakistan. The survey is suitable because the prior studies on human behaviour applied the same technique in the course of a pandemic (Brooks-Pollock *et al.*, 2011; Sumaedi *et al.*, 2020a, b). The survey was conducted after the official announcement when Pakistan braced for the second wave of coronavirus after October 29, 2020 (UCA News, 2020). Pakistan has reported more than 3,000 coronavirus cases and 59 deaths during the last 24 h. A recent study by the National Command Operation Centre (NCOC) of Pakistan claims 98 health professionals have died (UCA News, 2020). On October 29, Pakistan informed over 1,000 COVID-19 cases – the first time since July, when it grew the pandemic appealing much under control. Pakistani health specialists warned the country as in the grip of a second COVID-19 wave that could substantiate to be more lethal than the first wave. We developed online SurveyMonkey software by uploading the items along with the responses. SurveyMonkey is regarded as one of the top survey online tools, very helpful and user friendly tool for an online survey (Nagalakhmi and Trivedi, 2015). We tried to select Pakistan's ordinary citizens as due to more uncertain, bored, anxious and isolated. Besides, they may feel grief and fear over the virus's effect on their families (WHO, 2020b). We tried to share the link among the respondents throughout all the provinces, i.e. Sindh, Punjab, Khyber Pakhtunkhwa (KP), Balochistan, Federal territory (Islamabad), the Federally Administered Tribal Areas (FATA), the Federally Administered Northern Areas (FANA) or Gilgit Baltistan. We employed convenience sampling to target the respondents (Sumaedi *et al.*, 2020a, b) because they were restricted to movement or in lockdown. This technique is common and has frequent usage in testing behavioural models (for instance, Sumaedi *et al.*, 2016; Sumaedi *et al.*, 2020a, b) online. We collected 240 samples in a raw shape (containing missing data and outliers). Finally, we applied 238 samples that fulfil SEM analysis (Hair *et al.*, 2010).

Representativeness and non-response bias

In the data collection modes, the representativeness and non-response bias assumptions are crucial and need for a good study (Saunders *et al.*, 2007; Soomro *et al.*, 2020). It is (non-response bias) is regarded as a common issue in survey research, frequently happening when respondents differ in a meaningful way from non-respondents (Armstrong and Overton, 1977; Churchill, 1979). In this respect, we dealt with non-response bias by certifying the overall population was sampled. To deal with excesses, a Mann–Whitney U test we conducted to compare early and late respondents (Lambert and Harrington, 1990; Weiss and Heide, 1993). We deemed the first 50 returned survey questionnaires as early respondents, while the last 50 returned questionnaires were considered as late respondents. As a result, there was no significant change (difference) between early and late respondents, and no non-response bias, as the results showed a significant value of all the variables was not < or equal to 0.5 probability (i.e. insignificant).

Measures

All the items of the scale were adapted from the literature of well-known field scholars. We applied a five-point Likert scale with the levels of 1 = extreme disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree and 5 = extreme agree.

Fear of COVID-19 (Fo19). Fo19 factor was assessed on seven-item fear of the COVID-19 scale, which highlights unidimensional psychometric properties. The scale was adopted from the study of Ahorsu *et al.* (2020), which is tested in the COVID-19 perspective. The sample

items of the scale are "I am most afraid of COVID-19" and "It makes me uncomfortable to think about COVID-19."

Attitudes towards a stay at home behaviour (AtSHB). AtSHB was measured on three items adapted from Bamberg *et al.* (2003), Peters and Templin (2010), Sumaedi *et al.* (2016) and Zhang *et al.* (2019). The sample items are "Stay at home during the COVID-19 pandemic is the right thing to do" and "I agree to stay at home during the COVID-19 pandemic".

Knowledge about COVID-19 (Ka19). Ka19 predictor was evaluated on six items. These items were taken from Kalichman and Simbayi (2003, 2004) and Kalichman *et al.* (2005). In COVID-19 situations, the same items were applied by Shah *et al.* (2020) to investigate the mask attitudes. The sample items of the scale are "An individual can get COVID-19 by touching someone with COVID-19" and "Washing hands after 10 min is helpful to protect against getting COVID-19".

Health consciousness (HC). This factor was also evaluated on six items as applied and modified by Shah *et al.* (2020). Initially, these items were originated by Gould (1988) and Abdulsahib *et al.* (2019a, b) and applied in HIV/AIDS perspectives. The sample items of the scale are "I reflect about my health a lot" and "I'm very self-conscious about my health".

Intention to stay at home (ItSAH). ItSAH is measured on three items adapted from Sumaedi *et al.* (2020a, b). These items are developed by Zeithaml *et al.* (1996), Peters and Templin (2010) and Liu *et al.* (2018). The sample items of the scale are "I intend to stay at home during the COVID-19 pandemic" and "I urge other people to stay at home during COVID-19 pandemic."

Data analysis

Descriptive statistics and correlation matrix

To determine the population trends of participants, we conducted descriptive statistics (Hair *et al.*, 1998). The mean values are observed (2.986–3.963 for Ka19 and HC, respectively). Further, maximum scores of standard deviation (1.134 = attitude towards staying at home behaviour) while minimum 1.023 (fear of COVID-19) were observed (Table 1). Besides, the correlation matrix showed the strength of the association among the variables (Hair *et al.*, 1998) as within the excellent scores, which showed the strong correlation among the all constructs (dependent and independent) (Table 1).

Measurement model

We conducted the factor loading to ensure the reliability (internal consistency) among the items of the respective factors. A majority of the items have appeared with the greater than 0.70 (or > 0.70) loadings scores except for fo19–6, ka19–5 and hc6. The items with loaded items with greater than 0.70 scores were considered excellent scores, as Hair *et al.* (2017) suggested and presented in Table 2. However, we excluded the items (fo19–6, ka19–5 and hc6) which did not load the above values of 0.70 (Hair *et al.*, 2017). Moreover, the composite

Variables	Mean	Std. deviation	1	2	3	4	5
1. Intention to stay at home	3.564	1.110	–				
2. Fear of COVID-19	3.350	1.023	0.304**	–			
3. Attitudes towards a stay at home behaviour	3.094	1.134	0.411**	0.320**	–		
4. Knowledge about COVID-19	2.986	1.129	0.580**	0.129*	0.178*	–	
5. Health consciousness	3.964	1.080	0.387**	0.321**	0.212**	0.432**	–

Table 1.
Descriptive statistics and correlation matrix

Note(s): *Correlation is significant at the 0.05 level (2-tailed), **Correlation is significant at the 0.01 level (2-tailed)

Construct	Item code	Factor loadings	CR	AVE	α
Fear of COVID-19	fo19–1	0.889	0.890	0.802	0.820
	fo19–2	0.872			
	fo19–4	0.859			
	fo19–3	0.827			
	fo19–5	0.809			
	fo19–7	0.792			
Attitudes towards a stay at home behaviour	atshb1	0.880	0.891	0.878	0.792
	atshb2	0.871			
	atshb3	0.853			
Knowledge about COVID-19	ka19–1	0.859	0.824	0.838	0.810
	ka19–2	0.830			
	ka19–3	0.802			
	ka19–6	0.792			
	ka19–4	0.781			
Health consciousness	hc1	0.892	0.889	0.847	0.822
	hc2	0.872			
	hc3	0.823			
	hc4	0.802			
	hc5	0.772			
Intention to stay at home	itsah1	0.823	0.842	0.813	0.738
	itsah3	0.802			
	itsah2	0.767			

Note(s): CR = composite reliability; AVE = average variance extracted values; α = Cronbach's alpha

Table 2.
Measurement model

reliability (CR) scores were observed to be in-between 0.824–0.891 or above 0.70 (Kline, 2010). Likewise, to evaluate an identity of the construct, average variance extracted (AVE) values were noticed in-between 0.802–0.878 for all variables of the model (>0.50) (Hair *et al.*, 2010). Finally, Cronbach's alpha (α) for all the individual variables was noted to be in-between 0.738 and 0.822 (Table 2). These ranges are regarded as suitable ranges (>0.70) (Nunnally and Bernstein, 1994).

Structural model

To check the fitness of the model and hypotheses assessment; the structural equation model (SEM) was conducted to get the relevant results from the data. The value of CMIN = χ^2/ chi-square is found to be 2.882. The other model fit indices such as the goodness-of-fit index (GFI = 0.942); adjusted goodness-of-fit index (AGFI = 0.907); normed fit index (NFI = 0.947); comparative fit index (CFI = 0.929) and root mean square error of approximation (RMSEA = 0.032) were found within the acceptable ranges (Table 3 and Figure 2).

Besides to assess hypothesized paths, standard error (SE), critical ratio (CR) and p-value were observed to approve or disapprove the strength of the impact of independent variables

	CMIN/df	GFI	AGFI	NFI	CFI	RMSEA
Model fit indicators	2.882	0.942	0.907	0.947	0.929	0.032
Suggested values	<3	>0.90	>0.90	>0.90	>0.90	<0.05

Note(s): CMIN = χ^2/Chi-square/df; df = degree of freedom; GFI = goodness of fit index; AGFI = adjusted goodness of fit index; NFI = normed fit index; CFI = comparative fit index; RMSEA = root mean square error of approximation

Table 3.
Model fit indices

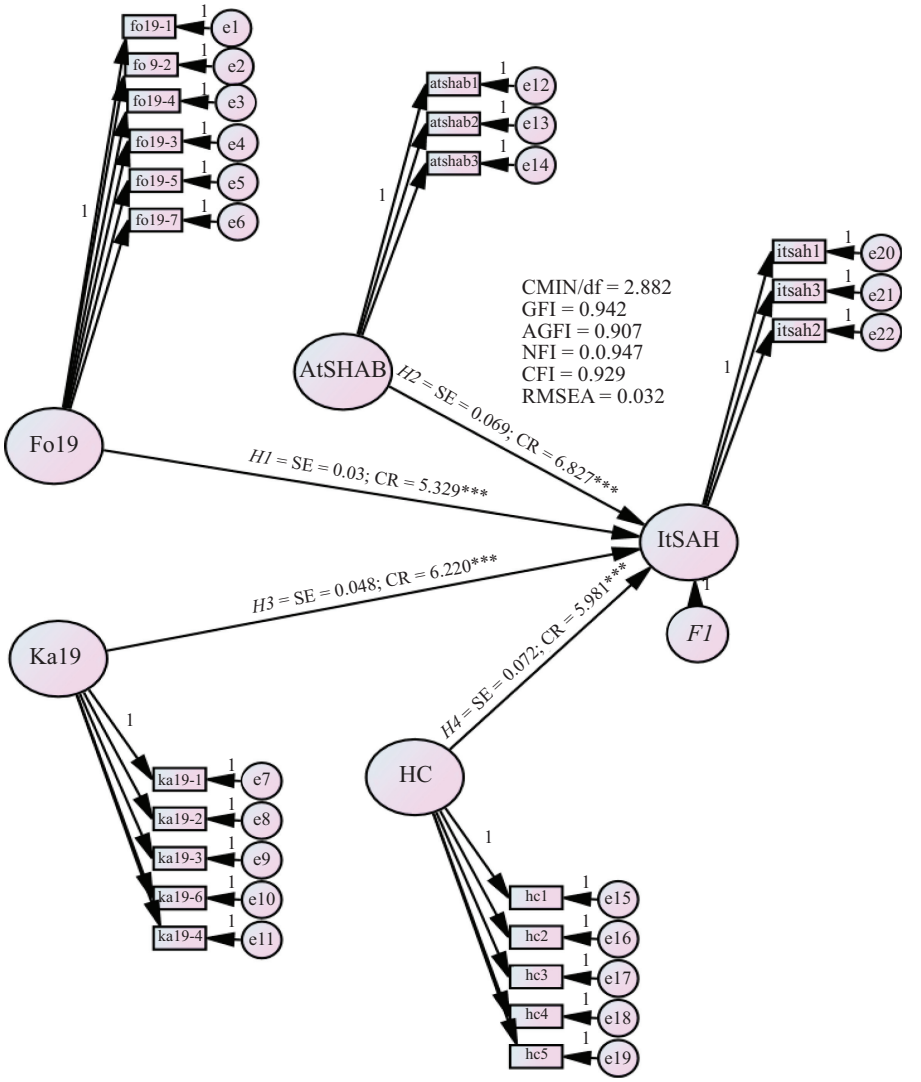

Figure 2.
Structural equation model

Note(s): Fo19, fear of COVID-19; AtSHB, attitudes towards a stay at home behaviour; Ka19, knowledge about COVID-19; HC, health consciousness; ItSAH, intention to stay at home

on the dependent variable (Sullivan and Feinn, 2012). The scores of SEM accepted the H1, by underlining the significant positive impact of fear of COVID-19 on the ItSAH (SE = 0.032; CR = 5.329***; $p < 0.01$) (Figure 2 and Table 4). We found a positive and significant effect of AtSHB on the ItSAH (SE = 0.069; CR = 6.827***; $p < 0.01$) (Figure 2 and Table 4). The occurrence of these values accepted the H2. Further, the analysis also found a significant positive effect of Ka19 on the ItSAH (SE = 0.048; CR = 6.220***; $p < 0.01$) (Figure 2 and

Table 4). Henceforth, H3 is accepted. Finally, according to our expectations, the positive and significant effects of HC was appeared to be on the ItSAH (SE = 0.072; CR = 5.981***; $p < 0.01$) (Figure 2 and Table 4). As a result, H4 is also supported.

Discussion and conclusion

The purpose of the present study was to examine the ItSAH due to COVID-19. We conducted the survey after an appearance of the second wave of the pandemic. The investigation found a positive and significant influence of fear of COVID-19 on ItSAH (H1 accepted). These results are consistent with the previous studies like Huang *et al.* (2020) and Guan *et al.* (2020) who found the fear of COVID-19 distressed and bring anxiety among the people. Besides, these results are in line with Shah *et al.* (2020) who found fear of COVID-19 as a significant predictor of mast purchase attitudes. These results underline that the second wave of COVID-19 brought a lot of fear, which limited or restricted the people at their home. The fear factor has been proved significant in developing citizen intention to stay in their homes. This fear arose from a probable infection of COVID-19 (Li *et al.*, 2020). The citizens are frightened of severe and deadly effects. Maybe the fear has been developed among the citizens due to transmission as fear is directly associated with the transmission rate (Pappas *et al.*, 2009).

Our study confirmed a positive and significant effect of AtSHB on the ItSAH (H2 supported). These outcomes also concur with Ajzen (1991), Chan and Tsang (2009), Dumitrescu *et al.* (2011), Soomro and Shah (2015) and Zhang *et al.* (2019) who confirmed the attitudes as the significant analyst of intention in the different and business domains. More recently, in the COVID-19 pandemic outlook, Shah *et al.* (2020) found a significant and positive correlation between mask attitudes and purchase intentions in Pakistan. Also, Sumaedi *et al.* (2020a, b) supported the findings with the claim of empirical evidence of positive linkages between AtSHB and ItSAH during the COVID-19 pandemic. In such a situation, citizens of Pakistan considered staying at home as the right decision to stay at home to prevent their self from the pandemic. They agreed and liked to follow the government instructions to remain at home. Besides, they have also provided suggestions to other people who were not following the stay at the home recommendation of the government of Pakistan. The positive outcomes of stay at home were also communicated with each other by the responsible citizens of Pakistan.

Further, our results also found a significant positive effect of knowledge and HC about the COVID-19 on the ItSAH (H3 and H4 supported). These findings are also parallel with many scholars like Abdulsahib *et al.* (2019a, b), Maheshwari *et al.* (2020) and Shah *et al.* (2020) who found both knowledge and HC as the significant forecaster of attitudes and intentions. They are believed that health is a basic need of every human, which should be enjoyed in the right way (Shah *et al.*, 2020). In such a sense, the citizens of Pakistan know the effects of COVID-19,

H. No	Independent variables	Path	Dependent variable	Estimate	SE	CR	p	Decision
H1	Fear of COVID-19	→	Intention to stay at home	0.224	0.032	5.329	***	Accepted
H2	Attitudes towards a stay at home behaviour	→	Intention to stay at home	0.224	0.069	6.827	***	Accepted
H3	Knowledge about COVID-19	→	Intention to stay at home	0.382	0.048	6.220	***	Accepted
H4	Health consciousness	→	Intention to stay at home	0.320	0.072	5.981	***	Accepted

Note(s): SE = standard error; CR = critical ratio; p = significance level; ***$p < 0.05$

Table 4.
SEM estimations

as they think that an individual can be affected if he/she may share someone's kitchens and bathrooms of those who are the victim of COVID-19. They also acknowledge that washing of hands every 10 min and avoid touching any person or thing are the effective cures to be safe from COVID-19. Besides, they should even be very careful about their health. They take their responsibility to avoid extra movement and conscious of protecting their good health. This significant carefulness (knowledge and health) diverted their ItSAH to protect themselves from the infectious pandemic.

In a nutshell, overall findings of the study show a positive and significant effect of fear of COVID-19, attitudes stay at home, Ka19 and HC on the ItSAH. These findings would provide the ways for the government for developing other policies which may create the sense of citizens to stay at home. This strategy would be proven as a powerful tool to fight and reduce the ratio of COVID-19. This would also reduce the further spread of such deadly pandemic.

Implications, limitations and future research paths

Nowadays, COVID-19 is a global problem, which needs serious concentration to tackle the issue. Presently, there is the unavailability of a vaccine and an effective cure. The only prevention optimism can avert and evade it. The behaviours of citizens become crucial to smooth the curve and condense the impact of a pandemic. Nevertheless, an investigation that explored citizens behaviour associated with COVID-19 anticipation was enormously limited. We decided to conduct the study as we heard the entrance of the second wave of the COVID-19 in Pakistan officially. This lethal wave has brought more than 3,000 coronavirus cases, which swallowed the 59 people within the initial 24 h. In this regard, the study offers several contributions. The study has filled the gap by designing and testing a model that enlightens the ItSAH during the COVID-19 pandemic. In a pandemic situation, if individuals had the means to stay at home and perceived no substantial obstructions to do it, they would be further probably to follow to the stay at the home assumption. The study was conducted in Pakistan, where the poverty threat was more gripping and real. The stay at the home of individuals may hover their income sources. As a result, individuals line up financial threats over the risk of COVID-19. Individuals chosen to confront such the assumption due to threat of COVID-19 was not convincing enough associated with poverty and hunger. The results of an investigation would be beneficial for government and policymakers to know further the role of fear and Ka19, AtSHB and HC towards the development of ItSAH. The government would formulate the policy regarding the positive intentions of COVID-19 preventions as the citizen can responsibly follow the instructions. Finally, the study outcomes would enrich the literature of COVID-19 particular for the development of intentions.

There are some limitations associated with the study due to its completion in a developing context. The study examines the citizens' intentions to stay at home during a second wave of COVID-19 in Pakistan. The study is restricted to limited samples who are the ordinary citizens of Pakistan. The study is restricted to only an online survey through a convenience sampling. In the study, only variables such as fear, knowledge, attitudes and HC about COVID-19 are used as predictors of intentions to stay at home. We did not underpin our study to any theory, but only one variable (attitude) is chosen for investigation from the TPB theory. The study is restricted to quantitative methods based on cross-sectional data. In future, there is a dire need to conduct longitudinal studies in order to compare the individuals' attitudes and intentions in first, second or third waves of COVID-19. Mixed methods should be employed to strengthen the findings of the study further. More sample size should be considered in future. Finally, other modes and techniques of data collection may be applied in future. The theoretical framework should be underpinned with concerned theories in future.

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Differences in tobacco smoking status in segments of the Australian population

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Abstract

Purpose – The purpose of this study is to identify correlates of tobacco smoking behaviour across various socio-demographic segments of the Australian population.

Design/methodology/approach – Data from two nationally representative, probability samples of persons 18 and over, surveyed by the Australian Bureau of Statistics in 2001 and 2017–2018 were analysed using multinomial logistic regression.

Findings – Overall, the prevalence of current smokers declined from 24.3 to 15%. More than half of the population had never smoked. The prevalence of ex-smokers increased slightly to 30%. Prevalence of current smoking was higher among older age groups and among those with lower educational achievement, lower income, living in a disadvantaged area and experiencing increasing stress. Females were more likely than males to be never-smokers. Males were more likely than females to be current smokers.

Research limitations/implications – The findings are based on two cross-sectional surveys conducted 17 years apart. It is not possible to draw any conclusions about the actual trajectories of the changes in the values reported or any correlations between those trajectories. Nor is it possible to make any meaningful forecasts about likely future trends in smoking status in these various segments based on these data sets. The classifications used in the surveys generate some heterogeneous groups, which can obscure important differences among respondents within groups. Data are all self-reported, and there is no validation of the self-reported smoking status. This might lead to under-reporting, especially in a community where tobacco smoking is no longer a majority or even a popular habit. Because the surveys are so large, virtually, all the findings are statistically significant. However, the increasing preponderance of never-smokers in many categories might mean that never-smokers could come to dominate the data.

Practical implications – The findings from this paper will help tobacco-control policy-makers to augment whole-of-community initiatives with individual campaigns designed to be more effective with particular socio-demographic segments. They will also assist in ensuring better alignment between initiatives addressing mental health and tobacco smoking problems facing the community.

Originality/value – The examination of smoking behaviour among individual population sub-groups, chosen by the authors, is commonplace in the literature. This paper uses data from two large surveys to model the whole, heterogeneous population, measured at two different points in time.

Keywords Australia, Tobacco, Smoking, Socio-demographic, National Health Survey

Paper type Research paper

Introduction

This paper draws on the principles first set out by Andreasen (1994) nearly 30 years ago but that have been constantly reaffirmed in health education and social marketing literature ever since: populations are very rarely homogeneous. Giving them a label such as "smokers" or "ex-smokers" does not, of itself, tell us much useful information about an individual in the group nor does it help us to understand how to influence the individual to change their behaviour. This is not such an issue when the problem is widespread and there is a large "common ground." A single message, properly framed, can influence a large number of the "common" ground, and the smaller, usually disparate, groups who are not influenced by the

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message can be ignored. It becomes a problem when only the smaller groups who, for whatever reason, have not been influenced by the common message – often because it is seen to be irrelevant or objectionable to them, are left. These smaller groups can then form cells from which the problem re-emerges. It is essential to address each of these smaller groups, understand their situation and to produce carefully adapted approaches to reach them. In the words of Andreasen and most other health educators, it is necessary to segment the market. This approach can be seen in Barnet *et al.* (2011) and Langdon *et al.* (2020) for example.

Despite the prevalence of current smokers in Australia being at very low levels, tobacco smoking continues to do significant, avoidable damage to the Australian community.

Lung cancer remains the fourth most common cause of death in the country. It accounted for 5.3% of all deaths in Australia in 2015 (ABS, 2015). It is the fifth most commonly diagnosed cancer in this country (Cancer Australia, 2020) but it is by far the biggest cause of cancer deaths and it is strongly associated with tobacco smoking, worldwide. The American Cancer Society estimates that tobacco smoking directly accounts for at least 80% of lung cancer cases and "many others are caused by exposure to secondhand smoke". (American Cancer Society, 2020). Pandeya *et al.* (2015) estimated that 81% of all lung cancers in Australia were directly attributable to tobacco smoking.

The Australian Institute of Health and Welfare (AIHW) report that the fifth leading cause of death in Australia is chronic obstructive pulmonary disease (COPD), accounting for 4.5% of deaths in 2018. The AIHW notes that this is only the cases where COPD is listed as the underlying cause of death. There were a further 7.2% of deaths where COPD was listed as an associated cause of death (AIHW, 2018). Most authorities, including the AIHW and the World Health Organisation (WHO), concur that "The primary cause of chronic obstructive pulmonary disease (COPD) is tobacco smoke (including second-hand or passive exposure)" (WHO, 2020). There is also extensive research linking tobacco smoking to other harmful conditions. For example, Hunter *et al.* (2020) found a strong link between tobacco smoking during pregnancy and the onset of schizophrenia and other mental illnesses. They caution that more work needs to be done to establish a causal link identified in what is largely observational and not experimental research.

Australian governments have responded to community pressure and taken aggressive steps to reduce tobacco consumption. These steps have included steep increases in price through the application of excise taxes, limiting availability and display of tobacco products, prohibiting sale of tobacco products to minors, banning smoking from a wide range of public and work spaces, banning the advertising and promotion of tobacco products, enforcing plain packaging for tobacco products and enforcing the inclusion of large, graphic warning messages on all tobacco packaging. Tobacco warnings are incorporated in all school health curriculums. Governments and the not-for-profit sector support public education programmes to encourage young people to resist commencing smoking and, if they have commenced, to quit. Large pharmaceutical companies like Johnson and Johnson and GSK actively promote products that assist in quitting smoking, and there is widespread promotion of the significant health benefits that rapidly follow cessation. A typical example is the "fact sheet" published by the Health Department of the New South Wales Government, which shows a timeline of typical improvements in health following successful cessation (NSW Government, 2020).

All of these initiatives send the same, undifferentiated messages across the whole community. This paper suggests that there are distinct segments of the population where the messages are not equally effective and there is a need to differentiate the messages to be more effective with these segments.

The examination of smoking behaviour among individual population sub-groups, chosen by the authors, is commonplace in the literature. For example, Twyman *et al.* (2016) examined alcohol and tobacco consumption among a sample of economically disadvantaged people. Bonevski *et al.* (2014) looked at patterns among larger groups but not whole populations.

Other papers that examine segmentation within selected segments of a population include Hwang and Park (2019), which focuses on gender differences in a large sample, Low *et al.* (2019), which examines the effectiveness of "expert defined segmentation" in the context of healthcare, Primack *et al.* (2012), which focuses on US university students, and Nighbor *et al.* (2018), which looks at smoking patterns among women of reproductive age in rural and urban US papers that specifically focus on demographic segments within a population include Banks *et al.* (2015), which identifies changes in segments of an ongoing cohort study. Bloem *et al.* (2020) segmented consumers of healthcare services on the basis of psychological determinants, and Kaleta *et al.* (2012) explored socio-demographic determinants of tobacco smoking in Poland, drawing on data from a large, global survey. Papers such as Langton *et al.* and Barnet *et al.*, mentioned above, are exceptions, in that they explore the use of segmentation in the design of health-related initiatives.

This paper employs the approach used in Yusuf and de Meyrick (2020), Sharbaugh *et al.* (2018) and others to model whole, heterogeneous population, measured at different points in time.

Smoking prevalence at any time is the sum of prevalence at the beginning of the period, plus those who have commenced smoking, minus those who have quit or died. One of the key factors in commencing smoking is "peer pressure". This influence has been shown in many papers, including Boutress *et al.* (2016) and Varela and Pritchard (2011). It has also been found in populations as culturally and geographically different as Finland and Russia (Aura *et al.*, 2016) and Ethiopia (Leshargie *et al.*, 2019).

Data and methods

All the findings presented in this paper are based on two National Health Surveys (NHSs) conducted by the Australian Bureau of Statistics (ABS) during February to November 2001 (NHS 2001) and July 2017 to June 2018 (NHS 2017–2018). Both surveys covered private dwellings in all states and territories of Australia, excluding the very remote areas that accounted for less than 1% of the total population in the 2001 and 2016 censuses. Multistage probability sampling procedures were used to ensure that within each state or territory each person had an equal chance of selection. The number of private dwellings selected was 17,918 and 16,384 in the two surveys, respectively. In both surveys, information was obtained about one adult (18 years and older) and a certain proportion of children under 18 (first survey: all children 0–6 and one 7–17; second survey: one child 0–17). Questions on tobacco smoking were only asked of respondents aged 18 years and over.

Authors were provided confidentialised unit records for each adult interviewed in the two surveys, along with weighting factors to derive national estimates of 14.181 million adults in the first survey and 18.655 million in the second survey. In addition, 60 replicate weights were also provided for each record to enable the estimation of appropriate relative standard error (RSE) for each estimate (more detail relating to sampling procedure, sample characteristics and other statistical information can be found at ABS, 2003, and ABS, 2019).

SPSS25 was used for analysis throughout and included cross-tabulations between the dependent variable (smoking status) and selected socio-demographic characteristics followed by the generation of three multinomial logistic regression models. This paper focuses on the model using *Never smoked* as the reference dependent variable. The alternative models are available if required. In each of the independent variables, the reference category is the one shown first in the table.

For analytic purposes, there are three categories of the dependent variable, smoking status:

(1) Current smoker: Includes all people who smoke daily, weekly and less than weekly up to one year.

(2) Ex-smoker: Includes all people who used to be current smokers but who have not smoked in the last year.

(3) Never smoked: Includes all people who have never been a current smoker.

There are eight independent variables:

(1) Age group: As smoking-related questions were not asked of respondents under 18 years of age, the youngest age group consists of respondents aged 18–24 years. These are followed by four ten years age groups and a final 65+ group.

(2) Gender: The analysis follows the ABS practice of recording responses as either male or female.

(3) Highest post-school qualification: There are three categories of qualification:

- Bachelor's degree or higher;
- Undergraduate certificates and diplomas; and
- No post-school qualification.

(4) Income quintile: The income distribution is calculated separately for each survey.

(5) Kessler K10 Distress Scale: Distress level (K-10) was calculated by the ABS using a set of ten standard questions asked in both surveys as to how often the respondent felt during the past four weeks: tired out for no good reason, nervous, so nervous that nothing could calm down, hopeless, restless or fidgety, so restless could not sit still, depressed, everything was an effort, so sad that nothing could cheer up and worthless. Responses were pre-coded as: (5) all of the time, (4) most of the time, (3) some of the time, (2) a little of the time and (1) none of the time. Theoretically, the K-10 could only vary between 10 and 50 for each respondent, with a higher score indicating greater distress. (For more information regarding interpretation of the K10 scale and its evaluation, see Andrews and Slade 2001; Furukawa *et al.*, 2003.) The ABS groups the scores as follows:

- Low levels of distress (10–15);
- Moderate levels of distress (16–21);
- High levels of distress (22–29); and
- Very high levels of distress (30–50) (ABS, 2019).

(6) IRSD refers to the Index of Relative Socio-economic Disadvantage, a general socio-economic index calculated by the ABS that summarises a range of information about the economic and social conditions of people and households within an area, expressed in terms of relative disadvantage (ABS, 2019).

(7) Employment status: There are three categories of employment status:

- Employed: Includes all people currently in paid employment.
- Unemployed: Includes all people not currently in paid employment but looking for paid employment.
- Not in the labour force: Includes all people not in paid employment and not looking for paid employment.

(8) Occupation: The analysis follows the convention of describing lower socio-economic status and manual occupations as "blue collar" and other occupations as "white collar". Respondents' occupations have been grouped into three categories:

- Administration and professional;
- Other white colour; and
- Blue collar.

Findings

Population characteristics

The table in Appendix shows the weighted estimates of the population characteristics based on the two surveys. The general distributions of the various demographic characteristics in this study have remained constant between the surveys. There are two exceptions. The Australian population continues to age, the average age increased from 33.6 years in the first survey to 45.8 years in the second. The policies of successive governments to encourage more people to complete degrees are reflected in the increase in the proportion of the population, with at least an undergraduate degree from 15.6% in the first survey to 29.2% in the second.

Smoking status

The proportion of the total population who reported that they were current smokers at the time of the survey declined from 24.3 ± 0.4% in the 2001 survey to 15.2 ± 0.3% in the 2017–2018 survey.

Gender differences

Figure 1 shows the prevalence of the three smoking statuses by gender in the adult population as recorded in the two surveys. It shows that current smoking prevalence was higher among males than among females. Among males, it declined from 27.6 ± 0.7% in 2001 to 18.3 ± 0.4% in 2017–2018. Among females, the decline was from 21.1 ± 0.5% to 12.3 ± 0.3% – a proportionally larger decline. The prevalence of ex-smokers among males was higher than among females and increased in both genders between the two surveys. In males, the increase was from 30.4 ± 0.7% in 2001 to 34.6 ± 0.6% in 2017–2018. Among females, the increase was from 22.5 ± 0.4% in 2001 to 25.5 ± 0.6% in 2017–2018. The largest group in both genders and both surveys was those who never smoked. Among males, the prevalence increased from

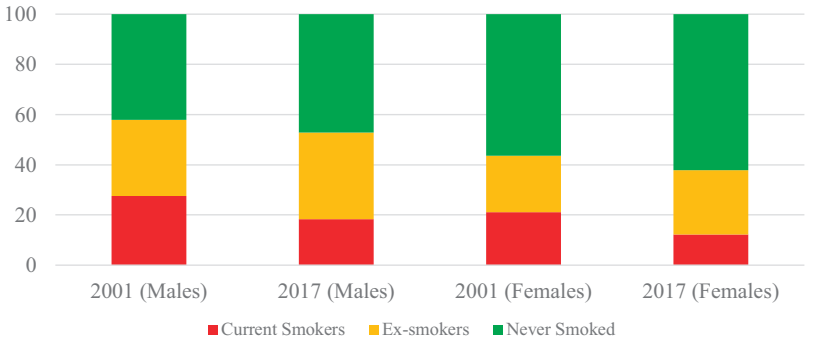

Figure 1.
Percentage of Australian adults by gender and smoking status: NHS 2001 and 2017

42.0 ± 0.7% in 2001 to 47.1 ± 0.7% in 2017–2018. Among females, the prevalence of never-smokers is more than twice that of the next largest group (ex-smokers), and the gap widened between the surveys. In 2001, 56.4 ± 0.7% of females reported that they had never smoked. In the 2017–2018 survey, the proportion had increased to 62.2 ± 0.6%.

Age group differences

Figure 2 show that there were reductions in the prevalence of current smokers in each age group, especially the youngest group where the percentage nearly halved from 31.3 ± 1.4% in 2001 to 16.7 ± 0.9% in 2017–2018.

This reduction in the overall prevalence of current smokers is the result of two significant trends:

(1) Prevention: Figure 2 also indicates that fewer young people were taking up smoking. The proportion of respondents who reported that they have never smoked was the largest category in each age group in each survey and has shown steady growth. The proportion of all respondents who reported that they had never smoked grew from 49.4 ± 0.5% in the 2001 survey to 54.8 ± 0.4% in 2017–2018. The largest increase was among the youngest age groups where the never smoked proportion of 18–24-year-olds increased from 57.3 ± 1.6% in the 2001 survey to 73.6 ± 1.3% in the 2017–2018. In the 2001 survey, the percentages were relatively stable around the population average, while in the 2017–2018 survey, a clear age gradient emerged with a steady decline from the youngest to the 55–64-year-old group.

(2) Cessation: An increasing proportion of people who do commence daily smoking are succeeded in quitting and became ex-smokers. Overall, despite fewer people taking up smoking (i.e. remaining never smokers), the proportion of them who are quitting is increasing so that the prevalence of ex-smokers has slightly increased in the population. There was an increase of approximately 3 or 4 percentage points in each age group with the exception of the youngest group. In the 2017–2018 survey, the second largest category in all, but the youngest age group was ex-smoker.

Multinomial logistic regression

Table 1 shows the multinomial logistic regression odds ratios calculated using data from the 2001 and 2017–18 NHSs. In each case, the dependent variable was smoking status. The reference was Never Smoked and the categories were current smoker and ex-smoker. In each independent variable, the reference was the first category.

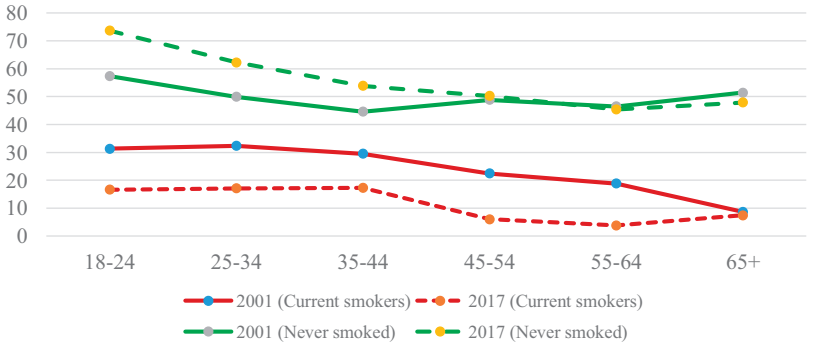

Figure 2.
Age specific rates per 100 Australian adults by smoking status: NHS 2001 and 2017

	NHS 2001 (Nagelkerke $R^2 = 0.155$)		NHS 2017–18 (Nagelkerke $R^2 = 0.197$)	
	Current smoker	Ex-smoker	Current smoker	Ex-smoker
Age group				
18–24	1.000	1.000	1.000	1.000
25–34	1.448 (1.481–1.495)	1.873 (1.862–1.884)	1.887 (1.877–1.896)	2.817 (2.801–2.832)
35–44	1.605 (1.597–1.612)	3.084 (3.066–3.102)	2.318 (2.306–2.330)	4.570 (4.545–4.594)
45–54	1.087 (1.082–1.093)	3.111 (3.093–3.129)	2.343 (2.331–2.355)	5.195 (5.167–5.223)
55–64	0.848 (0.843–0.852)	3.760 (3.737–3.783)	2.163 (2.151–2.175)	7.133 (7.094–7.171)
65+	0.332 (0.330–0.334)	3.791 (3.767–3.783)	0.862 (0.857–0.868)	8.434 (0.857–0.0.868)
Gender				
Females	1.000	1.000	1.000	1.000
Males	1.800 (1.795–1.806)	1.936 (1.930–1.941)	2.093 (2.087–2.099)	1.894 (1.890–1.898)
Highest qualification				
Bachelor's degree or higher	1.000	1.000	1.000	1.000
Certificate/diploma	1.907 (1.898–1.917)	1.539 (1.533–1.546)	2.839 (2.827–2.852)	1.820 (1.815–1.826)
No post-school education	2.144 (2.134–2.155)	1.315 (1.309–1.321)	3.028 (3.014–3.041)	1.454 (1.449–1.459)
Employment status				
Employed	1.000	1.000	1.000	1.000
Unemployed	1.494 (1.483–1.505)	1.046 (1.037–1.055)	0.981 (0.955–1.008)	2.209 (2.143–2.276)
Not in the labour force	1.179 (1.173–1.184)	1.149 (1.144–1.154)	0.618 (0.602–0.634)	2.006 (1.948–2.065)
Occupation group				
Administrator/ professional	1.000	1.000	1.000	1.000
Other white collar	1.184 (1.178–1.189)	1.137 (1.132–1.142)	1.183 (1.177–1.188)	1.192 (1.188–1.196)
Blue collar	1.612 (1.605–1.619)	1.047 (1.042–1.052)	1.314 (1.308–1.1.320)	1.041 (1.038–1.045)
Income quintile				
Q1 (Lowest 20%)	1.000	1.000	1.000	1.000
Q3	0.626 (0.623–0.630)	0.977 (0.973–0.982)	0.785 (0.781–0.789)	0.918 (0.914–0.922)
Q5 (Highest 20%)	0.638 (0.634–0.641)	0.956 (0.951–0.961)	0.698 (0.694–0.702)	1.016 (1.011–1.020)
K-10 distress category				
Low distress	1.000	1.000	1.000	1.000
Moderate distress	1.445 (1.440–1.450)	1.222 (1.218–1.226)	1.617 (1.611–1.622)	1.226 (1.222–1.229)
High distress	1.729 (1.722–1.737)	1.057 (1.052–1.062)	2.448 (2.438–2.2.459)	1.268 (1.263–1.274)
Very high distress	2.101 (2.086–2.115)	1.176 (1.167–1.185)	4.773 (4.744–4.802)	1.899 (1.887–1.911)
IRSD# Quintile				
Q5 Most disadvantaged (20%)	1.000	1.000	1.000	1.000
Q3	0.727 (0.724–0.730)	1.024 (1.020–1.029)	0.759 (0.758–0.763)	1.031 (1.027–1.034)
Q1 Least disadvantaged (20%)	0.525 (0.523–0.528)	0.878 (0.874–0.882)	0.481 (0.479–0.684)	1.009 (1.006–1.013)

Table 1.
Odds ratios and 95% confidence intervals (in parentheses) for multinomial logistic regression models – reference smoking status: never smoked

Note(s): #Index of relative socio-economic disadvantage

Of the nine independent variables included in the final model, six are good predictors of smoking status: age, gender, highest qualification, income quintile, Kessler distress category and IRSD.

(1) Age group

By the time of the 2017–2018 survey, a clear age gradient emerged. At the time of the 2001 survey, the odds of a young person being a current smoker rather than never having smoked were not very different for all except the oldest group. They ranged from a high of 1.605 among 35–44-year-olds to 0.848 among the 55–64-year-olds. In the intervening period, young people have been avoiding commencing smoking at an accelerating rate, so the odds of them being never smokers in the 2017–2018 survey are the highest of any age group and the odds of them being a current smoker rather than never smoking are approximately half those of the other age groups – except the oldest – and have increased in all age groups. The biggest change was among the 55–64-year-olds where the ratios increased from 0.848 to 2.163. Higher mortality among smokers results in the likelihood of those in the 65+ age group being current smokers rather than never smoked being lower than among the youngest, reference, group in both surveys but had increased significantly in the 2017–2018 to 0.862 from 0.332 in 2001.

The efficacy of quitting smoking and the various "Quit" campaigns mounted by governments and pharmaceutical companies mentioned above is shown in the growth in the likelihood of a respondent being an ex-smoker rather than never having smoked in the older age groups. There is a clear age gradient in the 2001 survey, with ratios increasing steadily from 1.873 for 25–34-year-olds. In the 2017–2018 survey, the gradient increased markedly so that ratios increase steadily from 2.817 for 25–34 years to 8.434 for those aged 65 plus.

(2) Gender

When compared with males, females are much more likely to remain never smokers. The likelihood of a male taking up smoking and either subsequently continuing to smoke or to successfully quit are approximately twice those of a female. Of concern is the increase in the likelihood that males will continue to be current smokers rather than never having smoked from 1.8 in the 2001 survey to 2.093 in the 2017–2018 survey and decrease in the likelihood that they will successfully quit from 1.936 to 1.894 compared with females.

(3) Highest qualification

An increase in education attainment is associated with an increased likelihood of remaining a never smoker, and the differences increased between the two surveys. In the 2001 survey, respondents who had completed a post-school certificate or diploma were approximately twice as likely as a person with a bachelor's or higher qualification to be a current smoker rather than have never smoked (OR 1.907). In the 2017–2018 survey, the odds ratio had increased to 2.839. On the positive side, there was a slight increase in the likelihood that they had successfully quit and become ex-smokers (OR increased from 1.539 to 1.820).

Those with no post-school qualification remain the most likely to be current smokers rather than have never smoked. The odds ratio increased from 2.144 in 2001 to 3.028 in 2017–2018 with a smaller but positive increase in the odds of being an ex-smoker from 1.315 to 1.454.

(4) Income quintile

Income quintile is a strong indicator of current smoking status in both surveys. When compared with those in the lowest income quintile, those in higher income groups are significantly less likely to be current smokers rather than have never smoked. In the 2001 survey, the odds ratios range from 0.75 for those in Q2 (the second lowest income quintile) to 0.638 for those in Q5. There was a slight increase in the ratios in the 2017–2018 survey but the lowest income quintile remain the most likely to be current smokers rather than never smoke. The ratios range from 0.841 for Q2 to 0.698 for Q5. There is no difference in the likelihoods of any income groups successfully quitting and becoming ex-smokers and there was no

significant change in the odds ratios between surveys. They continued to be clustered around 1.0.

(5) Kessler distress category

Kessler distress category is a strong indicator of current smoking status, and the gradient increased between the two surveys. In the 2001 survey, a person reporting moderate distress was 1.445 times more likely to be a current smoker rather than never smoked compared with a person reporting low distress A person reporting very high distress was 2.101 times as likely. In the 2017–2018 survey, the range had increased from 1.617 for those reporting moderate distress to 4.773 for those reporting very high distress.

(6) Index of relative socio-economic disadvantage (IRSD)

Relative socio-economic disadvantage is a strong indicator of current smoking status. As the level of relative disadvantage increases, the likelihood that a person will be a current smoker rather than never having smoked increases so that a person living in a least disadvantaged area is only half as likely as a person living in the most disadvantaged areas to be a current smoker. The gradient has remained approximately the same across the two surveys. In the 2001 survey, the likelihood that a person living in an area classified as Q4 (the second most disadvantaged category) would be a current smoker rather than having never smoked was 0.817 times that of a person in Q5 (the most disadvantaged) and the ratio for a person in Q1 was 0.525. In the 2017–2018 survey, the corresponding ratios were 0.895 and 0.481. There is no clear relationship between level of disadvantage and the likelihood of being an ex-smoker as the odds ratios in each quintile and both surveys remained close to 1.0.

(7) Employment status

The ratios relating to employment status changed significantly in the interval between the two surveys. In 2001, those who were unemployed were more likely to be current smokers than those in employment (OR 1.494) and not significantly different from those in employment when it can to being ex-smokers (OR 1.046). In 2017–2018, the unemployed were slightly less likely than the employed to be current smokers (OR 0.981), and the likelihood of being an ex-smoker compared with those in employment had doubled (OR 2.209). The change in ratios among those not in the labour force were more pronounced. The likelihood of being a current smoker rather than never having smoked decreased from 1.179 in 2001 to 0.618 in 2017–2018 and, as with the unemployed, the likelihood of being an ex-smoker nearly doubled from 1.149 to 2.006.

(8) Occupation

Occupation groupings did not provide clear gradients in the likelihood of being in different smoking status groups in either survey and with the exception of those in blue-collar occupations, the ratios did not change significantly. The ratios for those in other white-collar occupations being current or ex-smokers compared with those in administrative and professional occupations remained close to 1.2 in both surveys. In the 2001 survey, the likelihood of a person in a blue-collar occupation being a current smoker was 1.612 times that of a person in an administrative or professional occupation. In the 2017–2018 survey, the ratio had reduced to 1.314.

Discussion

Overall, these findings indicate that Australia continues to make progress in the reduction of tobacco smoking prevalence in the community. Of particular importance is the strong increase in the proportion of younger people who avoid taking up the habit and an almost

halving of the prevalence of current smokers in the 18–24-year-old group. As D'Angelo *et al.* (2016), Primack *et al.* (2012) and many others have found, the mean age of commencing tobacco smoking is in the mid to late-teens and typically, in excess of 95% of smokers commenced smoking before the age of 25 (see, e.g. Figure 1 in Marcon *et al.*, 2018). This suggests that there is every reason to believe that smoking prevalence in the community will continue to decline as these people will remain tobacco-free for the rest of their lives.

There are two possible explanations for the reversal of the age gradient in the likelihood of being a current smoker so that the lowest odds are among those in the oldest age group. Firstly, higher mortality among smokers means that there are fewer current smokers still alive in a position to take part in the surveys, so the prevalence of current smokers in the 65+ age group is very low and the proportion of respondents in the group who never smoked is higher. Secondly, the fact that the body typically begins repairing the damage done by smoking rapidly after a smoker successfully quits, as well as the impact of the various "Quit" campaigns mounted by governments and pharmaceutical companies also helps to explain the higher prevalence of ex-smokers in this age group.

The growth in the proportion of young people remaining non-smokers might be attributable to the interaction of two factors. The efficacy of anti-smoking initiatives has been mentioned above. In addition, as also mentioned above, the main reasons people give for taking up smoking include "peer pressure" and imitating significant adults or a badge of adulthood. Once the prevalence of tobacco smoking drops to very low levels, this peer pressure and adult role-models become less powerful. This suggests that it remains essential that these initiatives be maintained and also that it might be appropriate to explore initiatives directed at these young people, which shift from a preventative approach, with a focus on the long-term health costs of tobacco-smoking (which might be irrelevant or unfamiliar to young people) to a focus on the more immediate social inclusivity and belonging benefits, which might have more salience for young people. At the same time, the strong growth in the prevalence and odds of smokers successfully quitting and becoming ex-smokers suggests that the current shocking, health consequences approach continues to be effective with smokers and should be maintained with this segment.

Taken together, several of these findings suggest that there is still a widespread, if unconscious, belief that tobacco-smoking eases stress, "calms the nerves". Tobacco smoking is generally more prevalent and more tenacious (as shown by the comparative lack of successful quitting and becoming an ex-smoker) in situations that are associated with more stress.

This is most evident in the increased current smoking prevalence among those assessed as being under greater stress as measured by the Kessler 10, but these findings suggest that the association is just as strong in some of the potential causes of this stress. In each case, an increase in stress is associated with an increased likelihood of being a current smoker. The relationship might be complex than it seems. While many other authors (e.g. Yusuf and de Meyrick, 2020) have found a similar association between increased stress and increased prevalence of current smokers, Muhkerjee *et al.* (2016) found that the stress following two deadly US cyclones was associated with current smokers smoking more, but it was not associated with an increase in smoking initiation. This would result in an increase in smoking but not an increase in prevalence. Further research is necessary to further understand the relationship.

Increased current smoking prevalence is associated with lower levels of academic qualification, and this might be very stressful for a person who believes that they are at a significant disadvantage when competing for a job against others who are seen to be more qualified. With increasing emphasis on qualifications across the community, these individuals will feel increasingly excluded from work. The same applies to those earning lower incomes. Their budgets are under increasing pressure, and in the current economic

environment, there seems to be no imminent prospect of their situation improving. It is possible that they do not have the resources or the opportunity to better equip themselves to generate more income and reduce their stress. In addition, there is always a "churn" in occupations as some are no longer needed (e.g. garage forecourt attendants), are replaced by robotics or outsourced, or are changed so much that current practitioners are no longer qualified. Furthermore, it is occupations at the less-skilled end of the scale that are most vulnerable to disappearing. This is very stressful for the individual who is not in a position to reequip themselves. In general, the new occupations are require higher qualifications or specialist skills that the displaced person might not have.

The prevalence of these and other factors within a community is summed up by its IRSD, and here too, increased disadvantage is associated with increased odds of being a current smoker.

While resolving these factors is beyond the scope of the health educator or policy-maker, these findings suggest important community segments to be given priority when addressing tobacco smoking.

The findings relating to employment status in the latter survey are not consistent with this proposition, however. Being unemployed can be very stressful due to the pressure this can put on income, self-esteem and key relationships. This is even more stressful if the individual believes they have no chance of obtaining another job because they are uncompetitive. In the earlier survey, the odds of an unemployed person being a current smoker rather than never having smoked were 1.5 times those of an employed person, and this is consistent with the proposition, but in the latter survey, there is no significant difference between the groups, suggesting that unemployment-induced stress might not be a factor in being a current smoker. The improvement might be at least partially explained by the strong rise in the odds of successfully quitting and becoming an ex-smoker among this group. In the first survey, there was no significant difference in the odds ratios for employed and unemployed. In the latter survey, the unemployed were twice as likely to be an ex-smoker rather than never having smoked compared with an employed person. The heterogeneous nature of the unemployed group is discussed in *Limitations* below. Further research is indicated to explore differences within the group and to understand what other influences might be involved.

An apparent paradox emerges from this research: the links between income quintile and disadvantage (IRSD category) and smoking prevalence are particularly challenging as smoking in Australia is very expensive. This research suggests that the likelihood of being a current smoker is highest among those who can least afford it. This may be an indication of just how powerfully addictive nicotine is, but further research is indicated to understand how this could be and to guide development of tobacco-control initiatives that might be more effective with this segment in the population.

Further research is indicated to confirm the role of tobacco smoking in stress reduction and to foster closer cooperation between those active in tobacco control and those seeking to assist people to deal with distress in increasingly stressful times, to ensure alignment of their strategies.

Further research is also indicated to understand why females continue to be far less likely than males to commence smoking, despite the fact that most of the antismoking initiatives (price signals, restrictions on sale and consumption of nicotine, communication campaigns) are gender-neutral. Further research is also indicated to understand why, having commenced smoking, males are more likely than females to successfully quit the habit.

Limitations

The data on which this paper is based were collected by an organisation with a long, well-established history of successfully conducting reliable, valid, large-scale surveys. However,

the findings are based on two cross-sectional surveys conducted 17 years apart. It is not possible to draw any conclusions about the actual trajectories of the changes in the values reported or any correlations between those trajectories. Nor is it possible to make any meaningful forecasts about likely future trends in smoking status in these various segments based on these data sets. That would require a longitudinal study, which is beyond the scope of this project.

The classification structures used in the surveys generates some heterogeneous groups that obscure important differences. For example, it is possible that there are important differences in smoking status between the long-term and recently unemployed, between those unemployed from different occupation, income and IRSD backgrounds. Some factors such as the gender of the unemployed person can be isolated from these data, but it is beyond the scope of this analysis to do so.

Furthermore, the data are all self-reported although the Kessler 10 scores are based on a validated survey instrument. There is no validation of the self-reported smoking status, using such techniques such as cotinine testing. This might lead to under-reporting, especially in a community where tobacco smoking is no longer a majority or even a popular habit. Such clinical testing is also beyond the scope of this project.

Finally, because the surveys are so large, virtually, all the findings are statistically significant. However, the large and growing preponderance of never-smokers in many categories might mean that, if this trend continues, never-smokers could come to dominate the data, making it harder to draw meaningful conclusions about patterns among the equally important current- and ex-smoker groups.

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Appendix

Table A1. Weighted estimates of the population ≥18 and percentage distributions of their characteristics: Australia 2001 and 2017–18

	2001	2017–18
Population ≥18 (in millions)	14.2 m	18.7 m
Age	*%*	*%*
18–24	12.6	12.0
25–34	19.8	19.4
35–44	20.6	17.3
45–54	18.5	16.8
55–64	12.7	15.1
65+	15.9	19.4
Median age for adults	33.6	45.8
Sex ratio (males per 100 females)	95.9	96.1
Highest qualification		
Bachelor's degree or higher	15.6	29.2
Certificate/diploma	33.9	31.5
No post-school education	47.9	35.8
Not known	2.6	3.5
Employment status		
Employed	62.6	65.5
Unemployed	3.7	2.9
Not in the labour force	33.7	31.6
Occupation group		
Administrator/professional	25.5	24.9
Other white collar	18.5	21.6
Blue collar	18.6	18.8
No response/not in the labour force	37.4	34.7
K-10 distress category		
Low distress	64.3	60.8
Medium distress	23.0	21.9
High distress	9.0	8.9
Very high distress	3.6	4.0
Not stated	0.1	4.4

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Food and nutrition education in Australian primary schools: parents' views

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Abstract

Purpose – Primary schools provide continuous, intensive contact with large numbers of children starting from a young age, thus providing an appropriate setting for the promotion of healthy eating through food and nutrition education (FNE). This qualitative study explores the views of Australian primary school parents about FNE in primary schools.

Design/methodology/approach – In total, 19 parents of primary school children from Victoria participated in semi-structured interviews. Audio recordings were transcribed and underwent thematic analysis using Nvivo. A total of three themes emerged: FNE topics currently taught in primary schools, essential food skills and knowledge for primary school children and the importance of FNE.

Findings – Most parents thought that FNE is as important as the core subjects of primary school. Parental support for FNE, which is delivered over a prolonged period, and expanded by hands-on content such as cooking and gardening classes was evident. Parents viewed these classes as likely to improve children's food-related knowledge and healthy eating behaviours. Parents expressed appreciation for schools' emphasis on food sustainability and its alignment with school policies and practices. Parents were keen to see more sustainability included in the curriculum.

Practical implications – These results may have implications for curriculum developers and schools, as the findings can assist the design of food and nutrition curricula for primary schools which can empower children as well as their families to make better food-related decisions.

Originality/value – Australian parents' views of FNE in primary schools have been under examined.

Keywords Parents, Food and nutrition education, Qualitative methods, School health promotion, Curriculum

Paper type Research paper

Introduction

Most Australian children do not meet daily recommendations for fruit and vegetable consumption, and around 40% of their daily energy comes from discretionary food (Australian Bureau of Statistics, 2018). In addition, one in four Australian children is either overweight or obese (Australian Bureau of Statistics, 2018), and unhealthy eating habits are known to be major contributing factors to these conditions (Australian Institute of Health and Welfare, 2011; Australian Institute of Health and Welfare, 2017). Moreover, these habits are likely to continue into adulthood (Singh *et al.*, 2008; Nicklaus and Remy, 2013), increasing the risk of cardiovascular disease and Type 2 diabetes (Daniels *et al.*, 2005; Kelsey *et al.*, 2014; World Health Organisation, 2020). A poor diet can also cause psychological and social problems (O'Neil *et al.*, 2014; Pont *et al.*, 2017) as well as potentially decrease academic performance in children (Suhrcke and de Paz Nieves, 2011; Burrows *et al.*, 2017).

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Schools provide an ideal setting for the promotion of healthy eating through food and nutrition education (FNE) (Bucher Della Torre *et al.*, 2010; Story *et al.*, 2009; Hawkes *et al.*, 2015). The primary school setting provides continuous, intensive contact (Melo *et al.*, 2013) and has the potential to reach large numbers of children, ensuring equity among a variety of socioeconomic status (SES) levels (Lloyd *et al.*, 2011). In addition, most primary school children consume at least one meal and one snack at school each day, which provides an additional opportunity to deliver FNE (Morgan *et al.*, 2010). FNE has the potential to provide students with adequate knowledge and skills to make informed decisions that positively impact their current and future health (Gussow and Contento, 1984; Lichtenstein and Ludwig, 2010; Worsley, 2008; Silveira *et al.*, 2013).

Whilst Australia has a national curriculum, most states also have their own state curricula, which are based on the national K-12 curriculum (Australian Curriculum Assessment and Reporting Authority, 2019). In Victoria, independent (private) schools ($n = 219$) can use either the Australian curriculum or the Victorian curriculum, which tailors the Australian curriculum to Victorian priorities (Victorian Curriculum and Assessment Authority, 2019a), or another approved curriculum (Independent Schools Victoria, 2019). However, government ($n = 1{,}539$) and Catholic ($n = 496$) schools must use the Victorian curriculum (Victorian Curriculum and Assessment Authority, 2019a). The Victorian primary school curriculum (Foundation to year 6, approximately 5–12 years old) outlines FNE mainly in two learning areas, namely "health and physical education" (13 out of the 66 "health and physical education" curriculum items are relevant to food or nutrition) and "technologies" (13 out of the 52 "technologies" curriculum items are relevant to food or nutrition) (Victorian Curriculum and Assessment Authority, 2019a). Teachers are provided with broad content descriptions, which were often criticised as being vague and ambiguous (Donnelly, 2007) and "elaborations" (suggested lesson design ideas) (Victorian Curriculum and Assessment Authority, 2019a). Teachers are encouraged to teach various FNE-related topics such as healthy eating, food production, meal preparation and gardening through elaborations. They also have access to some resources (https://fuse.education.vic.gov.au/) to plan their lessons. However, Victorian teachers predominantly use resources suggested by colleagues and lead teachers, generally found by Internet searches and professional development programs (Love *et al.*, 2020). As teachers have the autonomy to design their own lessons (de Vlieger *et al.*, 2019; Bouterakos *et al.*, 2020), and the frequency of their use of specific resources is unknown, the extent of inclusion of FNE- related topics is unclear.

Over the past decades, there have been many calls to change the approach to FNE and its content in schools (Lichtenstein and Ludwig, 2010; Pérez-Rodrigo and Aranceta, 2001). The evolution of the concept of food literacy (As described by Vidgen and Gallegos (2014) "food literacy is composed of a collection of inter-related knowledge, skills and behaviours required to plan, manage, select, prepare and eat food to meet needs and determine intake.") (Block *et al.*, 2011; Vidgen and Gallegos, 2011) in the past ten years has also contributed to broadening of the perspectives in FNE. Moreover, consumers have rapidly lost touch with the world of food production (Jaffe and Gertler, 2006; Pendergast and Dewhurst, 2012). In addition, there have been considerable changes in the current food environment in terms of supply, distribution and consumption of food (Winson, 2014) as well as significant public confusion with respect to dietary recommendations (Spiteri Cornish and Moraes, 2015). It is suggested that to empower children to adapt to these evolving food environments, FNE must focus on behaviours and aim to improve children's food literacy and skills rather than just providing knowledge alone (Contento, 2015; Hawkes *et al.*, 2015).

Parents' views about school-based healthy eating programs are likely to be vital for development and implementation success (Worsley, 2008) as they play a key role in the formation of children's eating habits (Birch *et al.*, 2007; Shloim *et al.*, 2015). Many primary school children mainly rely on the food choices made by their parents (Birch and Fisher, 1998;

Scaglioni *et al.*, 2008). In addition, the involvement of parents in reinforcing FNE has been shown to be essential for its effectiveness (Lytle, 1995; Pérez-Rodrigo and Aranceta, 2001; FAO, 2020). However, despite their central role in their children's health, parents' views of FNE have rarely been examined.

This study explores Victorian parents' views of the current primary FNE curriculum, the opportunities to improve the FNE curriculum and the availability of support from parents for reform. This study to the best of our knowledge is among only a few to explore parents' perspectives specifically of the ideal content and implementation of FNE within the Australian primary school context.

Methods

A qualitative research design was adopted to obtain a comprehensive understanding of parents' views about FNE in Victorian primary schools (Harris *et al.*, 2009; Swift and Tischler, 2010). This study adopted social constructivism as its theoretical paradigm. Specifically, the questions presented to participants were general and broad so that they could construct the meaning of a circumstance without any influence from the researcher (Creswell, 2007). Qualitative descriptive research methodology (Sandelowski, 2000) is the method of choice to elicit clear descriptions of participants' views of FNE. The descriptions provided by participants in qualitative descriptive studies facilitate the presentation of the facts of the phenomena in daily language (Sandelowski, 2010).

Ethics approval was granted by the Deakin University Health Human Ethics Advisory Group (Project No HEAG-H 24_2018).

Participants and recruitment

Parents from all primary school types (government, independent and Catholic) were purposefully (Patton, 2002) recruited from the suburbs of Melbourne and regional areas of Victoria. Recruitment was advertised on Facebook and notices placed on community notice boards at libraries and supermarkets.

Before each interview, all parents were provided with the plain language statement and consent form. Written consent and permission to audio-record each interview was obtained. Parents were each offered a $20 shopping voucher as compensation for their time. There were no prior relationships between the researcher and the participants. In total, 19 parents (mothers = 18, father = 1) of children attending a Victorian primary school were interviewed from January 2020 to May 2020. Similar to other qualitative enquiries (Patton, 2002), the sample size was determined by data saturation, which occurs when thematic information is no longer enhanced by adding participants (Guest *et al.*, 2006). In this respect, recruitment stopped at the nineteenth interview.

Interview procedure

Semi-structured qualitative interviews were conducted to obtain a detailed understanding of Australian parents' views of primary school FNE. The lead researcher (GA) conducted individual interviews either face-to-face ($n = 13$) or via phone ($n = 6$). Face-to-face interviews were held in public places such as libraries or the participants' own homes. Interview duration ranged from 22 to 54 min, with an average of 37 min.

This paper presents the analysis of responses to a broad question and two follow-up questions: "What food skills and knowledge do you think are essential for your child?", (1) "Which of these do you think should be included in primary school food education?", and (2) "How should these be taught?"

The interview questions were original and based on a review of the literature. An assessment of the face validity of interview questions was made through two pre-test interviews. Since only slight phrasing changes were made in the questions after the pre-testing, the pre-tested data were combined with information gathered from the later interviews.

The interviews were audio-recorded. A professional service (Rev.com) transcribed the interviews verbatim. The lead author re-checked all transcripts for accuracy. Parents were offered the opportunity to review their interviews. However, no participants opted to do this. The lead author read the transcripts several times to gain familiarity with the data.

Data analysis

The qualitative data analysis software package NVivo (SR International Pty Ltd Version 12, 2015) was used for data coding. Data analysis, using the template analysis method (King, 2004), commenced after transcription of the first two interviews. An initial template consisting of *a priori* codes was created based on the research questions and used to accelerate the initial phase of interview coding (King, 2004). Modifications were made to the *a priori* codes, and new codes were inserted to the initial template during the remaining data coding process. In order to achieve an unbiased interpretation of the findings, the lead author discussed the results of the analysis with another qualitative researcher unrelated to the current study (peer-debriefing) (Spall, 1998). The final template comprising the themes was reviewed by all authors of this paper and is described in the results section below.

Results

Parents (mothers = 18, father = 1) across all primary school types (government = 11, independent = 5 and Catholic = 3) from the suburbs of Melbourne ($n = 17$) and regional areas of Victoria ($n = 2$) were included. Although most parents had different ethnic backgrounds (six from Australian and 13 from various other ethnic backgrounds), all had lived in Australia for more than six years. All parents worked at least part-time and had post-secondary education (PhD $n = 2$, master $n = 5$, bachelor = 8, diploma $n = 4$). They all had at least one child (aged 5–12 years old) attending a Victorian primary school.

Parents' views regarding food skills and knowledge are presented under three main themes: FNE topics currently taught in primary schools, essential food skills and knowledge and the importance of FNE. These themes are described below in detail.

FNE topics currently taught in primary schools

Parents identified various FNE topics currently taught at primary school. The majority reported that their children had been studying topics on the environmental impacts of food and sustainability. They also noted that classroom teaching was supported by other school practices, such as recycling and composting at school, and school policies (such as "nude food policy" which encourages children to bring package-free lunches). For example, a parent commented:

> They had a whole year of environmental studies with the food production. That one is pretty good the way it is, I think. My daughter is like, "Oh. Why did you buy that? That's in the package. That's not from Australia. Why is this? Why is that?" She asks all those questions, so I've been very happy with the school from that point of view. (Participant 19)

A total of eight parents stated that their children learned about the importance of eating fruit and vegetables, primarily through the fruit and vegetable breaks at their school. They mentioned that for these ten-min breaks, their children were expected to bring fruit or

vegetables to eat. Some parents noted that there might be some discussions on the importance of fruits and vegetables during these breaks.

> We have to have a crunchy fruit time or crunchy vegetable time, that every day some fruit and some vegetable has to be eaten. (Participant 18)

> They have a fruit break at school at 10 o'clock every day, so they're told to only eat fruit at that time, and how important that fruit is. (Participant 8)

A total of five parents mentioned that their schools had a kitchen garden program, four of which were associated with the Stephanie Alexander Kitchen Garden Foundation (SAKGF; an independent program offered in some Australian primary and secondary schools). Only one parent (from an independent school) mentioned that their school had its own kitchen garden program. They all stated that kitchen garden programs included cooking and gardening components.

> They learned to cook with the vegetables they grow. My son brings some seeds home, like zucchini or peas. We continue to grow at home. He is no more scared of using a knife; he wants to help at home. He sometimes learns new dishes that I have not known and wants us to try at home. He teaches me, and it is enjoyable. (Participant 1)

A few parents whose schools did not have a kitchen garden program stated that their children had cooking classes occasionally (e.g. once or twice a year).

> It's only been when a teacher has chosen for their class that they want to teach them something about cooking. It's been on rare occasions and not often enough. (Participant 19)

> My kids do not really do a lot of cooking in their primary school unfortunately. They might make pancakes on pancake Tuesday because they go to a Catholic school. (Participant 11)

A total of three parents reported the use of the food pyramid as a school FNE resource.

> In the younger years, they did a food pyramid. They used to cut out things from the magazine and put it on the pyramid and say which are the sometimes foods and which are healthy foods, and how much to have of each, and only have a little from the top of the pyramid. (Participant 18)

In addition, a common view was that the extent of the FNE in primary schools was inadequate or not noticeable. For example, two parents reported:

> They've done little bits, but it has not been part of the school program. (Participant 19)

> I do not know what they teach at school, to be honest, I do not think he's been taught anything. . . . I wonder whether they talk about meat, or whether they talk about, dairy. (Participant 5)

Essential food skills and knowledge in primary schools

Parents reported their views of essential food skills and knowledge for their children and which of these should be included in the primary school curriculum. Parents expressed interest in a variety of FNE topics: some already available in their schools (see previous section) and some not.

All 19 parents demonstrated their desire to see some regular cooking programs in the primary school curriculum. However, they expressed various opinions on the programs' extent and the best grade to start. Some suggested it should begin from prep (the first year of school), whereas others thought it would be safer to conduct cooking classes in the senior years of primary schools. Two statements (among many) exemplify these views:

> Parents here would go, "Oh no, that's too dangerous, do not do that." I think that's really important to be independent. If you know how to cook, then you are more likely to eat healthier food. So, I think it's

> really, really important as a survival skill. You can know math, and English, whatever, but then if you die young and what use did it give you? (Participant 4)

> I think cooking is an amazing way of getting kids to eat better because you have to cook the food in a class and do it with other kids. It's fun for them. It's easier to teach kids to cook in their level, I think. (Participant 19)

Gardening was mentioned by 15 parents and was regarded as an opportunity to teach where food comes from and expose children to new food in an enjoyable way, especially for fussy eaters.

> The students may get to learn about gardening. That would be good, especially when we do not have a garden in our houses, so if they can watch plants growing and see how some plants are growing, that would be great. (Participant 12)

> Obviously, if the kids actually plant the food and then see it grown, and then they get to eat it, it might encourage my son a bit. (Participant 6)

Sustainability was the third most cited topic that parents felt should be taught in primary school. Most parents thought that children should be informed about the environmental impact of their food choices.

> Locally produced food I think is better for the environment, and also the fact that if you know where it's grown, and where it's produced, then I guess they've just more conscious that you do not go to the supermarket and just get your food, and that it impacts on the environment, on the economy. (Participant 5)

Teaching about healthy eating was another commonly cited topic that parents felt should be covered. However, some parents expressed concerns about controversial information or beliefs about healthy eating. They pointed out that the information regarding a healthy diet was not clear, and some facts were still debatable. Therefore, they argued that schools should restrict topics where there is not a global consensus on healthy eating and that the information given should not be too complicated.

> I think the knowledge of the benefit of what is healthy food, having the basics. But, I think it's not clear yet, what is healthy, and unhealthy. (Participant 3)

> It should be globally accepted facts, like too much sugar causes cancer... (Participant 1)

Reading food labels was another popular topic amongst parents ($n = 9$).

> The kids would be able to read the labels on the packets, so for example, if you go shopping and they want snacks, they go, "Can I buy a snack that has four stars or above?," that makes it really easy. (Participant 17)

> For example, organic. So, they are able to understand the difference. Later, when they have a little bit more understanding of basic science that is behind, also explaining the labels. What are those emulsifiers or additional chemicals that are keeping food fresh? (Participant 8)

A total of eight parents reported that it was essential to teach the origins of food – "where food comes from" in primary school. It was usually associated with gardening, but they also thought that the topic should be included in classroom teaching.

> As we eat more processed food, it's good to know where it actually does come from. Like even when I say to my children, "kids that chocolate does grow on trees, you know it comes in a bean"... And not everybody maybe has the time, or the knowledge if their kids do ask questions. (Participant 14)

Some parents thought that using the food pyramid as an eating guide would be a good idea.

> I'm just trying to think of the Australian food pyramid. They've recently updated it in the last few years. I think that's a good start to go from. (Participant 2)

On the other hand, some parents expressed negative opinions on teaching the "food pyramid". Some interviewees argued that the food pyramid is too complicated.

> I do not think they need to learn food pyramids and things like that. It's just too complicated. (Participant 17)

> When we saw the food pyramid, and there was always meat there, I often have a bit of a mistrust because I think the dairy or the meat industry has a lot of say into what these guidelines are. (Participant 5)

Even though parents were prompted at certain points during the interviews (when they could not think of any more topics), some topics were discussed less frequently or not considered important, such as food advertising, food hygiene, serving sizes and nutrients in foods.

The importance of FNE

All parents thought that FNE was equally as important as the core subjects of maths and English except for two parents who argued that children can learn about food at home.

> Probably equal, I would say, because it's about health, about their body, so they cannot do their math if they're not healthy. (Participant 18)

> I think it's just as important as learning how to read and write. I feel like we forget how important it is (Participant 10)

> It's sort of in a different category. Math and English is all a basis for education that you need to get a job in the future; however, nutrition is building your own body and living well, which is more important than what job you're going to have in one way. (Participant 19)

Parents believed that FNE was vital to gain life skills and knowledge, which may help to improve general physical health, mood and behaviours as well as academic success.

> They need food and fuel, and we do not want any medical issues, but I do not want children to be overweight because they do not know about food and balance. (Participant 9)

> Being able to go to the supermarket and choose healthy options and budgeting enough to be able to afford those healthy options. Or understanding that if you buy something, just because it's got a green packaging and says it's healthy, does not necessarily mean it is. (Participant 10)

> When the food choices are like bad choices. . . impacts the students' behaviours and learning at the end of the day. (Participant 16)

> I think it's equally as important. Because I think food has a lot to do with our health, but your mental health, gut health and how it affects your mood. (Participant 5)

Some parents also emphasised that FNE should start at a very early age and should be regularly taught across all the years of primary school. Moreover, the involvement of parents, as well as teachers, was regarded as essential to increase its effectiveness.

> They can make it part of their education, but it has to be an ongoing thing, not a one-off. Getting the parents involved, getting the teachers involved would be good. (Participant 17)

> I guess earlier they get taught that, the better, and reinforced throughout the years. I know most of the stuff you learn in primary school becomes something that you do use, compared to high school. (Participant 17)

Some parents mentioned that it is even more important to educate parents as they are the primary food providers, and many expressed their willingness to attend workshops on food and healthy eating if schools provide an opportunity.

> I guess it's more important to educate parents about health. I guess it would be good to have a program that teaches parents and involving both parents and children and really emphasising the importance of healthy eating. (Participant 4)

> There was one for sexual education and another one for cybersecurity. Why do not they have one on food which can be interactive? We can share our experiences and join with our children. (Participant 1)

Discussion

These findings indicate that parents believe the inclusion of FNE topics in primary school education programs is currently limited and more is required. Parents also consider FNE to be as essential as the core subjects of primary school. They recognised FNE as vital for the improvement of general physical health, mood and behaviours as well as children's academic success. There is significant parental support for more FNE content in the current curriculum. These findings are in accordance with recent Australian studies. Teachers in two Australian states – New South Wales and Victoria – reported they did not include nutrition education much in their classroom teaching due to lack of time and absence of sufficient materials (de Vlieger *et al.*, 2019; Love *et al.*, 2020; Bouterakos *et al.*, 2020). Also, parents in New South Wales reported that nutrition education in primary school was very inadequate and should be expanded (de Vlieger *et al.*, 2020).

Moreover, parents acknowledged that FNE topics should be taught for a prolonged period to influence eating behaviours of children. The parents' perception of the need for a scaffolded and sequenced FNE to empower children with knowledge and skills was evident. These results reflect those of parents in the United States, where Patino-Fernandez *et al.* (2013) reported that parents believed that FNE should be embedded in the curriculum and taught across the different grades in primary schools.

Whilst almost all parents were keen to see cooking and gardening classes in the curriculum, they generally reported that cooking classes currently occur only on rare occasions, and the use of gardens was predominantly restricted to only a small group of students (e.g. ones who choose to join the gardening club). Parents believed that their children were more likely to try new foods and gain life skills through these cooking and gardening classes. Parents reported these classes to be fun while teaching many aspects of food and leading to the transfer of knowledge from school to home. This aligns with previous Australian research which suggests that Australian parents would like to see more experiential learning regarding FNE (Booth *et al.*, 2009) and demonstrates support for school kitchen garden programs (Block *et al.*, 2012). These findings are also consistent with evidence from other countries such as South Korea, Hong Kong and the United States, where parents have reported that FNE should be easy to apply in practice and should include cooking and gardening classes that children enjoy (Kim *et al.*, 2019; Knapp *et al.*, 2018; Lai-Yeung, 2015). The transfer of knowledge through these lessons has also been reported by previous studies which describe children as "the agents of change" in improving cooking practices at home and incorporating new dishes and food (Drummond, 2010; Ensaff *et al.*, 2015).

The current study has highlighted parental support of the emphasis on food sustainability-related topics that are complemented with policies and practices within the school setting. This might be an outcome of the inclusion of sustainability as one of the three cross-curriculum priorities in both the Australian curriculum in 2010 (Australian Curriculum Assessment and Reporting Authority, 2010) and the Victorian curriculum in 2015 (first

implemented in 2017) (Victorian Curriculum and Assessment Authority, 2019b). However, this finding is contrary to that of Nichols and Thorne (Nicholls and Thorne, 2018), who demonstrated that Queensland teachers did not include sustainability in their classroom teaching. Also, Australian primary schools' implementation of sustainability education policies has been criticised as being tokenistic (Morley, 2020). These inconsistencies may be due to the core values of the schools, differences between states or the impact of personally invested teachers/staff who are passionate about the topic at these schools.

Parents also expressed their support for teaching about healthy eating in the classroom. They reported that their children were currently taught about the importance of eating fruits and vegetables, especially on the fruit breaks at school. However, our enquiry also revealed some parents' confusion and mistrust in nutrition information, and some expressed a lack of acceptance of the food pyramid to teach healthy eating. This echoes the findings of O'Key and Hugh-Jones (2010), who reported mistrust among British mothers who found health information inconsistent or overly influenced by food industry stakeholders. Similarly, mistrust in nutrition information and food pyramid were reported by previous Scandinavian studies among the general adult population (Kristensen *et al.*, 2013; Bergman *et al.*, 2019).

Our study also confirmed the existence of parental information-seeking behaviour. As Bathgate and Begley (2011) reported, parents want to see more resources aimed at children and want access to further information on nutrition, additives and food safety. Specifically, in our study, parents reported that receiving information themselves was at least as important, if not more important, than the children receiving information. Second, almost all parents expressed their willingness to join a workshop on food and healthy eating. However, in contrast with reported intentions to attend such programs, low parental attendance has been widely reported due to scheduling and transportation barriers (Duppong-Hurley *et al.*, 2016). Therefore, providing information to parents through school newsletters may be an efficient alternative option. Also, online education delivery methods should be considered to improve parental attendance (Sanders *et al.*, 2012).

Our findings highlight the parental support for the expansion of the current primary school curriculum through the inclusion of more FNE-related topics, especially with practical activities such as cooking and gardening. However, the substantial barriers to teaching FNE-related topics that Australian teachers face such as an absence of time and teaching materials (Drummond, 2010; Love *et al.*, 2020; de Vlieger *et al.*, 2019; Bouterakos *et al.*, 2020) must also be considered. These barriers may be overcome by providing teachers with easy-to-use FNE resources and professional development or human resourcing such as specialised FNE teachers, as in Japan and South Korea (Nakamura, 2008). Increasing governmental financial support for ongoing school kitchen garden programs also may be a feasible option, as parents expressed their satisfaction with these programs. In addition, the confusion, mistrust and concern that parents expressed about some FNE-related topics or resources might be addressed by organising workshops or other information resources for parents.

Some limitations of this study need to be considered. For example, the study might have attracted people with more interest in food and nutrition, which may have led to a selection bias. The sample, therefore, is unlikely to be representative of the whole population of Victorian primary school parents. This is a limitation of most qualitative studies where the aim is to identify novel themes rather than to estimate their prevalence. The present results could, however, be used to inform a future nationwide survey to explore views of a broader range of parents, particularly in developing a curriculum-based FNE program tailored to contemporary needs of society members. Moreover, Australian primary school teachers' views about the inclusion of FNE-related topics into the taught curriculum, such as those suggested by parents, should be investigated in depth to evaluate the feasibility of this reform from a teacher and school perspective. Finally, while it was concluded that children usually receive quite limited FNE in primary schools, this information is based on parents' recall and

their understanding of what they regard as FNE and may not be reflective of what was actually being taught.

Conclusion

This study provides unique insights into the opinions of Victorian parents towards the FNE- related content in the primary school curriculum. Parents expressed concern over inadequacy of the FNE-related content and the need for more, thus justifying the need for expansion of the current curriculum to improve food and nutrition knowledge of children and their health behaviours. The importance of starting at early ages and delivering over a prolonged period was also emphasised. The findings also suggest that many Australian parents support the inclusion of hands-on content such as cooking and gardening classes and as well as the expansion of food sustainability topic to empower children against contemporary problems. Moreover, responses revealed that workshops for parents on food and healthy eating might be helpful to assist and empower them with their food choices and may address parents' confusion, concerns and mistrust on food information.

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