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Evaluating the health promoting schools in Iran: across-sectional study

Mehrangiz Sartipizadeh
Department of Family and Schools Health, Deputy of Health, Iran University of Medical Sciences, Tehran, Iran
Vahid Yazdi-Feyzabadi
Health Services Management Research Center, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, Iran
Minoo Alipouri Sakha
Social Determinants of Health Research Center, Ardabil University of Medical Sciences, Ardabil, Iran and Department of Health Education and Promotion, Deputy of Health, Iran University of Medical Sciences, Tehran, Iran
Aein Zarrin
School of Public Health and Health Systems, University of Waterloo, Waterloo, Canada
Mohammad Bazyar
Department of Public Health, Faculty of Health, Ilam University of Medical Sciences, Ilam, Iran
Telma Zahirian Moghadam
Social Determinants of Health Research Center, Ardabil University of Medical Sciences, Ardabil, Iran, and
Hamed Zandian
Social Determinants of Health Research Center, Ardabil University of Medical Sciences, Ardabil, Iran and Department of Community Medicine and Family, Ardabil University of Medical Sciences, Ardabil, Iran

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Abstract

Purpose – Health-promoting schools have been associated with improvements in the health status of students globally. This study is a secondary analysis study assessing Iranian HPSs.

Design/methodology/approach – This was a cross-sectional study on routinely collected data using an external audit 63-item checklist, which was utilized to evaluate 440 HPSs between 2014 and 2017. The mean score for each of the checklists' components was calculated. Nonparametric tests were conducted to investigate the association between the presence of a school caregiver, students' educational level and the school's score.

Findings – While the number of five- and four-star schools increased significantly, one- to three-star schools declined. Providing clinical and counseling services had negative growth. Despite the steady growth of the staff's health, this category still had the lowest score among; on the contrary, physical activity had the highest score in 2017. The presence of a full-time school caregiver and middle schools were both significantly correlated with achieving higher scores ($p < 0.005$).

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Originality/value – It seems that in addition to developing school facilities to promote physical activities, measures should be taken to promote access to counseling services, considering health issues of students and staff and finally increasing the number of full-time school caregiver

Keywords Evaluation, Health promoting schools, Iran

Paper type Research paper

Introduction

Childhood and adolescence are essential periods to adopt health-promoting behaviors (van Dongen *et al.*, 2019). Examples of such healthy behaviors are lower alcohol consumption and substance use, higher physical activity and better nutrition, which are all associated with improved well-being, lower mortality due to chronic conditions and delayed onset of many life-threatening chronic/acute illnesses (Akel *et al.*, 2019).

The school setting could influence students' health by increasing their health knowledge and adoption of healthy behaviors (Catalano *et al.*, 2004; Bartelink *et al.*, 2019). A range of international initiatives such as health promoting schools, child friendly schools, comprehensive school health and the FRESH initiative has been introduced globally in the last years (Promotion and Education, 2009). European Network of Health Promoting Schools (ENHPSs) formed in 1980 with members from 43 countries. Australian school health association began to work from 1994 (Dadaiyn *et al.*, 2016). All of these approaches have similar underlying concepts, based on the Ottawa Charter (1986) (Veugelers and Schwartz, 2010), which integrated ideas about health promotion from Canada and WHOs European office. (Vince Whitnam and Aldinger, 2009).

In 1995, the World Health Organization (WHO) HPS, a whole-school approach, aiming to enhance students' and staff's health (Liu *et al.*, 2019) by facilitating health-focused educational environments (Lee *et al.*, 2003; World Health Organization, 1995; Lee *et al.*, 2007). HPS approach indicates a shift from traditional classroom teachings to a more integrated approach that focuses on students', teachers' and parents' attitudes, behaviors and the overall school environment (Deschesnes *et al.*, 2003). This concept has focused on organisational and structural changes, including improving the physical and social environment of the school and its curricula (Lee *et al.*, 2019). Based on WHO's guideline, HPS could integrate health promotion within their policies, physical environments, social environments, group activities, personal health skills and schools' health services (Aldinger *et al.*, 2008). Therefore, adequate implementation of such guidelines requires restructuring the physical and social characteristics of schools (Shahraki-Sanavi *et al.*, 2018).

Approaches to health-promoting school concept varied based on educational and cultural contexts. Various political, social and economic aspects influence setting priorities, aims and components of HPS (Bruun Jensen *et al.*, 2002). HPS has been established widely across many countries, including China, Hong-Kong, England, Canada and countries in EMRO (Lee *et al.*, 2003; Lee *et al.*, 2007; Gleddie, 2011; Pearson *et al.*, 2015; WHO/EMRO, 2006). HPS approach is characterised under six components, including the formal curriculum, school ethos, physical environment, policies and practices of the school, school health services and the school-home-community interaction (Booth and Samdal, 1997).

Taking the "settings approach" developed by the WHO in the 1980s, the ENHPS considered these aspects in developing a health-promoting school: the taught curriculum, the school ethos, the values and norms of the school, relationships, management structures, the physical environment, staff health and well-being, student health and well-being, teachers' educational competencies and cooperation with the community (Gray *et al.*, 2006). Components of the national framework for HPS in Australia were curriculum, teaching and learning practices; school organisation, ethos and environment and partnerships and services (Association, Australian Health Promoting Schools, 2001). Another comprehensive approach to school health

promotion is the Comprehensive School Health Program concept, which is used more frequently is the US and Canada. This program consists of eight components: (1) planned, sequential health education across the whole curriculum, (2) school-based health services, (3) school environment, (4) physical education, (5) food services, (6) counseling services, (7) staff health promotion and (8) school/community integration of health promotion efforts. Both the HPS and CSHP approaches rely mainly on a "school-based" approach; however, some of the CSHP literature suggests the implementation of community-based initiatives that apply to the environment beyond the school setting (Deschesnes *et al.*, 2003).

The designs and methods used for assessing HPSs varied across the investigations. Randomized control trials are ideal, but as their underpinning statistical assumptions are not valid to reflect the organisational or structural changes, concluding could be limited (Lee *et al.*, 2019). Other approaches consider stakeholders' concerns and interests and evaluate their capacity to develop, implement and assess HPSs (Pommier *et al.*, 2010). Some studies have undertaken formative, process or outcome evaluation (Stubbs *et al.*, 2014). The English Wessex Healthy School Award Scheme and the Hong Kong Healthy School Awards Scheme adopted the process evaluation approach, to analyze the process of attaining standards for a model HPS (Lee *et al.*, 2019).

Studies that have mainly focused on students' physical activity levels, nutrition, reproductive health, mental health and substance use have (Medeiros *et al.*, 2018) mostly prioritized the development of indices that facilitate formative assessments and the quality measurement of schools' performance (Hoyle *et al.*, 2008). In fact, setting such standards could assist other schools to adopt health promoting schools' principles (Inchley *et al.*, 2006).

In Iran, there is a paucity of information based on the concept of HPSs, their assessment and criteria for their implementations. To our knowledge, the majority of current studies have only focused on a single dimension of health promotion outcomes, such as nutrition (Yazdi-Feyzabadi *et al.*, 2017; 2018), while not much has been done to evaluate the overall performance of HPSs and effective factors explaining their continuity and success in Iran. Thus, the focus of this paper is two-fold; the first objective is to evaluate implementation of HPSs. The first objective contains the main research aim to investigate how their components have fluctuated throughout the past years in Iran. The second objective is to analyze differences in school's score between the presence of a part-time and full-time school caregiver on the one hand and compares school's score with schools educational stage on the other.

Health-promoting schools in Iran

In a regional consultation meeting on HPS in the Eastern Mediterranean Region (EMRO) in 2005, school health experts shared their experiences to identify the best mechanisms for creating networks of HPSs (WHO/EMRO, 2006). As a consequence, HPSs initiative in Iran started by integration of "School Health Management System" and "Schools' Ranking Plan", following an agreement between of the Ministry of Education (MoE) and Ministry of Health and Medical Education (MOHME) in 2010 (Motlagh *et al.*, 2009). After implementing a pilot phase in five Iranian provinces in 2010, it is planned that the number of these schools would be increased nationwide. Iranian health promoting schools (IHPSs) program based on the recommended WHO framework for HPS in the EMRO, focus highly on self-care, health promotion and collaborative initiatives to enhance individual and the population's health (Yazdi-Feyzabadi *et al.*, 2018).

IHPS program mainly was developed in three levels of public schools: primary school, junior high school also known as middle school and senior high school or high school. The strategic committees of HPSs were formed according to the predetermined criteria aiming to implement an organized program on the national, provincial, regional and school level. One of the committee's tasks has been selecting schools and setting an external audit team to

monitor and evaluate the selected schools. At the beginning of the year, a coordination team including the school principal and staff conduct an internal audit based on an internal audit checklist. School caregiver is a member of school health committee. A full-time school caregiver is a certified BS in health, whereas a part-time school caregiver is a trained school staff who completes some health assistant training programs. They advocate for and liaise between schools and district health center. The results will be transferred to the County Committee for an external audit, using a checklist. This "External Audit Checklist" is prepared by the MOHME. A team of health experts from a district health center of the primary health care (PHC) system run external audit by visiting schools, observation and interviewing with students, staff and teachers. This checklist consisted of eight components: 1. comprehensive health education, 2. clinical services, 3. healthy physical environment, 4. nutrition improvement in school, 5. physical activity, 6. promoting staff's health, 7. mental health services and counseling and 8. parents, students and community participation in health promotion programs. After the initial audit, schools are given an opportunity to address the areas of weakness, followed by a final external audit. Eventually, if the school receives a score of minimum 55 out of 100 score, they would be recognized and rated as health promoting schools.

Methods

Study design and participating schools

This study was a cross-sectional study, which analyzed the secondary data collected from 419 schools in 2014, 416 schools in 2015, 411 schools in 2016 and 440 schools in 2017. All schools were located in the West and the North West regions of Tehran supported by the Iran University of Medical Sciences, one of the largest medical universities across Iran, marking a diverse range of geographical and socioeconomical locations of Tehran province.

Measurement

Routinely collected data using an external audit checklist, recommended and prepared by the MOHME was used. This checklist consisted of eight components: (1) comprehensive health education (with eight sub-components), (2) clinical services (with 11 sub-components), (3) healthy physical environment (with 12 sub-components), (4) nutrition improvement in school (with six sub-components), (5) physical activity (with five sub-components), (6) promoting health staff's health (with eight sub-components), (7) mental health services and counseling (with eight sub-components) and (8) parents, students and community participation in health promotion programs (with eight sub-components).

After selecting schools by the Ministry of Education, the provincial / regional committee conducts an external audit using aforementioned checklist. The overall score is out of 95 with an additional five scores for completion of the school's documents, reports and demonstration of problem-solving capacity (Motlagh *et al.*, 2009). The minimum required score to qualify as a HPSis 55, with receiving at least the score of three in school management, six in comprehensive health education, nine in clinical services, 12 in healthy physical environment, six in nutrition improvement, four in physical activity, four in promoting staff's health, six in mental health services and counseling and nine in parents, students and community participation in health promotion programs.

Further, schools were categorized based on their score: Five stars for those that received an overall score of 91–100, four stars for 82–90, three stars for 73–81, two stars for 64–72 two stars and only one star for schools receiving 55–63. This scoring system was conducted annually from 2014 to 2017 (see Table 1).

	Components	Checkpoints	Score
1.	Comprehensive health education	Existence of a board, in which the education topics is specified	1
		HPS medal	1
		Existence of a Coordinator of educational programs	1
		Holding explanation sessions for the students, teachers, parents and staff	2
		Existence of health educational resources and contents for students, teachers, parents and the staff	2
		Distribution of health educational content between students, teachers, staff and parents	2
		Executing the health activities program according to the health occasions calendar	1
		Providing health educations specified for the students, parents, teachers and the staff	2
2.	Providing clinical services	Existence of fully equipped health room	2
		Existence of one school care giver regularly or with a scheduled plan	2
		Following-up and completing the vaccination of the school students	1
		Existence of a health identification card for each student	2
		Conducting the students' screening tests	2
		Identifying the referral required cases	1
		Implementing referral system	1
		Following-up the referral cases	1
		Completing the school health file	2
		Existence of first aids box with full equipment at school	1
		Existence of at least one nurse to carry out the first aids and educating students and the staff	1
3.	Healthy physical environment	School convenient space and location	2
		Convenient space of the classrooms, laboratory, etc.	2
		Access to healthy drinking water	3
		Hygienic lavatories and toilets	1.75
		Hygienic disposal of sewage and garbage	0.75
		Good and appropriate light, heat, sound, humidity and air conditioning in classes	2
		Safe environment in classes	2
		Separating garbage and existence of enough trash cans	0.5
		Observing safety and effective preventive measures against the accidents	3
		Cleanliness of the school environment (the school has a person responsible for cleaning)	2
		Efforts in creating green area at school	1
		Environmental-biological activities	1

(*continued*)

Table 1.
Components, subcomponents and their points in the external audit checklist of health-promoting schools

	Components	Checkpoints	Score
4.	Nutrition improvement in school	Existence and observing the physical space and the equipment of healthy nutrition base	4
		Installing allowed and disallowed foot stuff instructions exposed to the students' sight	2
		Supervising on the way of preserving, distributing and consuming the food stuff at school	1
		Having the health authenticity certificate and work permission of the base person in charge and the food stuff salesperson	2
		Displaying the culture-building programs and teaching the healthy nutrition at school	1
		Supervising on the way of preserving, distributing and consuming of food stuff at school	2
5.	Physical activity	Existing of sport and physical education hour	1
		Existence of incentive training programs for doing extracurricular activities, advantages and disadvantages of inactivity	1
		Performing cultural and educational programs	1
		Providing suitable opportunity for the participation of all students in the morning physical exercise	1
		Providing minimum required facilities for physical activities of the students at school	1
6.	Promoting health of school staff	Existence of a health identification card for each of the teachers and staff	2
		Coordination in order to do the annual screening test of the teachers and staff	1
		Identifying the referral required cases	1
		Following-up the cases referred	1
		Social, recreational and sport facilities for the school teachers and staff	2
		Attending in-service training courses related to health	1
7.	Mental health services and counseling	Existence of full time or part time consultant	2
		Existence of social and recreational programs at school	1
		Teaching life skills to the students at school	1
		Training the parents of the students in the field of child-rearing (parenting) skills	1
		Identifying the students exposed to the risk of social injuries and risky behaviors	2
		Providing special services to the students exposed to the risk of social injuries and risky behaviors and families	1
		Identifying the mental and behavioral disorders in the students and providing services to the students including referral, follow-up and care	2
		Not enforcing physical and mental punishments on students	1

Table 1. (*continued*)

	Components	Checkpoints	Score
8.	Parents, students and community participation in health promotion programs	Following-up the school health issues in the parents and teachers association	2
		Participating in health programs and supporting them financially by parents and teachers association	1
		Implementing health training programs for the parents of students	1
		Trained health aiders (Behdashtyar) in four groups at school	2
		Effective measures to promote activities of peers' health trainers	1
		Activate student health network volunteers	1
		Training peers by health trainers	1
		Active participation of student health network volunteers in school health problems	1

Table 1.

Data analysis

We utilized descriptive statistics to present the distribution of HPSs across various categories. Additionally, the mean score for each of the checklists' eight components was calculated to identify the areas that require further investigation. Nonparametric tests were conducted to investigate the association between the presence of a part- time and full-time school caregiver, school educational level and the school's score. To analyze the association between the school caregiver and the overall score, Kolmogrov–Smirnov test was conducted, which eventually indicated a lack of normality of data; therefore, the Mann Whitney test was utilised to assess this association. Meanwhile, to test the association between school educational level and the overall score, the Kruskal Wallis test was conducted.

Findings

Overall, 440 schools participated between 2014 and 2017. Table 2 summarises the general characteristics of these schools (see Figure 1).

		Frequency							
Variable		Shahriar	Robat Karim	Baharestan	Malard	West	North-West	Ghods	Total
Stages of school	Elementary school	28	32	43	34	66	63	23	289
	Middle school	19	13	15	7	16	28	8	106
	High school	2	5	5	3	10	18	2	45
Total		49	50	63	44	92	109	33	440
School caregiver	Full-time school caregiver	11	8	15	34	74	54	12	208
	Part-time school caregiver	38	42	48	10	18	55	21	232
Total		49	50	63	44	92	109	33	440

Table 2.
Frequency of schools regarding school caregiver type and stages of school-2017

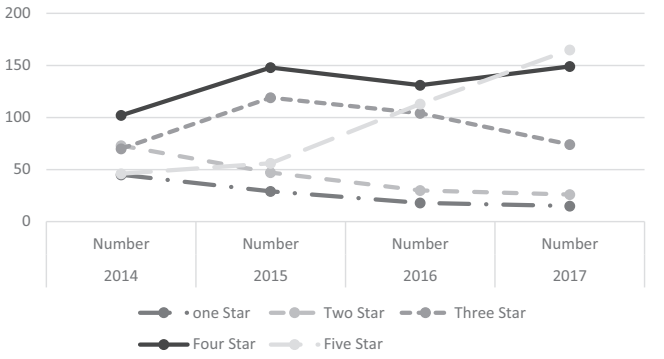


Figure 1.
The trend of school star changes 2014–2017

Out of the 440 schools in 2017, 97.5% ($N = 429$) received at least one star from which 38.44% ($N = 165$) qualified for five stars, marking a 24.77% increase since 2014. Within the same period, the prevalence of one- to three-star schools reduced by 9.90%, 15.67% and 3.58%, respectively.

Figure 2 highlights the overall score of health-promoting schools in 2017. Accordingly, the lowest score corresponded to the staff's health status with an overall mean of 71.59 (±32.05).

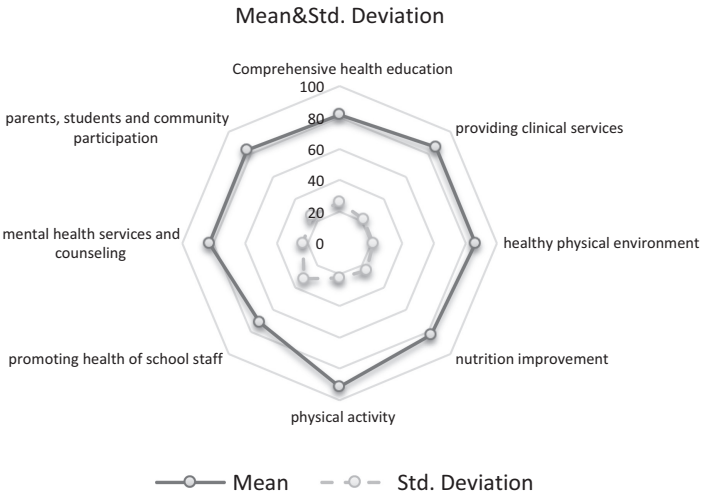
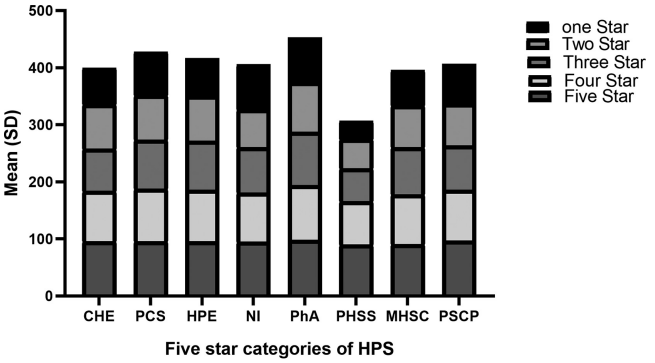


Figure 2.
Mean and std. deviation of components of health promoting schools in 2017

Figure 3 represents the mean of health-promoting schools' performance in each of the five-star categories. Among one-star schools, staff's health had the lowest score of 32.00 (± 34.00), while nutrition scored the highest (79.00 ± 20.00). Similarly, other categories scored the lowest in staff's health. Meanwhile, physical activity had the highest score in two- to five-star health-promoting schools. Following staff's health, mental health and counseling services, a comprehensive health curriculum and the school's environment received low scores, respectively. Among two-star health-promoting schools, in addition to mental health and counseling services, nutrition and parents' engagement in health promotion received low scores. Last, three- and four-star schools scored low in formulating a comprehensive health curriculum and engaging parents in health promotion.



Abbreviations mean as CHE: Comprehensive Health Education, PCS: Providing Clinical Services, HPE: Healthy Physical Environment, NI: nutrition improvement, PhA: Physical Activity, PHSS: Promoting Health of School Staff, MHSC: mental health services and counselling, and PSCP: Parents, Students and Community Participation.

Figure 3.
Mean and standard deviation of different components of Health Promoting Schools (HPSs)

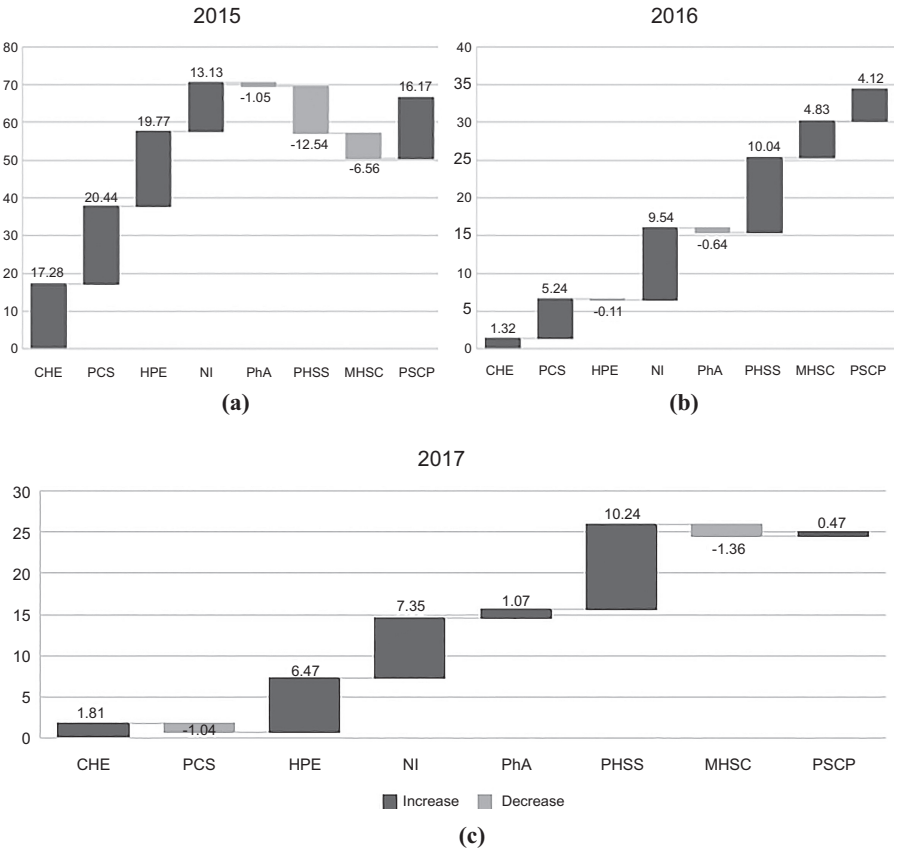
Figure 4 is indicative of the changes in each of the checklist's items from 2014 to 2017. While clinical care-provision, mental health and counseling services and physical activity declined within this period, staff's health grew considerably.

We hypothesized that schools with a full-time school caregiver who is a qualified health worker will score significantly higher than schools with a part-time school caregiver. The Mann–Whitney test results indicated that schools with a full-time school caregiver scored significantly higher than schools with a part-time school caregiver ($p < 0.000$). Due to the lack of normality of the scores, the Kruskal–Wallis test was conducted. This test highlighted that there is a significant difference between the school's score based on the level of education. Paired tests indicated that high school students scored significantly higher than middle school and elementary schools.

Discussion

The research on HPSs has been growing to identify effective methods of improving students' health in recent years (Darlington *et al.*, 2018). To our knowledge, this article is the first investigation that evaluated the implementation of HPSs in Iran quantitatively, based on observation and interview. Through this evaluation, we utilized a standardized checklist to investigate the characteristics of HPS's components and their fluctuations, to determine progress and success in implementing the program in Iran. We also compared the schools' success based on their education level and the presence of a full-time vs part-time school caregiver.

Our findings indicate that while the number of one- and two-star schools have declined in the past four years, higher-level schools (four- and five-stars) have grown rapidly. The findings showed that the school's staff health is one of the key areas that should be taken in to account, as it was scored the lowest consistently. Presence of a school caregiver and implementing the program in high school were both significantly associated with higher scores. Overall, growth in most areas of the checklist indicate the enhancements in establishing these schools. Future research could focus on how these enhancements could affect the health status of Iranian HPS students. Schools' adaptation of HPS principles, with a focus on infra-structural and organizational modifications, is the first step to evaluate HPS (Inchley *et al.*, 2006). Utilising a checklist with six standards and three categories (bronze, silver and gold), Chen *et al.* indicated that such schools were most successful in enhancing students community participation, while skill-based health curriculum was scored the lowest



X-axis shows Relative growth rate (RGR) the average changes in the total scores of eight components of Health Promoting Schools (HPS) in comparing the previous year. Where A) shows RGR of eight component of five-star HPS in 2015 in comparing 2014, B) shows RGR of eight component of five-star HPS in 2016 in comparing 2015, and C) shows RGR of eight component of five-star HPS in 2017 in comparing 2016. Y-axis shows CHE: Comprehensive Health Education, PCS: Providing Clinical Services, HPE: Healthy Physical Environment, NI: nutrition improvement, PhA: Physical Activity, PHSS: Promoting Health of School Staff, MHSC: mental health services and counselling, and PSCP: Parents, Student and Community Participation.

Figure 4.
The average changes in the total scores of eight components 2014–2017

(Chen and Lee, 2016). In India, using a similar checklist, healthy physical environment, awareness of the HPSsProgram, school health services, school nutrition services, sports training, counseling, psychology and social services, community participation and schools' participation in the establishment and adherence of more schools to the program were assessed. Based on this checklist, schools were categorised in one of the four groups of bronze, silver, gold and platinum. In 2011, more than 52.9 and 23.5% of schools were evaluated in the bronze and gold level, respectively. After two years, re-evaluation indicated

that 76.4 and 1.8% of schools were in the gold and in the bronze categories, respectively. Similarly, this study indicated significant growth in the number of schools that qualified as gold (Thakur *et al.*, 2014). In Hong Kong, after the establishment of first health-promoting schools in 1998 and "Healthy School Competitions", similar methods of assessment to our study's checklist were developed. These assessments were based on long-term and short-term frameworks; for instance, health promotion in the school was evaluated based on determinants of a school's success, such as the school's environment and health services, students' capacity for self-care, schools' policies and organisational interventions. Through these assessments, it was evident that mental health issues, unhealthy nutritional habits, sedentary lifestyle, risky behaviors, lack of accessibility to health services and lack of staff's training were the most common issues in Hong Kong (Lee *et al.*, 2005). A 1999 study also evaluated Wessex health-promoting schools in educational curriculum, social communications, healthy food choices, physical activity and health-promoting work conditions. It was indicated that ranking schools and overall competition helped schools enhance in all of the aforementioned domains. (Moon *et al.*, 1999). Nutritional evaluation is another component of this program. A study on unhealthy snacking behavior among Iranian adolescents reported that limited empowerment of the students; poor parental control practices toward the limitation of unhealthy snack intake, and accessibility of unhealthy snacks were the most important facilitators (Yazdi-Feyzabadi *et al.*, 2017).

School staff' awareness of the health-promoting schools' concept and their practices is a crucial issue. A randomised control trial in Australia showed an increased level of awareness of the HPS concept among intervention schools. However, there were no significant changes in health-related practices at the school level, among both intervention and control schools (Mitchell *et al.*, 2000).

School staff are role models for students and all should adhere to the principles of health promotion. Considering the key role of school staff in implementing the health-promoting program, ensuring their health is a priority. Despite holding sessions and providing health educations for the staff, their health was one of the lowest scored categories. A possible explanation is a shortage of indoor social, recreational and sports facilities for the school staff. According to article three and eleven of general health policies and article four of general of general population policies, the Ministry of Health is required to formulate and implement a basic health package for government employees. The aim of this program is to promote occupational health, identify risk factors, manage these risk factors through collaboration with the Ministry of Education and prevent disease progression.

As school settings are different in terms of staff and environment at different stages, we examined if these differences affect school scores and its performance in 8 components. A key finding from the research emphasizes the importance of school caregivers who develop school health programs. There are constraints to the use of health professionals to deliver school health promotion interventions. The distribution of school caregiver is uneven across regions. In some schools, health programmes are delivered by trained part-time counselors so one of the challenges in schools is non-continuous health education due to lack of full-time caregiver. Interaction between the Ministry of Education and the MoHME will be necessary to recruit additional staff to support the implementation of program

It is important to note that practising a healthier lifestyle in such early stages is considered as one of the determinants of consistent healthy behaviors later in life (Moon *et al.*, 1999). Contrary to our findings, Lee *et al.*, highlighted that elementary students are more likely to reduce fast-food consumption and report better health following the implementation of health-promoting school programs (Lee *et al.*, 2006). In addition, HPSs were associated with improved outcomes among elementary students in Taiwan (Chen and Lee, 2016). Meanwhile, some studies are similar results to our study, highlighted female high school students to be

more likely to adopt healthy behaviors and better physical activity behavior following the implementation of the program (WR, 2012; Moon *et al.*, 1999).

It is crucial that HPSs maintain and grow their performance over time. To do so, alongside the current support of the Ministry of Education, strong management and appreciation of the schools' cultural characteristics are essential. Strong localized management is significantly associated with more effective implementation of health-promoting programs and even the overall performance of schools (Darlington *et al.*, 2018). Further, policies that promote such schools were associated with higher average scores. These policies include unifying health-promoting schools' activities and promoting collaboration between local communities to pursue the schools' goals, such as better care-provision to students, first aid courses for students and educators, promoting on-campus tree-planting and regular health monitoring among the staff through collaboration with primary care providers (Babazadeh *et al.*, 2017).

Due to the interdisciplinary nature of health-promoting schools, implementation and subsequent evaluation of these schools are challenging (Chen and Lee, 2016). Yung and colleagues recommended utilizing indices that focus on social networking and policy-making procedures in the community to facilitate a more practical development. However, such evaluation is limited by the lack of causal evidence that highlights the effectiveness of health-promoting programs (Joyce *et al.*, 2017). Therefore, current schools must ensure the provision of comprehensive data on the program's success, growth and effectiveness in addition to the influence of schools on its participants' outlook on health and healthy lifestyle. Moreover, employing quantitative methodologies to assess such data are a key (Veugelers and Schwartz, 2010). Alongside the contextual complications, the length of the program, choosing between top-down vs bottom-up implementations, community support and adopting local cultural values are other challenges in establishing high performing schools (Darlington *et al.*, 2018).

There are some limitations regarding the checklist that was used in this study. The development of the checklist involved the cooperation of the Ministry of Health and the Ministry of Education. In the pilot phase, despite the ongoing assessments and corrections, no investigations were conducted to evaluate the checklist's validity and reliability. On the other hand, as the checklist focused on process indicators to a limited extent, it cannot correctly measure the school's fidelity to process, so more studies on deployment and implementation processes and the degree of their compliance with instructions is recommended. In addition, the relationship between the components of the checklist seem to be minimal, particularly with regards to the selection of material and changes in the syllabi. Committees set up by the Ministry of Education to prepare educational policies. Textbook development teams are the approving authority for the syllabus, and content of schools textbooks are produced at the macro level. Although the need for further observations of the curricular reform is acknowledged, it seems un-affordable. Countries may differ in their approach to perception and understanding of health promotion schools. Based on this approach, the content of HPSs in Iran may be defined in parallel to other school health programs. This has made it more complex to implement integrated interventions in school policy alongside organizational and environmental modifications in the school system. Therefore, the checklist cannot measure these fundamental interventions. Evaluators may bring biases to the observation/evaluation, which can affect the scores. To minimize such biases, clear guidelines in addition to the use of practical checklists and protocols are required.

Conclusion

This article has had a two-fold aim: (1) to evaluate implementation of HPSs and (2) to analyze association between schools' score and the type of school caregiver and schools educational level.

Based on the results, more than a third of schools were five stars marking a steady growth in high-performing schools since 2014. Overall, schools performed well in the areas of physical activity, nutrition and health environment. However, their status was marked as "inappropriate" in the areas of staff's health, mental health and counseling services. It can therefore be argued that in addition to developing school facilities to promote physical activities, measures should be taken to promote schools' mental health, by discussing mental health issues, increasing counseling services accessibility, minimizing unnecessary mental stress and expanding the number of active health workers on-site.

Health-promoting schools' programs could be a cost-effective solution to promote health among students and potentially enhance a community's health and well-being. Overall, this study highlighted strengths and weaknesses of such programs in Iran, informing policy-makers and investigators regarding the future direction. It seems that a long time-frame and more structured support are required to maintain and develop qualitatively health-promoting schools' implementation; therefore, a sustainable strategy and funding to promote and enhance health-promoting schools isone of the most important priorities. The research reported here adds depth to our understanding about the importance of human resources such as health workers regarding their benefits to HPS.

Future research could focus on identifying factors that could facilitate a more successful implementation of health-promoting schools in Iran. Further work to develop indicators for a health-promoting school to measure school-healthy behaviors and revision of the national administrative guideline and the validity and reliability of the audit checklists is also essential.

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Corresponding author
Minoo Alipouri Sakha can be contacted at: Alipourisakha.d@iums.ac.ir

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Will comprehensive sexuality education (CSE) help in youth development?

Hari Hara Sudhan Ramaswamy
RGNIYD, Sriperumbudur, India

Abstract

Purpose – The purpose of this review is to critically analyse the extant research and help readers understand the ways the school-based comprehensive sexuality education (CSE) can contribute towards youth development and urge policymakers to implement nationwide good-quality, scientific, culturally relevant, age-appropriate and holistic school-based CSE.

Design/methodology/approach – This literature review has been designed using the extant information available on Google Scholar, Web of Science (WoS) and PubMed.

Findings – The findings of this review inform that there is a significant need amongst the youth of the day for good-quality, scientific, culturally relevant, age-appropriate and holistic school-based CSE. Also, the findings suggest that there are significant associations between school-based CSE and youth development.

Research limitations/implications – This research paper although draws from extant literature about sexuality education and its delivery across the globe, it applies the sexuality education scenario in India.

Practical implications – The findings of this review aim to implicate nationwide policy-level changes to implement CSE in the school curricula. There are more practical behavioural changes that CSE could foster amongst students, which are discussed in the review.

Social implications – Due to the behavioural changes that CSE could foster amongst students, it may help in the upbringing of responsible citizens who are free of health complications, who can make independent health-related decisions and look after each other in the community.

Originality/value – This review is an original contribution from the author. Whilst there is extant literature about CSE and youth development, this article fills the void by investigating the interdependent contributions that both the concepts can make to one another and encourages more research on this topic.

Keywords Sex education, Sexuality education, Youth development, Adolescent education programme, Family life education

Paper type Literature review

Comprehending youth

This section of the article first tries to provide an understanding of the period of being youth. The terms "childhood" and "youth" were inexistent in the middle ages as argued by Ariès. This is because childhood and youth were an integral part of adulthood. That is, children and youth were much a part of many everyday activities which the adults carried out (White *et al.*, 2017). For example, children and youth were as much a part of the workforce as they were with games and other leisure activities (Ariès, 1962). This claim by Ariès was questioned on the ground of its methodology. Ariès made his claims upon having analysed 15th and 16th century paintings where children and youth were framed as "little adults". However, the depictions were found to be of those belonging to the upper class and they lacked diversity in their representation (France, 2007). Hence, there is no particular definition for the term youth.

"Youth" has no particular universal definition (RGNIYD, 2017). This is because youth is considered a social construct. The physiological changes that occur in human development are termed as "puberty". Hence, youth is not biological. The psychological changes that accompany during puberty are referred to as "adolescence". Then, youth is not a psychological term as well. The age when transition takes place actually is called as "teenage", which saw its origin in the United States of America (USA) in the 1940s (Frith, 2005). Given these already existing terminologies, the term "youth" refers to a social category of people or a state of being associated with certain characteristics which are discussed in the following paragraphs.

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In the Western countries, youth is defined as the stage between childhood and adulthood. It is being identified as a transition period from being dependent to independent as they are being educated when they are children and youth (Kehily, 2007) which could later help them become independent. Whilst youth may carry many positive characteristics that are desired and coveted by the old people, albeit they carry various negative ones as well. Whilst on the one hand, when positive characteristics include strength, energy and beauty, on the other hand, negative characteristics include lack of experience and maturity, instability and an impetuous temperament (Jones, 2009).

The negative characteristics that youth are associated with are perhaps the reason that the American psychologist G. Stanley Hall famously called youth as a period of "storm and stress". Whilst Hall suggested that this "storm and stress" were due to the biological factors, Margaret Mead, one of the founding psychological anthropologists disagreed stating that it was culture and not biology that causes "storm and stress" in youth (Scheper-Hughes, 1984). Mead's book "Coming of Age" had various lessons for the industrialised Western societies to learn from. Amongst those lessons was the lesson that youth in the Western societies need to be given more freedom to explore and experiment. Mead brought a sexual revolution in the USA. However, the findings of Derek Freeman heavily contradicted the findings made by Mead and established that she was wrong (Scheper-Hughes, 1984). The next section of the review turns towards youth development.

Youth development

Youth development indicates "the process through which all young people seek ways to meet their basic physical and social needs and to build knowledge and skills necessary to succeed in adolescence and young adulthood" (Piha and Adams, 2001). So, the concept of youth development can be further discussed under the subtopics of a *process* of development, the *principles* and the *practices* which are associated with the concept of youth development (Hamilton *et al.*, 2004). The following paragraphs briefly discuss the subtopics so as to develop a better understanding of the concept of youth development and what it entails.

Youth development is identified as a *process*. This is because of the growing capacity of a young person to understand and act on the environment. Like the concept human development, youth development is "the natural unfolding of the potential inherent in the human organism in relation to the challenges and supports of the physical and social environments" (Hamilton *et al.*, 2004). In the usage, Hamilton *et al.* explain that it is similar to the child and adolescent development. Development lasts as long as life. Hamilton *et al.* suggest that when there is optimal development, youth are able to live a healthy, satisfying and a safe life.

In order for the youth to lead optimal development in their lives, they need to first thrive. Hence, the concept of youth development mends with a set of *principles* or a philosophy or an approach to help youth thrive through other individuals, organisations and institutions at the community level (Hamilton *et al.*, 2004). The set of principles are inclusivity or universality and a positive orientation that could build on the strengths of the youth, so that they could thrive to lead an optimal development. Youth development approach and the other approaches act which may be designed to prevent and treat risky behaviours of youth are somewhat analogous to public health and the medical treatment that people receive (Hamilton *et al.*, 2004). Hence, youth development approach and the other developed approaches become imminent for youth to thrive.

Next, we look at youth development as a *practice*. Youth development as a practice indicates the ways in which the principles of youth development (as mentioned in the aforementioned paragraph) are applied in programmes, organisations and initiatives. The aim here is to foster developmental process amongst youth (Hamilton *et al.*, 2004). Development occurs in families,

neighbourhoods, youth organisations, faith-based organisations, academic institutions and many other places including the cyberspace (Hamilton *et al.*, 2004).

Besides being a social process, Hamilton *et al.* suggest that youth development is also a movement. This movement helps to unify a wide range of discussions and the actions that emanate into policies and practice. So, in addition to the aforementioned three "*P*"s, namely, process, principles and practice, there is a fourth "*P*" that now emerges. This is *policy*. It denotes a course of action that is undertaken by an organisation. An example of this could be a government which acts on issues by introducing policies into the system. Youth development principles have been key informants for policy development at all levels of government (local, state and central/federal/national). It also informs different sectors and departments that have a focus on young people.

Youth development and education

The Ministry of Youth Affairs and Sports (2014) of India indicates that education is a fundamental right of all humans. It is because it enhances an individual's potential for development and social transformation. The youth policy also points out through the Article 26 of the Universal Declaration of Human Rights (UDHR) that education is a right for all individuals. The United Nations (UN) has brought forward a set of 17 Sustainable Development Goals (SDGs). These are goals that signatory countries have to achieve by the year 2030. One amongst the 17 goals is to provide "Quality Education" for all. It shows that the enrolment in primary education has reached 91% in the recent years globally. However, still one in four girls in the developing countries are not in schools and 103 m youth lack basic literacy skills. Of the 103 m, 60% are girls (UNDP, 2020a, b).

The United Nations Development Programme (UNDP) indicates certain targets which it aims to meet by the year 2030. Whilst one of them is to reduce gendered disparities in education, the other one is to provide a safe, gender-sensitive and an inclusive learning environment for all children (UNDP, 2020a, b). This means that youth who are male, female and also who are transgender, intersex, gender non-binary and gender non-conforming people will receive mandatory and quality education. It further indicates that youth of all sexes – male, female, intersex and transgender – and youth of all sexual orientations – lesbian, gay, bisexual, queer, questioning, pansexual, asexual, etc. (LGBQQPA+) – would be provided with such a learning environment that is inclusive, accepting all and does not discriminate or exercise prejudice against anyone.

India, according to its youth policy, has made significant investments to educate its youth owing to the fact that it concerns the cumulative national productivity (RGNIYD, 2017). Due to its firm focus on education, India has shown an incredible amount of improvement in its education and literacy levels, as mentioned in the youth policy. As India's demographic dividend is extremely high, the country is seeking its youth to be "educated, skilled and forward-looking" so as to contribute to the development of the country by and large. However, despite such a stark improvement in the Indian education scenario, India still faces a lot of problems not only in terms of gender parity but also in terms of sexual and gender-based violence, sexual and gender-based discrimination, prejudice and so much more that are shown with clear statistics.

Shocking statistics

The following statistics shall reveal the shocking state at which India is in with regards to sexual and gender-based crimes, discrimination and prejudice. India has one of the highest rates of untreated sexually transmitted infections (STIs) and very low rates of STI prevention or contraception use (O'Sullivan *et al.*, 2018). Indian children experience the highest rates of

sexual abuse and high rates of early marriage amongst girls. A national study revealed that 47% of Indian girls marry before attaining 18 years of age (O'Sullivan *et al.*, 2018). Also, an estimate of four million young women between the age group 15–19 years give birth to their children annually often with no space between two childbirths (O'Sullivan *et al.*, 2018). This means the girls are deprived of their right to education because they are being married off at a very early age, which prevents these girls from improving their own human capital and from being productive and contributing agents to the Indian economy. In addition, they seem to be used as machines to constantly reproduce, irrespective of their physical and psychological health.

Despite such schemes like "Beti Bachao Beti Padhao" by the federal government in India, still there is an increase in the number of women being subjected to sexual violence. Amongst every 100,000 women, data show that in 2018, 58.8% rape cases were reported (Mishra, 2020). The report also informs us that 51.9% of the victims are between the age 18 and 30 years and 27.8% below the age of 18 years. A staggering 94% of the sex offenders were known to the victim and every fourth victim is a minor (Press Trust of India, 2020).

There are no census data on the number of people who identify as lesbian, gay, bisexual, intersex, queer, asexual+ (LGBIQA+) in India. An unofficial source suggests the number as 104 m (Safi and Singh, 2019). Although inaccurate according to certain experts and activists, there are census data that there are 4.90 lakh or 490,000 transgender people in India (Nagarajan, 2014). Over 64% of the transgender people live in rural areas. Their literacy rate is just 46% when compared to the national literacy rate of 74% of the mainstream general population. Anjali Gopalan, a renowned LGBTIQA+ rights activist, in Nagarajan (2014) clarifies that this low literacy rate could be due to the level of prejudice, discrimination and harassment and the consequent dropouts that these individuals in particular face.

A recent study indicates that close to 99% of transgender people go through social rejection. Due to this, they are neither employed nor are they able to attend school (Moneycontrol News, 2018). In total, 96% are denied jobs due to which they resort to jobs such as sex work, begging and other undignified jobs (Moneycontrol News, 2018). To add on, the study points out that nearly 50–60% of the transgender youth have never attended school at all (Moneycontrol News, 2018). These data correspond to Gopalan's opinion as mentioned above. The study also shows 62% of the transgender youth are verbally abused at school and 15% are harassed by fellow students and the teachers of the transgender youth (Moneycontrol News, 2018).

Regarding the number of intersex people, there is a global estimate with which an Indian estimate could be arrived at. According to Anne Fausto-Sterling in Sax (2002), the commonality of an individual being an intersex person is 1.7%. In other words, according to Warnke (2001), the occurrence of intersexual children being born is between the range of 1 in 500 to 1 in 1,000. Sax critiques this statistic that it is based on a much broader classification and that the occurrence drops nearly 100 times to 0.018%. The Indian intersex community is considered to be falling under the transgender group, which is evident from India's Transgender Bill 2019 (Human Rights Watch, 2019). There is a claim that there are 10,000 intersex babies born in India every year (Banerji, 2019). Despite this consideration as in the report by the Human Rights Watch, there is no explicit mention *per se* about the intersex people in the bill, and the intersex people like the transgender people experience a lot of harassment, discrimination and prejudice in all spheres of life including the school atmosphere. This is despite the fact that the Supreme Court of India has ruled intersex and transgender people as the third gender with equal rights under the law.

Hence, from the aforementioned data, it is clear that the entire spectrum of the LGBTIQA+ community faces prejudice, discrimination, verbal abuse and harassment at school. A particular data indicated that fellow students and teachers involve in such activities. This proves the necessity then to analyse the quality of the content in our education and investigate that which is missing which elicits such activities like harassment,

prejudice, etc. An individual with just knowledge or expertise in a subject is just someone who could not be of use anywhere. However, it is an individual with culture that could be of use in society (Whitehead, 1967).

Looking at the information that the National Youth Policy 2017 provides, we are being made to believe that India is becoming fully educated – knowledgeable and cultured. However, from the aforementioned statistics, one is made to doubt if we are travelling towards the correct direction and progressing towards a situation of completely educated citizenry in India. This situation forces us to believe otherwise and question the quality of education that is being provided in India at primary, secondary and tertiary levels of education. It further makes one question, what lacks in the breadth of education that is currently being taught to students at educational institutions across levels. Before trying to fix the missing section in school education at least, we must develop an understanding of the concepts of gender, sex and sexuality which are explained in the following section.

Gender, sex and sexuality: a clarification

Sex and gender are interchangeably used despite being different but closely related terms (Meyer, 2010), thus warranting clarification. Gender is an important aspect of one's identity. Gender is a complex topic of discussion. However, the current research suggests that gender is a concept that is constructed, destructed and reconstructed from time to time by society (Nicholson, 1994). *Gender* that comes from the Latin word "*genus*" refers to the socially and culturally constructed attributes for being masculine or feminine (Stoller, 1972). Sex on the other hand refers to the biological organ that brings forth the difference of being a male or female (Hubbard, 1996; Kirschengast, 2014). What appears to be common in the various aforesaid iterations of sex and gender is that they iterate that there exist only two sexes – male and female – and that there exist only two genders – masculine and feminine – or in other words heterosexual. However, research shows the contrary. According to Davis and Preves (2017), some babies are born intersex or with a "doubtful" or an ambiguous sex (Williams, 1952; Anon, 2004).

The next term to be explored is "sexuality". Sexuality is understood as the totality of one's life as a sexual being. It is a social process. It is so because it talks about emotions, feelings, relationships, etc. Hawkins in Welbourne-Moglia and Moglia (1989, p. 159) defines sexuality as "*a part of an individual's life from conception to birth and therefore subject to lifelong dynamic change*". Mary Calderone says that "*Sex is what you do; sexuality is who you are*" (Allen and Rasmussen, 2017). This indicates sexuality has a deeper meaning than sex. In many places, sexual orientation is interchangeably used with sexuality (Meyer, 2010). This perhaps explains the reason why certain school officials react the way they do as aforementioned. Although many schools may seem to freely talk on sexuality or sexual orientation, they still remain straightest of the straight spaces (Allen, 2004; Epstein *et al.*, 2003).

Sex education and sexuality education

To clarify about *sex education*, there is a caveat that there is no standard definition for sex education. Sex education also known as "Sex Instruction" refers to the "sex hygiene" (Brickell, 2005). There are other understandings of sex education as that education or awareness an individual receives from parents, friends, relatives, media, etc. regarding sexual activity, avoiding unwanted teen pregnancies and prevention of STIs (deCoste, 2011; The Alan Guttmacher Institute, 2004; Altalib *et al.*, 2013). To this, Tjaden (1988) adds that sex education covers topics such as human reproduction, sexual health, the mechanics of sex and deviant sexual behaviour. This leaves us to explore the next term: *sexuality education*.

In 2018, the United Nations Educational, Scientific and Cultural Organization (UNESCO) introduced a global campaign to advocate comprehensive sexuality education (CSE). According to the UNESCO, CSE lays the foundation for life and love (UNESCO, 2018a, b). All nations are urged to follow CSE so as to tackle sexual violence amongst the various other aspects such as puberty, pregnancy, HIV/AIDS, etc. CSE helps individuals to take responsibility of their attitudes and behaviours towards their sexual and reproductive health (UNESCO, 2018a, b). CSE has expounded to have mitigated sexual activity, sexual risk-taking behaviour and STI/HIV infection rates amongst the youth in general (UNESCO, 2018a, b).

Sexuality education is generally reasoned as a more holistic approach in which sex education forms a part of. CSE, which is referred to as sex education in the global context is also referred to as family life education (FLE) or adolescent education programme (AEP) in India. It imparts values, views and exercises that may impact their family relationships (Tripathi and Sekher, 2013). CSE is depicted as (European Expert Group on Sexuality Education, 2016, p. 428)

> Learning about the cognitive, emotional, social, interactive and physical aspects of sexuality. Sexuality education starts early in childhood and progresses through adolescence and adulthood. It aims at supporting and protecting sexual development. It gradually equips and empowers children and young people with information, skills and positive values to understand and enjoy their sexuality, have safe and fulfilling relationships and take responsibility for their own and other people's sexual health and well-being.

However, Bruess and Greenberg (2014) provide the following description of sexuality education, contesting that it is multifaceted p. (19):

> Sexuality education is a lifelong process of acquiring information and forming attitudes, beliefs and values about such important identity relationships and intimacy.

Comprehensive sexuality education (CSE) in India

Although the UNESCO has urged nations across the world to oblige with its guidance and deliver sexuality education, in India, AEP was stopped in 2007 after a brief introduction in the school curriculum in 2005. Across India, as many as 11 states opposed the delivery of CSE at schools and withdrew the same from their school curriculum (Tripathi and Sekher, 2013). This was due to the lack of political will and other oppositions received from the religious and cultural fronts without any scientific basis to their claims (Vahia and Anand, 1998). On the contrary, there is a rising need for CSE programmes in India amongst the youth (Avachat *et al.*, 2011). Owing to this, AEP was updated by the National Council of Educational Research and Training (NCERT) and the United Nations Population Fund (UNFPA) and implemented in the Indian states of Bihar, Odisha, Madhya Pradesh, Maharashtra and Rajasthan. However, it is not a compulsory part in the curriculum (Das, 2014).

In India, the CSE programme talks about topics such as sexual harassment. However, as Das identifies, the curriculum (mis)informs the learners about two sections of the Indian Penal Code (IPC): sections 354 and 356. The curriculum says that IPC sections 354 and 356 are used to criminalise an attempt to rape. While actually these two aforementioned sections criminalise sexual harassment. This indicates that the CSE curriculum interchangeably used the concepts of rape and sexual harassment. It also reduces domestic violence to wife-beating in one of the case studies (Das, 2014). Although domestic violence between a heterosexual couple exists, domestic violence can affect any person especially of vulnerable groups.

Although the CSE programme that currently exists in the school curriculum discusses sexual orientation, it still privileges heteronormativity (Das, 2014). As Das iterates, there is no mention of the words "gay", "lesbian", "homosexuality", etc. in the curriculum, except for in

the section of HIV where the term "men who have sex with men" finds a mention. This is a problem besides the ones discussed above that the CSE programme lacks inclusivity and privileges heteronormativity (Das, 2014). This gives rise to the invisibility of the gender and sexual diversity that exists in the nature and promoting stigma and prejudice when homosexuality has been judicially legalised in India. The other forms of sexual and gender diversity that should be mentioned in the CSE programme is about transgender and intersex people along with sexualities like pansexuality, bisexuality, asexuality, etc.

In addition to the inclusion of gender and sexual diversity in the CSE programme, there is a dire need for the inclusion of the people with disabilities (differently abled) as well. People who are differently abled are mentioned in the introduction and then there is no mention of them in the entire text of the CSE including in the case studies and the activities (Das, 2014). This means that people with disabilities are considered as an invisible population in the mainstream discourses. Similar to the mainstream schools, the special schools for the differently abled do not have a good-quality, age-appropriate, scientific CSE programme in place, which is also a cause for concern (Das, 2014).

Youth development and CSE

As part of youth development, sexual feelings and behaviours which begin in adolescence must be recognised (Russell and Andrews, 2003). However, people often connote these adolescent sexual feelings and behaviours to promiscuity, teenage pregnancy, premature sexual activity and such other negative activities. Instead these activities could be associated with more developmentally appropriate signs of adolescent exploration and intimacy such as a kiss on the cheek or holding hands and the like (Russell and Andrews, 2003). Similarly, whilst on the one hand, our society values "being sexy", on the other hand, it warns youth from being sexy. This often gives youth very mixed messages and perplexes them as to what is correct and what is not. Parents play the most important role in creating these perplexing messages, thinking that their children learn sexual behaviour, attitudes and values from other children (Russell and Andrews, 2003).

Hence, youth require consistent and congruent information about their developing adolescent sexuality by recognising the mixed and inconsistent messages that youth receive from various avenues of society which mainly includes parents. Like youth development, sexuality is also a process during which youth undergo a continuous development in their body and psyche. CSE, as we have seen above could definitely be able to help address the myriad perplexities that youth may otherwise have regarding their developing sexuality within the youth development approach. Youth development's principle is to make youth thrive in their relationships with other youth individuals, organisations and communities by and large. Similar to the characteristic of youth development as a practice, notions about sexuality and other related concepts about sexuality should be put to the youth in the practical context with the help of CSE, so that youth could develop an understanding about their self by and large and become responsible youth to face tomorrow's worldly challenges in the most effective way.

Conclusion

Youth development is a very important concept that is to be adopted so that all the youth are able to live through a dynamic life, thrive in society and succeed in their relationships at various levels of the community. For this to happen, youth development needs to take the form of education. And, children do go through an educational process of primary, secondary and tertiary education. This essay finds that this education is not enough. It does only provide youth with knowledge and not with the culture that makes youth as civilised humans. With

the shocking statistics, it is evident that something is lacking in the current system of education – CSE.

The CSE programmes have become absolutely necessary for the better and holistic development of youth to become cultured and civilised youth, so that they could become responsible citizens of tomorrow's world. The CSE programme in India had faced its unfortunate wrap up in 2007. This should not be repeated again, and CSE should be made mandatory in all schools across India. All CSE programmes in India should be of good-quality, scientific, culturally relevant, age-appropriate and holistic. It should be taught by well-qualified instructors. By this way, well-rounded and responsible citizens who are concerned about theirs and others' sexual and reproductive health and well-being could be come by, thus decreasing the rates of atrocities as the shocking statistics revealed.

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About the author

Hari Hara Sudhan Ramaswamy is an alumnus of the University of Madras and the Rajiv Gandhi National Institute of Youth Development (RGNIYD) both in India. Their prime research interests are gender and sexuality intersecting with education, health, human resources and law. They are an emerging author in this field. They were a recipient of Monash University's bursary to attend Harvard University's World MUN 2007 and were featured twice in *The Times of India's Education Times* supplement in their college editorial board (CEB) with Hari's article on climate change featured in 2009. Hari is currently working towards their research degree. Hari Hara Sudhan Ramaswamy can be contacted at: harihs.research@gmail.com

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Parent-adolescent communication on sexual and reproductive health among school adolescents of Woldia town, Ethiopia by the year 2019

Seteamlak Adane Masresha and Gedefaw Diress Alen
Woldia University, Woldia, Ethiopia

Abstract

Purpose – The purpose of this paper is to assess the magnitude of parent-adolescent communication on sexual and reproductive health (SRH) issues and its association with gender and premarital sexual practice among school adolescents of Woldia town.

Design/methodology/approach – School-based cross-sectional study was conducted on 368 unmarried secondary and preparatory school adolescents (15–19 years) in Woldia town. Simple random sampling was employed to select study participants. Self-administered questionnaire was used. Data were entered by EPI-Data version 3.0.2 and analyzed by using SPSS version 20.

Findings – In this study, 56.3% of school adolescents had parental communication on sexual and reproductive health issues. The result of this study showed that adolescents who had history of sexual intercourse where 64% less likely to communicate with parents on sexual and reproductive health issues (AOR: 0.36 95% CI: 0.20, 0.65), but there was no association between gender and sexual and reproductive health communication between adolescent and parent (AOR: 1.06, 95% CI: 0.64, 1.75).

Originality/value – Parent-adolescent communication about sexual matters is one of the means that encourages adolescents to adopt responsible sexual behavior. Many children in Africa are uncomfortable to have a communication about sexual and reproductive health issues with their parents because the subject is a taboo topic in most homes.

Keywords Adolescents, Sexual health, Communication, Reproductive health

Paper type Research paper

Abbreviations/Acronyms

AIDS	Acquired Immunodeficiency Syndrome
AOR	Adjusted Odds Ratio
COR	Crude Odds Ratio
ETB	Ethiopian Birr
HIV	Human Immunodeficiency Virus
PAC	Parent Adolescent Communication
SRH	Sexual and Reproductive Health
STIs	Sexually Transmitted Infections

Introduction

In recent times, adolescents aged 10–19 years are confronted with several health threats which have been observed to be predominantly behavioral. Behaviors formed at the time of adolescent exposes them to consequences of unprotected sex, unsafe abortion, sexually transmitted infections (STIs) and substance use (World Health Organization, 1999). Many adolescents at early age engage in risky sexual behaviors like unprotected sex and having multiple sexual partners (Negera *et al.*, 2017). This necessitates discussions and parental

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provision of appropriate information on sexual matters because parents are central in providing correct information for the positive development of young generation (Seloilwe *et al.*, 2015; Shahid and Ah Sh, 2017).

Parent-adolescent communication (PAC) about sexual and reproductive health (SRH) issues can improve contraceptive utilization and communication about sex which minimizes sexual risk behaviors among adolescents (Lagina, 2010; Namisi *et al.*, 2013). Age appropriate and evidence-based SRH education is important to prevent and reduce the risks of adolescent pregnancy and STIs (Breuner *et al.*, 2016).

Communications on SRH issues is not a common practice between parents and adolescents even in urbanized areas of Ethiopia. This highlights the risk of unintended pregnancies and STIs among adolescents (Yibrehu and Mbwele, 2020). Globally, nearly two million adolescents were living with human immunodeficiency virus (HIV) in 2016 (Organization, 2018). In 2018, 510,000 young people between the ages of 10 and 24 were newly infected with HIV, of whom 190,000 were adolescents between the ages of 10 and 19 (UNICEF, July 2019). In Ethiopia, nearly 4% of women and 7% of men between the ages 15 to 19 had premarital sexual practice, though the rate of HIV testing among those groups was less than 25% (Ethiopia and Macro, 2016) with a high prevalence of teenage pregnancies (7.7%) (Mathewos and Mekuria, 2018).

Study showed that children who receive SRH education at home are less likely to engage in risky sexual activities. Having open communications with children about sex and other matters is healthy and safer in the long run (SickKids Staff, Accessed Sep 9, 2019). However, PAC on SRH issues were influenced by parents embarrassment in discussing sexual topics, a believes that sexual discussions were not age appropriate, cultural barriers, age differences, sex differences, lack of skills and SRH information (Guilamo-Ramos *et al.*, 2012; Mkandawire and Iipinge, 2017; Yibrehu and Mbwele, 2020). To improve PAC, school-based education of adolescents and parental trainings on how to discuss SRH issues with their children are important (Mkandawire and Iipinge, 2017).

PAC on SRH issues varies across and within countries. It reached to 71% in USA (Widman *et al.*, 2014), 21% in Tanzania (Muthengi *et al.*, 2015), 9.5% in Nigeria (Ojebuyi *et al.*, 2019), 90% in Zambia (Haakonde *et al.*, 2018), 61% in Ghana (Esantsi *et al.*, 2015) and 19% in Rwanda (Bushaija *et al.*, 2013). In Ethiopia, PAC on SRH matters among secondary and preparatory school students varied by setups like 47% Oromia (Habte *et al.*, 2019), 28.9% in BenishangulGumuz (Yesus and Fantahun, 2010), 68.5% (Mekie *et al.*, 2019) and 82.7% in Amhara region (Chane and Cherie, 2018). Previous studies conducted in Ethiopia showed that the prevalence of PAC on SRH issues were inconsistent, which ranges from 25 to 83% (Shiferaw *et al.*, 2014; Mekonen *et al.*, 2018; Ayalew *et al.*, 2014; Kusheta *et al.*, 2019; Chane and Cherie, 2018; Tesso *et al.*, 2012). Previously conducted studies have tried to identify different factors affecting PAC on SRH issues, but regarding gender and premarital sexual practice, they have reported mixed results in the same groups of populations. According to study findings, gender had a positive relationship with communication on SRH (Chane and Cherie, 2018; Ayehu *et al.*, 2016), while other studies showed no association (Shiferaw *et al.*, 2014; Mekonen *et al.*, 2018; Ayalew *et al.*, 2014; Kusheta *et al.*, 2019). Premarital sexual practice was positively linked with SRH communication between parent and adolescent (Shiferaw *et al.*, 2014; Mekonen *et al.*, 2018), while other studies findings suggested that there was no association (Ayalew *et al.*, 2014; Kusheta *et al.*, 2019; Chane and Cherie, 2018; Ayehu *et al.*, 2016). So, this study aimed to assess the magnitude of PAC on SRH issues and its association with gender and premarital sexual practice among school adolescents of Woldia town.

Methods

Study settings and period: The study was conducted in Woldia secondary and preparatory school, Woldia town, Amhara region, Ethiopia. Woldia is found 521 km from Addis Ababa on the high way to Mekelle. The total population of Woldia town was 46,139 with sex distribution of 50.2% females and 13,027 found in the age group of 15–24 (Commission, 2008). In Woldia town, there was one preparatory (Woldia) and two high schools (Woldia and Millennium). Accordingly, there were a total of 3,434 high school and 1,557 preparatory school students in the town (North Wollo Zone Education Bureau, 2018). The study was conducted from April 25–30/2019.

Sampling techniques and procedure: Simple random sampling procedure was used to select a representative samples by using the roster of students as a sampling frame. From the two high schools which have students of grades 9 and 10, one high school was randomly selected by the lottery system whereas the preparatory school was purposively included. Based on the number of students, proportional allocation was allotted. All unmarried regular students, not blind or not having known visual impairment were included in the study.

Study design and sample size determination

School based cross-sectional study was conducted. The sample size was determined by using single population proportion formula with a confidence interval at 95%, 5% desired precision, 5% non-response rate and proportion of adolescents who had communication on SRH issues with their parents (35%) (Kusheta *et al.*, 2019). A total of 368 (198 secondary and 170 preparatory school) students were included.

Data collection methods and instruments: Data were collected by using structured self-administered Amharic questionnaires with close-ended items. A pre-test was done on 5% of the sample size in Sirinka secondary and preparatory school to know the length, content, question-wording and language understandability of the tool before two weeks of the actual data collection time. Data from the pre-test were not included in the analysis. The tool was developed from different literatures. The questionnaire was designed in English initially and translated to Amharic language. Five fourth-year university students, who were the data facilitators, collected the data after having one-day training about the objectives of the study.

Study variables

In this study, one outcome variable was created (Parent-adolescent communication on SRH issues-Yes/No)*:* Premarital sex and gender were the main exposure variables. Students age**,** religion, parents' educational status, parents' occupation, ethnicity, family size, family monthly income, residence, grade level of the students, family income, having a sexual relationship, family size and monthly pocket money received from family were considered as covariates.

Data processing and analysis: Data cleaning and entry was performed by using EpiData version 3.0.1 and was analyzed by using SPSS-20. To assess the association; variables with p-value < 0.2 in Bivariable logistic regression were entered into multivariable logistic regression analysis and those exposure variables with a p-value ≤ 0.05 in multivariable logistic regression analysis was considered statistically significant.

Ethical consideration

Permission and ethical clearance was obtained from Woldia University College of Health Science ethical review committee. Written and informed consent was obtained from the school directors who were expected to be the guardian for participants at the school

environment. After having permission from school directors, information was collected. Moreover, participation for the study was fully voluntary.

Operational definition/definition of terms

Parents: Biological parents (father and mother), grandparents, elder sisters/brothers and any other caretakers without being paid as an employee

Adolescent: Unmarried peoples who are between 15 and 19 years old.

Communication: Refers to the exchange and sharing of knowledge, ideas, and other information concerning SRH issues among adolescents and their parents.

Communication on SRH: Students who discussed at least two SRH issues (Contraceptive, STIs/HIV/AIDS, Unwanted pregnancy and premarital sex) with their parents in their lifetime.

Preparatory school: A school which provide education for grade 11 and 12 students.

Findings

A total of 368 contacts were made, whereby nine declined to participate, making the total number of respondents to be 359 (97.6%). Of the nine who declined to participate, three were because of not answering communication questions, five were because they did not respond the questionnaires and one were because he/she returned the questionnaire unfilled. The mean age of participants were 17.08(SD ± 1.33) years old (median age 17 years), and 82.3% were Orthodox Christianity followers. Among the total sample, 54.04% were high school students (grade 9 and 10) and 53.2% were female (See Table 1).

Adolescent parent communication on SRH issues

The majority of the adolescents, 297(82.7%), believed that discussing SRH issues with parents is important, though the level of communication with at least two SRH issues in this study was 56.3%. Nearly 47% of males and 61% of those who had premarital sexual intercourse were communicated on contraceptive and unwanted pregnancies, respectively. Around 85% of female and 84% of those who had sexual experience believed the importance of discussion on SRH issues (See Table 2). Majority (52.6%) of the study participants discussed STIs including HIV/AIDS with their parents (See Figure 1).

Association of gender and premarital sex with adolescent-parent communication on SRH

Pre-marital sexual practice was significantly associated with adolescent-parent communication. Those who had premarital sexual experience were, 64%, less likely to communicate with their parents about SRH issues (AOR 0.36, 95% CI: (0.20, 0.65)) than those who had no exposure. Whereas, there was no significant association between gender and adolescent-parent communication on SRH (AOR: 1.06, 95% CI: 0.64, 1.75) (See Table 3).

Discussion

This study showed that 56.3% of adolescents who participated in the study had communicated with their parents. This result wa slower than studies conducted in USA (Widman *et al.*, 2014), Ghana (Esantsi *et al.*, 2015) and Zambia (Haakonde *et al.*, 2018). The reason may be associated with differences in culture, socioeconomic development and studied populations, whereby the study in Zambia included adolescents of highly educated families. In this study, PAC on SRH issue was higher than studies conducted in different regions of Africa (Ojebuyi *et al.*, 2019; Bushaija *et al.*, 2013; Muthengi *et al.*, 2015). The discrepancies may be resulted from gaps in study area and period, number of dimensions and timing used to definePAC and differences in the source populations of the study.

Variable	Category	Parent- Adolescent communication on SRH: Frequency (%) Yes	No
Gender (N = 359)	Male	102 (60.7)	66 (39.3)
	Female	100 (52.4)	91 (47.6)
Age (N = 359)	15–17	99 (48.3)	106 (51.7)
	18–19	103 (66.9)	51 (33.1)
Grade level (N = 359)	9th	53 (51.5)	50 (48.5)
	10th	29 (31.9)	62 (68.1)
	11th	72 (72)	28 (28)
	12th	48 (73.8)	17 (26.2)
Residence (N = 359)	Urban	196 (56.2)	153 (43.8)
	Rural	6 (60)	4 (40)
Religion (N = 359)	Orthodox	170 (56.9)	129 (43.1)
	Muslim	31 (55.4)	25 (44.6)
	Protestant	1 (25)	3 (75)
Having boy/girlfriend (N = 359)	Yes	91 (59.9)	61 (40.1)
	No	111 (53.6)	96 (46.4)
Student monthly pocket gain form family (N = 359)	<500 ETB	153 (52.8)	137 (47.2)
	≥500 ETB	49 (71)	20 (29)
Educational status of father (N = 359)	Can't read and write	16 (57.1)	12 (42.9)
	Read and write	64 (48.9)	67 (51.1)
	Completed primary education	15 (53.6)	13 (46.4)
	Completed secondary	28 (59.6)	19 (40.4)
	Diploma	14 (70)	6 (30)
	Degree and above	65 (51.9)	40 (38.1)
Educational status of mother (N = 359)	Can't read and write	23 (46)	27 (54)
	Read and write	63 (54.8)	52 (45.2)
	Primary education	29 (65.9)	15 (34.1)
	Secondary	23 (62.2)	14 (37.8)
	Diploma	16 (64)	9 (36)
	Degree and above	48 (54.5)	40 (45.5)
Occupational status of father (N = 359)	Private work	44 (63.8)	25 (36.2)
	Merchant	43 (57.3)	32 (42.7)
	Farmer	32 (39.5)	49 (60.5)
	Government employed	83 (61.9)	51 (38.1)
Occupational status of mother (N = 359)	House wife	99 (53.9)	68 (40.7)
	Private work	25 (53.2)	22 (46.8)
	Merchant	29 (50)	29 (50)
	Farmer	6 (31.6)	13 (68.4)
	Government employed	43 (63.2)	25 (36.8)
Family size per household (N = 358)	<5	77 (55)	63 (45)
	≥5	124 (56.9)	94 (43.1)
Family monthly income (N = 353)	<500	1 (100)	0
	500–1,000	23 (63.9)	13 (36.1)
	1,001–2,500	18 (58.1)	13 (41.9)
	>2,500	98 (61.2)	62 (38.8)
	Don't know	58 (46.4)	67 (53.6)
Ever had sex (N = 359)	Yes	75 (76.5)	23 (23.5)
	No	127 (48.7)	134 (51.3)
		202 (56.3)	157 (43.7)

Note(s): ETB: Ethiopian Birr

Table 1. Characteristics of the study participant by parent-adolescent communication on sexual and reproductive health among Woldia town school adolescents, 2019

The result was also lower than a study conducted in Haik Town (82.7%) (Chane and Cherie, 2018); this might be linked with the definition of PAC on SRH issues in which at least communicating in one SRH issue was sufficient in that study. The finding was also higher than studies conducted in different parts of Ethiopia like Hadiya (35%) (Kusheta *et al.*, 2019), Woldia (30.4%) (Mekonen *et al.*, 2018), Debremarkos (36.9%) (Shiferaw *et al.*, 2014),

Diredewa (37%) (Ayalew *et al.*, 2014), Awabel (28.8) (Ayehu *et al.*, 2016), Harar (28.8%) (Yadeta *et al.*, 2014) and East Wollega (42.5%) (Tesso *et al.*, 2012). The higher the magnitude on the level of communication in this study compared with the study in Hadiya and Awabel may be related with the study participants, whereby more than 28% of those study participants were from rural settings (Kusheta *et al.*, 2019; Ayehu *et al.*, 2016), which might decrease the opportunities to SRH information which can further reduce to communicate with their parents. High magnitude of SRH communication between parent and adolescent in this study when it compared with studies conducted in Debremarkos, Dire Dewa, East Wollega and Woldiaand Harar (Shiferaw *et al.*, 2014; Ayalew *et al.*, 2014; Tesso *et al.*, 2012; Mekonen *et al.*, 2018; Yadeta *et al.*, 2014) may be due to difference in study period, definition of time period to state there was PAC and differences of participants' grade level included in the study.

The result of this study showed that there was a significant but negative association between premarital sexual practice and PAC on SRH issues. Adolescents who had a history of sexual intercourse were 64% less likely to communicate with parents (AOR: 0.36, 95% CI: 0.20, 0.65), which was inconsistent with studies done in Woldia and Debremarkos (Mekonen *et al.*, 2018; Shiferaw *et al.*, 2014). The reason may be due to fear to communicate about SRH issues with their parents after they have already engaged in premarital sex. This could been attributed with adolescents doing everything secretly and share SRH information to their friends than parents, as parents have ignorant behaviors on SRH issues (Yibrehu and Mbwele, 2020). Previous evidences showed that adolescents who were engaged in

SRH issues discussed		Gender: Frequency (%) Male	Female	Ever had sex: Frequency (%) Yes	No	Total
Contraceptive	Yes	79 (47.0)	79 (41.4)	56 (57.1)	102 (39.1)	158 (44.0)
	No	89 (53.0)	112 (58.6)	42 (42.9)	159 (60.9)	201 (56.0)
STIs including HIV/AIDS	Yes	100 (59.5)	89 (44.6)	66 (67.3)	123 (47.1)	189 (52.6)
	No	68 (40.5)	102 (53.4)	32 (32.7)	138 (52.9)	170 (44.4)
Unwanted pregnancy	Yes	74 (44.0)	85 (44.5)	60 (61.2)	99 (37.9)	159 (44.3)
	No	94 (56.0)	106 (55.5)	38 (38.8)	162 (62.1)	200 (55.7)
Premarital sex	Yes	82 (48.8)	82 (42.9)	59 (60.2)	105 (45.7)	164 (45.7)
	No	86 (51.2)	109 (57.1)	39 (39.8)	156 (59.8)	195 (54.3)
Importance of discussion on SRH issues with parent	Yes	134 (79.8)	163 (85.3)	82 (83.7)	215 (82.4)	297 (82.7)
	No	34 (20.2)	28 (14.7)	16 (16.3)	46 (17.6)	62 (17.3)
Condom use at first sex	Yes			47 (48.0)		
	No			51 (52.0)		

Note(s): STIs-Sexually transmitted infections, SRH-Sexual and reproductive health

Table 2. Discussion on different sexual and reproductive health issues between adolescent and parent among Woldia town school adolescents, 2019

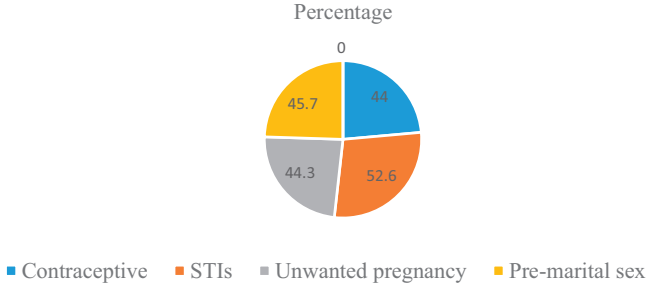

Figure 1. Discussion on different sexual and reproductive health issues between adolescent and parent among Woldia town school adolescents, 2019

Variable	Category	Communication on SRH issues with parents COR (95% CI)	AOR (95% CI)	*p*-value
Gender	Male	1	1	
	Female	1.41 (0.92, 2.14)	1.06 (0.64, 1.75)	0.82
Ever had sex	Yes	0.29 (0.17, 0.49)**	*0.36 (0.20, 0.65)**	0.001
	No	1	1	
Age	15–17	1	1	
	18–19	0.46 (0.30, 0.71)**	0.69 (0.38, 1.25)	0.22
Grade	9th	1	1	
	10th	2.27 (1.26, 4.07)	1.84 (0.96, 3.58)	0.08
	11th	0.23 (0.23, 0.74)*	*0.33 (0.16, 0.68)**	0.003
	12th	0.38 (0.19, 0.74)*	0.44 (0.18, 1.04)	0.06
Student monthly pocket gain form family	<500 ETB	1	1	
	≥500 ETB	0.46 (0.29, 0.81)	0.80 (0.41, 1.56)	0.51
Mother's education	Can't read and write	1	1	
	Read and write	0.70 (0.36, 1.37)	0.54 (0.24, 1.19)	0.12
	Primary education	0.44 (0.19, 1.02)	0.46 (0.18, 1.19)	0.11
	Secondary	0.52 (0.23, 1.23)	0.60 (0.21, 1.67)	0.32
	Diploma	0.48 (0.19, 1.29)	0.56 (0.17, 1.82)	0.34
	Degree and above	0.71 (0.35, 1.43)	0.63 (0.25, 1.56)	0.32
Father's occupation	Private work	1	1	1
	Merchant	1.31 (0.67, 2.56)	1.14 (0.54, 2.43)	0.73
	Farmer	2.69 (1.39, 5.23)	*2.77 (1.26, 6.08)**	0.01
	Government employed	1.08 (0.59, 1.98)	0.70 (0.34, 1.43)	0.32
Mother's occupation	House wife	1	1	1
	Private work	1.28 (0.67, 2.46)	1.17 (0.55, 2.52)	0.68
	Merchant	1.46 (0.80, 2.65)	1.29 (0.65, 2.55)	0.47
	Farmer	3.15 (1.14, 8.71)*	1.43 (0.40, 5.13)	0.58
	Government employed	0.85 (0.47, 1.51)	1.29 (0.60, 2.76)	0.52

Note(s): SRH-Sexual and Reproductive Health, ETB-Ethiopian Birr; NB: only variables with a *p*-value of less than 0.2 at the bivariable analysis were included in the final model
*$p < 0.05$, **$p < 0.001$

Table 3.
Bivariable and multivariable logistic regression analysis of factors associated with adolescent-parent communication on SRH issues among Woldia town high and preparatory school students, 2019

premarital sexual practice were those who had no discussion of sexual issues with their parents (Behulu *et al.*, 2019), which might expose them not to be confident in resisting peer pressures to engage in sex (Behulu *et al.*, 2019; Mulugeta and Berhane, 2014; Meleko *et al.*, 2017). In addition, majority of those who were engaged in premarital sex in this study (55%) and in study conducted in Jimma Town (Abate *et al.*, 2016) were those aged 18 and above which might further influence them to prefer their friends than families to talk different issues.

This study identified that there was no association between gender and SRH communication between parent and adolescents (AOR: 1.06, 95% CI: 0.64, 1.75). The result was in line with studies done in different parts of Ethiopia (Shiferaw *et al.*, 2014; Mekonen *et al.*, 2018; Ayalew *et al.*, 2014; Kusheta *et al.*, 2019; Tesso *et al.*, 2012). The possible explanation could be the introduction of school-based SRH education, which might have filled gender gaps across the different regions in Ethiopia on SRH communication. Recently, adolescents became more open minded to talk on sexual issues, which might avoid gender-related differences in different aspects of health.

In this study, 98 adolescents (27.3%) had premarital sexual intercourse though the rate of condom utilization at first sex was below 50%. This also implies that a number of

adolescents are engaging themselves to risky sexual behaviors. This implies the presence of high risk of unintended pregnancies and STIs among adolescents. Efforts should be made to avert adolescent's risky behaviors by promoting PAC on SRH issues through parental trainings on how to discuss SRH issues with their children and integrated school-based SRH education

Limitations

Since respondents' were asked about discussion on SRH issues in their past time, recall bias might have been occurred. This could under- or over-estimate communication of SRH issues. This study also did not address participant's knowledge on SRH issues, which may affect the outcome variable.

Conclusion and recommendations

Adolescent-parent communication about sexual and reproductive health issues was moderate in Woldia town. Parental communication was significantly lower among adolescents who were engaged in premarital sex. To enhance SRH communication between parents and adolescents, training should be given for parents on how to discuss SRH issues with their children. Educational institutions should provide sufficient information which influences teens to talk on SRH issues with parents. Emphasis should be also given to avert premarital sexual practice in adolescents.

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Ethical approval and consent to participate: Permission and ethical approval letter was obtained from Woldia University College of Health Science ethical review committee. Written and informed consent was obtained from the school directors who were expected to be the guardian of participants in the school environment. Informed verbal consent was taken from all the respondents.

Consent for Publication: This manuscript doesn't contain any individual/personal data in any form; so it doesn't need consent for publication.

Availability of data and Materials: The data set used and analyzed for the study is available from the corresponding author on reasonable request. The Investigators are responsible for all information provided to the journal.

Competing interest: No competing interest.

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Authors' contributions: SAM and GDA wrote the proposal, participate in the data collection and entry processes, analyzed the data, drafted the manuscript, have read and approved the manuscript.

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Corresponding author
Seteamlak Adane Masresha can be contacted at: gg_adane@yahoo.com

Why medical journalism wins public health journalism: systems thinking recommendations for health-promoting media

Samira Mohammadi and Ali Ramezankhani
School of Public Health and Safety, Shahid Beheshti University of Medical Sciences, Tehran, Iran
Ali Montazeri
Health Metric Research Center, Iranian Institute of Health Sciences Research, ACECR, Tehran, Iran
Akbar Nasrollahi
Islamic Azad University (IAU), Central Tehran Branch, Tehran, Iran, and
Nastaran Keshavarz Mohammadi
School of Public Health and Safety, Shahid Beheshti University of Medical Sciences, Tehran, Iran

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Abstract

Purpose – Health-related issues are widely covered in news agencies by medical and health journalists. The quantity, format and quality of their coverage influence the general public as well as policymakers and professions. Current studies and observations suggest that news agencies are more dominated by medical topics (disease, symptoms, epidemiology, treatment and medicines) than general public health issues (risk prevention, health protection, education and promotion). This study explores the causes of the current situation in Iran and generates solutions for supporting health-promoting media that may also prove beneficial for other countries.

Design/methodology/approach – A qualitative study was conducted to explore the coverage of health-related topics in selected news agencies. Stakeholders, including health journalists, health professionals and public relations staff at the Iranian Ministry of Health and Medical Education were interviewed. Data were collected until data saturation was reached. The transcripts of all the 17 interviews conducted were analyzed using conventional content analysis.

Findings – Four groups of causes were identified, including individual factors, organizational factors, socioeconomic factors and the different nature of medicine and public health. The participants proposed several solutions that were classified into three categories, including the empowerment of stakeholders through capacity development, organizational change and mutual communication and culture change.

Originality/value – Creating health-promoting media is a complex but urgent task, and providing a comprehensive and deep understanding of the dynamic interdependencies of the multiple factors at play in it and developing and implementing the most effective interventions for it requires a systematic approach.

Keywords Health-promoting media, Healthjournalism, Medical journalism, Health promotion, Systems thinking

Paper type Research paper

1. Introduction

In the 21st century, the media has a unique and undeniable role in the provision of information and knowledge and shaping people's perceptions, beliefs, values, opinions,

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behaviors and decision-making in different aspects, including health (McIntosh and Blalock, 2005; Carducci *et al.*, 2011; Dugassa, 2016; Olumide and Ojengbede, 2016; Yoo *et al.*, 2016; Donaldson *et al.*, 2017). Health is a crucial news category covered by all media outlets (Hodgetts *et al.*, 2008; Ghanta, 2012). The media presents various health-related information and knowledge on all levels, from prevention and diagnosis to the treatment of diseases and rehabilitation (Metcalfe *et al.*, 2011; Hallin *et al.*, 2013). It can therefore act as a strong and effective communication channel in the field of health (Hovsepyan *et al.*, 2015). There is a great demand and need in the world for accurate, relevant, fast and impartial health information (Gupta and Sinha, 2010). The quantity and format of news coverage influence not only the general public but also policymakers (Schooler *et al.*, 1996; Rachul and Caulfield, 2015; Bou-Karroum *et al.*, 2017). Health-related issues are widely covered in the mass media by medical journalists or health journalists as news, stories or education-oriented content. Studies on the subject of health coverage in the media have shown that, often, the media is focused on secondary and tertiary health while leaving primary prevention coverage wanting (Metcalfe *et al.*, 2011). Current studies and observations suggest that the media is more dominated by medical topics (disease, symptoms, epidemiology, treatment and medicines) than general public health issues (risk prevention, health protection, health education and health promotion); (Tong *et al.*, 2008; Lemal *et al.*, 2013; Heng and Vasu, 2010). In other words, medical journalism, which is disease-oriented, wins over health journalism, which is health-oriented/well-being–oriented. A limited number of studies (Taghdisi *et al.*, 2009; Keshavarz *et al.*, 2014), including the first phase of the study reported in this paper (the results of which will be published in a separate paper), indicate that the same is true about Iran. It seems that the media is more disease-promoting than health-promoting. The opportunities provided through the media to guide public health education and promotion often remain neglected (Heng and Vasu, 2010). Furthermore, little is known about the causes, factors, actors and processes leading to the dominance of medical news over public health news and content, and such knowledge is crucial for changing the current pattern (Hodgetts *et al.*, 2008) and establishing health-prompting media. Therefore, the study reported here partly, conducted to help fill this knowledge gap. Considering the complexity of issue, a qualitative approach was included to explore deeply the root causes and multiple perspectives toward the solutions.

2. Methods

2.1 Study design and objective

This qualitative study was part of a sequential mixed method study, conducted from September 2018 to March 2019 in Tehran. The purpose of this qualitative study was to understand why the media, in particular, news agencies, are dominated by medical news from the perspective of the diverse stakeholders of the media and health fields. The study also aimed to provide recommendations for the development and support of health-promoting media.

2.2 Participant

Participants were experts with experience and knowledge of the subject matter. Purposeful sampling was conducted to recruit the participants with maximum variation sampling in terms of age, gender, job position and experience. Inclusion criteria for the study included public relations managers of health-oriented organizations and health journalists with at least one year of work experience in the field of health and health professionals with experience in the media.

2.3 Procedure

Participants were explained about the objectives of the research before each interview and then invited to participate and were informed that they could withdraw from the study at any

time. Data were collected through in-depth semi-structured interviews by the first researcher (SM). The time and place of the interview were chosen by the participants. The average interview time was 37 minutes (25–55 minutes).

After obtaining the ethics approvals and participants' consent, the interviews were conducted by one of the researchers (S. M.) at participants' workplace and were centered around two key questions, "Why are Iranian news agencies dominated by medical news compared with public health news?" and "What are potential solutions to change this situation?" The interviews were conducted in Persian and recorded and transcribed immediately after each session by the same researcher (S. M.). In order to plan the interview procedure, two pilot interviews were held, which did not lead to the modification of the interview guide. The data reached saturation after 15 interviews, but two more interviews were held afterward, making for a total of 17 interviews with 17 people, including six health journalists, five public relations staff working in health facilities and six health professionals. Demographic characteristics of the participants are given in supplementary 1.

2.4 Analysis approach

The transcribed interviews provided the data set. The transcripts were read over and over again by the researcher to get a deep understanding, then, coded and categorized using MAXQDA software. The interview data were analyzed using conventional qualitative content analysis method (Hsieh and Shannon, 2005). Data analysis involved condensing, coding, categorizing, abstracting and extracting themes.

2.5 Trustworthiness

Data trustworthiness was determined by the following measures: Researcher credibility, long-term engagement and continuous observation, research integration, circular or bilateral data collection and analysis, member check and data saturation are some of the methods used in this validation. Also the researcher used the method of maximum variance of sampling and clarify coding and bracketing.

2.6 Results

Demographic characteristics of the participants are presented in supplementary 1. Data analysis led to the emergence of two main themes of causes of and solutions for the dominance of medical journalism and seven categories including "individual factors", "organizational factors", "socioeconomic factors", "the different nature of medicine and public health", "empowerment of stakeholders through capacity development", "organizational change" and "mutual communication and culture change" (Table 1).

It was also highlighted by participants interlink between the different causes and solutions. So, system thinking and its schematic model of causal loops have been used to better understand the causal model and find the most effective and practical solution from the participants' point of view.

Themes	Categories
Causes of dominance of medical journalism	Individual factors
	Organizational factors
	Socioeconomic factors
	The different nature of medicine and public health
Solutions for reducing dominance of medical journalism	Empowerment of stakeholders through capacity development
	Organizational change
	Mutual communication and culture change

Table 1.
Classification of theme and categories

3. The causal loops of the current pattern and the emergent pattern

The analysis of the data retrieved from the interviews showed that multiple factors play a role in the dominance of medical journalism over health journalism. These factors were classified into four groups, including individual factors, organizational factors, socioeconomic factors and the different nature of medicine and public health. Meanwhile, the investigations showed that these causes are often either the cause of another factor or are produced by other factors, thus creating causal loops, as shown in Figure 1. The data analysis also helped identify several loops in the system. For example, weaknesses in communication between the health and media sectors led to the poor performance of health journalists in publishing news; the poorer was the performance of the journalists, the more non-specialized became the performance of the media, resulting in the reduced coverage of health news. In other words, the general observed pattern, i.e. the dominance of medical journalism, is a result of the interaction of a large network of factors rather than a few isolated factors.

It should be noted that the identified causes or determinants of the current pattern of dominance of medical journalism had different relative weights or values for the interviewees as they were discussed with different frequencies during the interviews. Figure 1 presents these weights through shapes showing the different types of factors, and the bigger is the size of each shape, the more frequently has the factor been mentioned during the interviews. The following sections will explain this issue in detail.

3.1 Individual factors: the limited competencies of the stakeholders

Most participants believed that individual factors or stakeholders' characteristics play an important role in the low presentation of health-related news in the media. These factors included the limited knowledge of health officers and managers regarding how the media works and its role in public health, their inadequate skills of working with the media, the limited knowledge of journalists, especially health journalists, about the structure of the health system and the importance and priority of prevention, health protection and promotion compared to treatment and rehabilitation. According to the interviewees, this lack of knowledge leads to inappropriate attitudes and performance, which consequently leads to the less media coverage of public health-related content. Some participants argued that, despite the occasional willingness shown by the media for covering health-related news, public health specialists and the relevant associations act very passively, thereby losing such opportunities. A main reason might be the weak competencies of individual public health

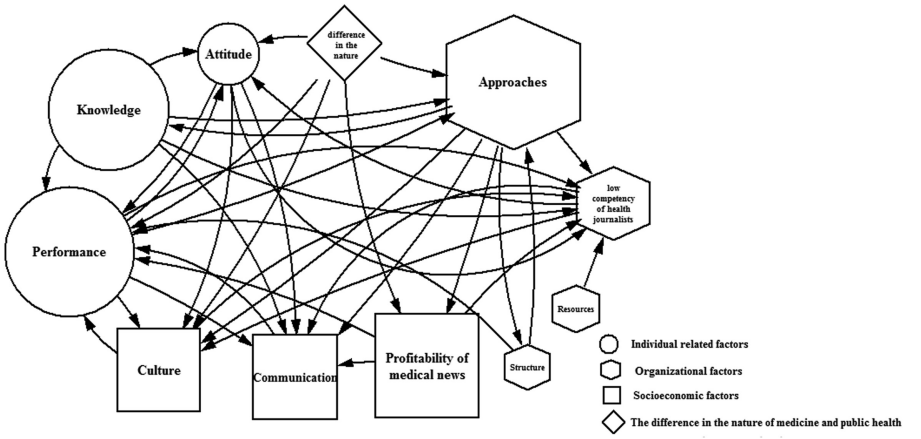

Figure 1.
Causal loops of current pattern

experts to seize such opportunities. In addition, as also observed by the researchers, most participants stated that health journalists have educational backgrounds unrelated to health.

3.2 Organizational factors: medical approach

According to the interviewees, organizational factors such as "the dominance of the medical approach to health at the Ministry of Health and in the media", "weak organizational structure", "limited resources", and "low competency of health journalists" were among the key organizational factors leading to the dominance of medical journalism and consequently medical news. The most frequently discussed organizational factor was the dominance of the medical approach both in the health and media sectors, which prioritizes treatment to prevention and protection in different aspects of the organization, such as funding. The participants argued that the media determines the priorities for media coverage according to the priorities of the health system. Some participants explained that the vast and powerful organizational structure of clinical associations and organizations and their lobbying power contribute to the ministry's focus on treatment. For instance, one of the participants said:

> Medical news is way ahead, because the Ministry itself is more interested in treatment, and then there is the Medical Council ... and also the private sector, which ... has many custodians; there are the associations, and they involve a wide spectrum of organizations. We cannot compare the public health structure with that; public health is more restricted than the medical domain (Public relations staff, male).

Several participants argued that the media is willing to obtain even public health news from physicians rather than public health experts. They also argued that public relations officers' performance in the Ministry is weak when it comes to nonmedical issues.

According to the participants, limited resources, including human and nonhuman resources, also affect the coverage of health news. They explained that the media, especially when faced with financial limitations, prefers to be linked to those who can bring in revenue. As treatment-related news are usually more profitable than prevention-related news, the coverage of treatment-related news is enhanced. In addition, it was frequently argued that there is a shortage of competent health journalists, as most of the so-called health journalists employed by the media, such as news agencies, lack suitable educational background and competencies.

3.3 Socioeconomic factors: attractiveness of medical news and communication gap

The interviewees repeatedly asserted the role of social factors such as "the profitability of medical news", "weak and ineffective communication among stakeholders" and "the preference of treatment over prevention in the public culture" as causes for the low coverage of health-related news. Some participants believed that a large portion of health-related news depends on the capitalistic system. Therefore, since the dissemination of diagnosis and treatment news promotes the sales of products and services and is more profitable, it is more attractive for the media. In contrast, collaboration with health specialists, unlike physicians, has no personal or organizational gain for the media in which to invest. This issue leads to less communication with the public health sector.

Weak communication among key stakeholders, especially between the media and the health sector, is another important social factor affecting the quantity and quality of media coverage of public health news. As already noted, the less profitability of public health news decreases the media's motivation to communicate with public health experts. According to some of the participants, public health specialists and managers refrain from communicating with the media or the public due to certain individual and organizational factors, such as budget limitations and poor competency.

Some participants argued that the media is also affected by the public culture. A culture that favors treatment over prevention directs the media toward further attention to treatment

for increasing its audience and offering people what they want. They argued that when a society does not seriously demand knowledge on health protection, prevention and promotion, the media will not cover health content as they should.

3.4 The difference in the nature of medicine and public health

According to some participants, the difference in the nature of medicine and public health is another key factor that might explain why medical news are more attractive both for the media and the public audience. For example, the visible, tangible and measurable effects of medical treatment and its emergencies and greater attractiveness for the media compared to health protection, prevention or promotion news, which have long-term effects and less perceived importance or emergency, should be taken into account in understanding why medical journalism wins over public health journalism.

4. Multiple, multi-level coordinated interventions

The participants recommended multiple interventions to reorient the dominance of news coverage by disease to health and well-being and addressed the dominance of medical journalism at three levels, including individual, organizational and population levels. The factors were classified into three main groups, including empowerment of stakeholders through capacity development, mutual communication and culture change and organizational change (Figure 2). The majority of the participants argued that interventions should be implemented for all the components and on all levels of the news coverage system. Another key result of the data analysis aside from identifying the need for multi-level interventions was highlighting the link between the interventions recommended by the participants. The participants did not only recommend a variety of interventions but also described the process by which these interventions can contribute to overcoming the low media coverage of public health news. More details will be provided in the following section.

4.1 Empowerment of stakeholders through capacity development

Many participants discussed a range of competencies that had to be developed or strengthened in different stakeholders. They also discussed different strategies for capacity development and the mechanisms by which these interventions can improve the media coverage of health news. For example, they argued that the personal competencies and capacities of all stakeholders must be developed or strengthened through "stakeholder

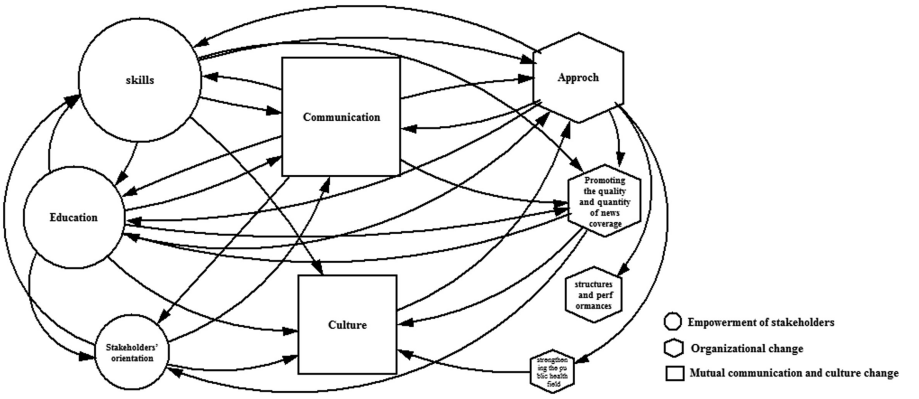

Figure 2.
Multiple, multi-level coordinated recommended intervention

education" to change "the key stakeholders' orientation from treatment to prevention". One participant stated:

> A major part of this solution can be accomplished through education –an evolution in education. Those who offer services must be well informed (Public relations staff, male).

Other participants stated:

> We need a tough evolution among the media managers... Everyone active in journalism must understand that we can prevent heavy costs if we spend money on raising awareness, building a culture of self-care and addressing health-related topics. This requires a national resolution involving everyone (Public relations staff, male).

The majority of the participants attributed top priority to educating media chief editors, administrators and journalists about health issues and the importance and priority of prevention and health protection and promotion strategies compared to treatment and rehabilitation as these stakeholders determine the priority of the news. In describing the role of the attitude of those with power, one participant said:

> Who can voice his ideas? It's either the media administrator, policy-makers, or those in charge. If their attitude is [prevention and health], it will definitely work. (Public relations staff, female).

The participants also argued that health sectors and health journalists need different types of education. Regarding the required capacities and capacity building strategies for journalists, many of the participants suggested that health journalists should be trained to develop and strengthen their capacities, including knowledge about public health, key health promotion strategies, key public health challenges, their determinants and solutions as well as news writing and presenting skills. They believed that such trainings can help increase public health media coverage and then also change public demand in the long term.

They argued that health specialists who intend to work with the media must have competencies such as knowledge about the media, its different types and capacities, rules and red lines, structural–organizational regulations, criteria for news writing and best strategies for working or interacting with the media. They believed that this knowledge can help them have a more effective and productive collaboration with the media and empower them to use the media as a tool for health education, building a better culture, forming health habits and increasing the public demand for health promotion knowledge. According to them, this demand can further prioritize public health in the media.

4.2 Organizational change

The data analysis identified a range of recommended organizational solutions, such as "changing organizational approaches", "changing organizational structures and performances", "strengthening the public health field", and "promoting the quality and quantity of news coverage". The participants insisted on changes in the approaches of the health sector as the most important interventions for addressing the dominance of medical journalism and the enhancement of public health news coverage. They explained that if the dominant approach of the Ministry of Health was changed to prevention, health protection and promotion, then public health would also become the emphasis of the media and a top priority of the agenda of the health section editors of news agencies. This matter would lead to greater health journalism and more coverage of public health news. The participants also suggested that the government can monitor the news released by different media, provide timely feedback based on their quality and support high-quality media that broadcast prevention and health promotion news by paying subsidies and health education fees to them and thus support any efforts to become health-promoting rather than disease-promoting.

Some of the participants noted that although the Ministry of Health has attempted to implement strategies for prioritizing prevention and health protection, these changes would be fruitful only if the existing infrastructure got improved. For example, it is necessary to have a purposeful mechanism for creating greater public demand for public health information and awareness. Some of the participants believed that "increasing or expanding the health sector structures", whether in the state or private sector or NGOs, should also be seriously considered.

Many of the interviewees emphasized the importance of improving the public relations performance of the Ministry of Health and research and academic centers. They suggested effective measures such as "recruiting specialized media consultants", which can help enhance health news coverage and the effective and timely publication of research findings in scientific journals related to prevention and health in the media. Increasing human and financial resources for prevention were also believed to attract the attention of the media. Some participants argued that the recruitment of consultants with health and media knowledge is helpful. The other recommended organizational intervention was the recruitment of journalists with university degrees in the public health domain or at least journalists who have passed health-related courses.

The participants also stated that health journalists' and the media's economic and political independence plays a key role in improving their view of health, choice of priorities and performance and also contribute to the improvement of public health experts' communication and collaboration with the media. The other key solutions proposed by the participants included recruiting health experts in the media, which can help form a network of other health and prevention professionals and create a specialized public health team in news agencies.

4.3 Mutual communication and culture change

Many of the interviewees suggested that filling the communication gap between different stakeholders, especially public health and media stakeholders, and changing the medicine-oriented culture of the society are key population-level interventions to tackle the dominance of medical journalism. Some interviewees believed that communication can begin from either side and at any level, such as at the Ministry of Health, the health deputies of universities of medical sciences, public relations departments of the health sector and public health experts, or can occur simultaneously at multiple levels.

Nonetheless, they argued that interactions at higher levels, e.g. senior health policymakers, can lead to better results. Ultimately, the participants argued that no matter how this communication is formed, it must be a purposeful, constructive and win-win relationship based on mutual trust and enriched by a deep mutual understanding of different organizational goals, structures and functions.

Regarding communication strategies, some of the participants suggested that academic public health associations and NGOs can invite health journalists to their events and thus familiarize them with the current challenges and advancements in public health as well as their activities and role in public health. Some stakeholders argued that health journalists must actively seek to establish communication with public health experts in different fields. From their perspective, such actions enabled them to produce high-quality but also attractive public health content for a public audience.

According to some stakeholders, significant attention should be paid to modifying the treatment-oriented public culture as it does not just improve the quality and quantity of health and prevention news coverage but also raises the priority of prevention both in the media and the health system.

Some stakeholders argued that public demand is based on people's knowledge and awareness. Therefore, the more is people's health-related knowledge enhanced and the

more familiar with and sensitive toward the causes of diseases they become, the more likely is it for their attitude and demands and consequently culture to change in favor of health promotion. They therefore become more inclined toward acquiring prevention knowledge, demand more public health news from the media, etc., and the media will thus become more enthusiastic about covering public health news. One participant stated:

> People are interested in these topics [treatment]. Unfortunately, we have not fully explained what behavior leads to this issue so asfor people to understand that self-care or prevention measures can promote health (Public relations staff, male).

The participants also argued that media-based education and awareness-raising measures can be successful public health strategies for culture change. Some of the participants suggested that the media can help with culture modification by the repetition and re-publication of public health topics and indirect education through stories, arts, movies and reports. They noted that nonspecialized or public media will be more successful in this area because they have a wider audience and thereby a capacity to transmit the message of health to a larger population. According to few of the participants, people sometimes tend to better accept news and topics if they come from health-related NGOs. It is therefore helpful to involve NGOs as well for the enhancement of a prevention culture.

5. Discussion

As described in the Ottawa charter, there are five key strategies for health promotion, including developing public health policies, creating supportive environment, strengthening community actions, developing individual skills and reorienting health services (WHO, 1986).

Creating health-promoting media (HPM) plays an important role in the success of health promotion strategies (Bou-Karroum *et al.*, 2017). The media can facilitate the creation of health policies and the establishment of a supportive environment, strengthen community action and re-orient health services by raising information, shape attitudes and beliefs, change behaviors and influence the context of health promotion actions (Postma and Ramon, 2016). Success in any of these five key strategies seems impossible or limited without having HPM instead of disease-oriented media. The media has a significant power in developing prevention and health-promoting attitudes, behaviors and skills (Lovejoy *et al.*, 2015) among all people regardless of their expertise or social roles. Improving the media health coverage and directing its focus to prevention and promotion are therefore vital (Howell and Ingham, 2001) for public health interests.

Although health-promoting settings have been researched significantly in cities, schools (Yazdi-feyzabadi *et al.*, 2017), hospitals (Johnson and Baum, 2001) and workplaces (Motalebi *et al.*, 2018), the media as a key setting has been relatively ignored. One potential reason might be the complexity of working with the media. Achieving success in creating HPM requires a deep understanding of the complexity of the media and the identification of strategies for guiding it toward health-promoting rather than disease-promoting news coverage.

Media coverage is known to be shaped by various factors (Leask *et al.*, 2010). These factors include available resources (space, time, knowledge), competition for space and audience, editor's choices, commercialism, ease of obtaining news and public interest (Hodgetts *et al.*, 2008). It seems that these factors have often worked in favor of medical news and helped their dominance over public health news. To tackle this pattern, a deep understanding of the determinants and barriers of public health news coverage is mandatory.

Media coverage is a complex process made up of multiple components and the interaction between the attitudes of professionals, the economy, politics, culture and social factors (Larsson *et al.*, 2003). This study contributes to the better understanding of the complexity of

the causes, processes and factors leading to this pattern by trying to provide a comprehensive understanding by exploring the perspectives of both the media and health sector.

This study argues that, beyond the factors and actors already identified as influential in shaping the media's coverage of different topics, the interaction, connection and even interdependencies of these factors also matter. The link between these factors shows that they work together in a complex intertwined network. As demonstrated in the findings, the different causes of the dominance of medical journalism are linked together in a network-type structure. In other words, one of the key contributions of this study was providing a deep insight into the current pattern and a network of causes for the dominance of medical journalists rather than merely offering a set of unlinked variables; as such, the results can help generate solutions. The network structure of these causes highlights the multilevel interdependencies at individual, organizational and social levels in both the media and health sectors. That is, changes in any part of this network can lead to changes in the other parts. This reciprocating effect exists in intersectoral interactions (Keshavarz *et al.*, 2010) in other social systems as well.

In such circumstances of dealing with a complex multifactorial problem, the main challenge is to identify the most important factors or causes, i.e. the best part of the network, whose alteration leads to the greatest change in the system (Keshavarz Mohammadi, 2019). The causal loop method is a systems thinking tool (Figure 1) that offers a useful visionary tool to identify the leverage points of the system and find effective interventions. Among the several strategies that can help improve the coverage of health issues, empowerment and development of personal skills in the stakeholders, especially journalists, are expected to have the greatest effect on the emergence of health-promoting behaviors in the media.

Journalists are regarded as the gatekeepers of news (Shoemaker, 2020); in addition, health service editors, who ultimately decide which news should be published and which should not, are key agents who shape the system's behavior. Therefore, journalists' knowledge of the nonmedical determinants of health and familiarity with the health sector and public health experts and their activities can have a major role in shifting the overall outcome of the system toward public health. The prerequisite for this knowledge is the formation of an ongoing, effective and dynamic relationship between health journalists and various public health experts and organizations (Hodgetts *et al.*, 2008). The greater is the interaction between these two sectors, the more influential will be their role in empowering each other.

Furthermore, the media is more interested in interacting with clinicians as it is more profitable than interacting with public health. The responsibility of dealing with this challenge lies more with the health sector, (Wallack, 1990; Seale, 2003) in particular, the policymakers of this sector (Wallack, 1990). Health policymakers can use the capacities they have in this field and provide incentives and support for greater communication between the public health sector and the media. As shown by Figure 2, the relationship between health and media professionals not only leads to the empowerment of both sides and increases health news coverage but also results in increased public demand, which is a major influential factor for policy change.

6. Conclusion

This study sheds light on the complexity of developing health-promoting media by reporting on a case study from Iran. It highlights the need for systems thinking approach to understand the networked causes of the current pattern, which is the dominance of medical journalism, and also advocates for the need to observe and understand the dynamic interaction of these factors, thus calling for systems thinking–informed practice. This study identifies some potential strategies and clarifies the process under which the intended outcome is expected to

be achieved, which again demonstrates the link between different actions and their influence on each other. The findings suggest that empowering journalists and developing their personal skills and facilitating communication between the media and the health sector are the most helpful intervention strategies. Nonetheless, as this study is among the pioneer studies in this field, it should be considered a first step rather than the end. Future similar research in different socio-economic contexts can provide a more comprehensive perspective regarding the causes of the situation and its improvement strategies.

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Appendix

Supplementary data

The supplementary material is available online for this article.

Corresponding author

Nastaran Keshavarz Mohammadi can be contacted at: n_keshavars@yahoo.com

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Putting assemblage to work to explore pedagogical practices in health education in Aotearoa New Zealand

Rachael Dixon
University of Canterbury, Christchurch, New Zealand
Gillian Abel
University of Otago Christchurch, Christchurch, New Zealand, and
Lisette Burrows
University of Waikato, Hamilton, New Zealand

Abstract

Purpose – In Aotearoa New Zealand, Health Education is socio-critical in orientation and is offered as a subject that can offer credits towards the national secondary school qualification. The purpose of this paper is to explore the learning experiences of people who studied Health Education to the final level of secondary schooling in Aotearoa New Zealand. The authors focus specifically on how the subject is taught; or the pedagogical practices that are "put to work" in the Health Education learning environment.

Design/methodology/approach – Using in-depth interviews as the authors' method of data production, they experiment with a post-qualitative approach to analysis while traversing the theoretical terrain of new materialism. In doing so, they explicate the non-human and human elements that are arranged in a pedagogical assemblage – and explore what these elements can do.

Findings – The authors found that an array of pedagogical practices were put to work in the senior secondary school Health Education classroom: Student-centred approaches, a non-judgemental and energetic tone to teaching, deployment of human and non-human resources, and students connecting with the community. The authors argue that these practices open up possibilities for a critical Health Education.

Practical implications – This research addresses an empirical gap in the literature by focusing on Health Education in the senior secondary levels of schooling. The findings in this paper may provide readers who are Health Education teachers with ideas that could be of material use to them in their teaching practice. In terms of implications for researchers, the authors demonstrate how putting "new" theory and methodological approaches to work in the area of school-based Health Education can produce novel ways of thinking about the subject and what it can do.

Originality/value – The shifting nature of the pedagogical assemblage can ignite new ways of thinking about teaching practice in the Health Education classroom and the capacities that result for learners. In combination with a post-qualitative approach to analysis, the paper provides a novel approach to exploring Health Education.

Keywords New materialism, Post-qualitative, Assemblage pedagogy, Health education

Paper type Research paper

Introduction

School-based Health Education in Aotearoa New Zealand

In Aotearoa New Zealand, Health Education is one of three subjects in the Health and Physical Education learning area (HPE) of *The New Zealand Curriculum* (Ministry of Education, 2007). As is the case for all learning areas in the national curriculum, HPE is mandated until the end of year 10 (i.e. ten years of formal schooling). After year 10, Health Education becomes an optional subject (as does Physical Education).For those students who

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opt to take the subject at senior secondary level, Health Education makes a contribution to the National Certificate of Educational Achievement (NCEA), a standards-based assessment system that is assessed at each of the final three years of schooling (years 11–13) and has been in existence since 2002 [1]. The research upon which this paper is based sought to explore the learning experiences of people who had studied Health Education to year 13 in Aotearoa New Zealand.

Scholars in the field have long advocated for a critical approach to Health Education (for example Culpan and Bruce, 2007; Fitzpatrick, 2014; Leahy *et al.*, 2016; Leahy and Simovska, 2017)). Criticality in Health Education originates from critical theory and allows students opportunities to think critically to challenge assumptions, inequalities, social injustices, and hegemonic relationships; and become empowered to take social action (Culpan and Bruce, 2007). A socio-critical approach is a feature of Health Education in New Zealand (Fitzpatrick and Burrows, 2017) and in the recently developed Australian Curriculum for Health and Physical Education (Macdonald, 2014). However, the extent to which the socio-critical intent of these curricula is enacted in teachers' practice is unclear, in context of the complex socio-political-cultural environments which shape the way in which Health Education is taught. Moreover, the critical pedagogy that is needed by teachers to meaningfully enact a critical approach to Health Education can be challenging for teachers and for students (Fitzpatrick and Allen, 2019; Leahy *et al.*, 2016). Indeed, Fitzpatrick and Allen (2019) assert that being a critical teacher in Health Education is messy and challenging work. It is a task that involves traversing inconsistencies and contradictions for teachers and learners, and necessitates a willingness to relinquish notions of total teacher control over the direction that learning is to take. Fitzpatrick and Allen (2019) surmise that critical practices in Health Education may result from the subject being conceived as *about* health rather than *for* health, or as a discipline of study; which is certainly how it is positioned when it is taught in New Zealand at the senior secondary level as part of the NCEA.

Defining "pedagogy"

"Pedagogy" is a term widely used in education, but is often used without being defined – its meaning often taken for granted (Leahy *et al.*, 2016). *The New Zealand Curriculum* (Ministry of Education, 2007) defines pedagogy simply as "teaching approaches" (p. 34). Pedagogy is a term also used in Health Education and health promotion more broadly. In these contexts, public pedagogies – learning experiences influenced by culture outside the confines of the classroom (Goodyear *et al.*, 2018) – are commonplace. In schooling terms, a socio-constructivist approach to teaching in Health Education has long been advocated a preferred pedagogical approach within the subject (Ministry of Education, 2007; OECD, 2010). In this approach, learning is "shaped by the context in which it is *situated* and is *actively constructed* through *social negotiation* with others" (OECD, 2010, p. 3, emphasis in original). From a new materialist perspective, however, socio-constructivism is inadequate as it overlooks the role of the material. In framing this paper within a new materialist body of knowledge, then, we conceive a pedagogical approach to Health Education as "socio-material". In line with assemblage and new materialist thought which theoretically underpin our paper (as we explain below), for the purposes of this paper we define pedagogy as "the use of, and participation by, a dynamic combination of human and non-human resources to bring about learning in Health Education".

Theoretical tools

The value of experimenting with "new" theory and methodological approaches in health education

Research in the area of school-based Health Education has often tended towards critique without offering possibilities for a way forward; to enable creative reimagining of Health

Education and what it can *do*. The nature of critique to leave Health Education in a precarious position was highlighted by Allen (2018) in the context of sexuality education when she asked "how far has *critiquing* the inadequacies of sexuality education actually delivered us?" (p. 3, emphasis in original). Fernández-Balboa (2017) adds to this when he argues that school-based Health Education continues to be dominated by un-critical practice in part due to:

> The incapacity of the critical HPE scholarship, carried out mostly in academic contexts, to translate and interpenetrate the daily realities of schools, and, similarly, to connect with the political, economic and institutional realities of key stakeholders in policy spaces (p. 659).

Following Allen (2018) a question that informed us as we set about researching senior secondary Health Education in Aotearoa was *so, how far has critiquing Health Education curricula and teaching and learning practices got us?* This question led us to search for "new" tools to put to work in our research so we could enrich our inquiry, have the chance to ask different questions of our data and of Health Education, and ultimately enable a different way of thinking about what pedagogical practice in Health Education can *do*. This is congruent with the assertion by Leahy *et al.* (2020) that exists a need in the field of Health Education research to engage in "what might be referred to as to as theoretical polyamory as a way to consider new ways of, and frames for, thinking in an attempt to get us outside of our usual orbits and habits of thought in health education" (p. 3).

New materialism and pedagogy as assemblage

New materialism can be understood as a way of understanding that the world involves "the interaction and entanglement of heterogeneously combined elements and forces" (Hein and Søndergaard, 2020, p. 56). Further, attention is paid not only to the discursive (social) world, but to ways in which the material shapes and (re)produces the worlds in which we orbit- and what this consequently *does*. Assemblage (Deleuze and Guattari, 1987) is a new materialist theoretical tool that has been taken up in sociological research (Alldred and Fox, 2019; Fox and Bale, 2017; Fox and Klein, 2019) as well as in Health Education contexts (Leahy, 2012, 2014; Malins and Kent, 2020). Assemblages are comprised of a dynamic arrangement of non-human and human bodies assembled by their capacity to affect and be affected by other bodies (Fox and Bale, 2017). In context of the pedagogies of school-based Health Education, examples of these "bodies" include actions and interactions of the teacher and learners (and learners with each other), material resources used in the subject, people and things other than the teacher and learner who enter the pedagogical space, curriculum, assessment, culture and the socio-political environment within which the subject is taught.

We hope that utilising the assemblage enables us to not only illuminate a wide range of human and non-human relations at play in Health Education pedagogical practice but also reveal insights into what affects and capacities are produced as a result of the assembled relations. Assemblages are "provisional, emergent and transformable" (Healy and Mulcahy, 2020, p. 4). This means that an analytical strength of this approach is that insights can be made into the relational and shifting nature of the Health Education experience in a way that encourages movement forward in future teaching practice and research, rather than implying and representing fixed understandings which simply re-inscribe past or current understandings about pedagogical practice in Health Education. A limitation of how we apply the assemblage analytic is that we sacrifice depth for breadth by illuminating a wide range of relations at play in the pedagogical assemblage. However, what this approach can do is provide a springboard from which others can explore the elements of interest to them in their own contexts.

Pedagogies employed in Health Education, then, comprise a dynamic arrangement of non-human and human elements which come together, collide and intra-act (Barad, 2007) to interrupt thought and practice, and take off on lines of flight to enter into new assemblages

(Deleuze and Guattari, 1987). The word "dynamic" indicates that the assemblage is constantly on the move. It involves on-going, ever-changing choices as to the ensemble of events, actions, and objects that are needed to (or presumed to) bring about learning. The concept of affect is also critical to understanding how assemblages are produced and iteratively reassembled. As stated above, assemblages are comprised of bodies "assembled by their capacities to affect and be affected" (Fox and Alldred, 2017, p. 27). This means that the pedagogical assemblage is inherently productive – it does something. In assemblages, we can conceive of how pedagogical practices might come into play and play out, how some might be cast aside, and how the practices collide and connect (and how new connections are made). Ultimately, we can begin to understand what they *do* to bring about learning and create overall experiences in Health Education.

Participants and analytical approach

Participants

We used in-depth interviewing to explore the experiences and learning outcomes of senior secondary level Health Education. Ethical approval for the study was gained from the University of Otago Human Ethics Committee. Participants in the study were 25 people from across Aotearoa New Zealand who had studied Health Education to the end of year 13 (the final year of schooling). The majority of participants identified as New Zealand European, with three Māori, one Pasifika, one European, and three identifying as Māori/New Zealand European, with 23 females and two males interviewed [2]. It had been between 0 and 11 years since the participants had completed their final year of schooling. Participants were current university students studying a range of disciplines, or in the workforce – with occupations such as teacher, nurse and working in retail. The primary method of participant recruitment was "word-of-mouth" through the lead author's professional connections. Interviews were between 40 and 90 min, and were audio recorded. The lead author conducted the interviews and transcribed the recordings to create transcripts for analysis.

Analysis

We employed a post-qualitative and post-coding approach to data analysis. Post-qualitative scholars have written extensively about the inadequacies, for them, of coding. For example, coding stifles creativity (St. Pierre *et al.*, 2016) and limits the production of the not-yet-known and makes things stagnate (MacLure, 2013). St. Pierre and Jackson (2014) equate coding with a positivist analytic practice, through which researchers can avoid engaging with theory. Moreover, Mazzei (2014) asserts that coding is, for many researchers, "where analysis begins and ends" (p. 743). Wanting to bring theory to the fore-front of our work led us to the analytical approach that we took.

This post-qualitative approach involved two analytical movements. First, we drew inspiration from Jackson and Mazzei's (2012) "thinking with theory" approach to pose a question of our data relating to our interest in pedagogy as assemblage: *what relations exist in an assemblage of Health Education teaching and learning strategies and what capacities are produced as a result?*

Our second analytical movement was to analyse the findings from our first analytical movement by using theoretical tools offered by the assemblage analytic. We believe this approach to analysis enables our findings to be presented in a way in which is both accessible to a practitioner audience, is theoretically rich, and is productive of new ways of thinking about the pedagogical practices used in Health Education. For this movement, we drew upon the work of Nick Fox and co-researchers who have used a variety of data collection methods (including interviews) to construct and analyse assemblages across sociological phenomena

(for example Alldred and Fox, 2019; Fox and Bale, 2017; Fox and Klein, 2019). We acknowledge that our pedagogical assemblage is an amalgamation of participants' experiences, rather than an assemblage produced by first-hand (in the classroom) observation. Moreover, we acknowledge that no one set of teaching tools or approaches will ever be guaranteed to work for all teachers and learners, in all contexts. According to Mulcahy (2012) "pedagogic practices and affects are entirely dependent on which other practices and affects they form an assemblage with" (p. 22). However, the following is the assemblage that has come about from our analysis of our data. In true assemblage form then, it is a compilation of collective ideas, rather than an account of individuals' experiences in and of Health Education learning. That said however, the analysis that follows uses examples from participants to make a case for the nature of the assemblage and its resulting capacities – what it does, enables, creates; or what becomes, as the pedagogical assemblage is enacted in senior secondary Health Education spaces.

The pedagogical assemblage

Four key elements in the Health Education teaching and learning assemblage arise for us, from our interrogation of interview data with the question *what relations exist in an assemblage of Health Education teaching and learning strategies and what capacities are produced as a result?*

(1) How subjectivities shift in the Health Education classroom

(2) The tone of the teaching

(3) Deployment of human and non-human resources

(4) Connections to the community.

Using the theoretical tools associated with the assemblage as explained above, we turn to our explanation and analysis of the four elements, as supported by comments from participants, (using pseudonyms) and others' research findings.

Shifting subjectivities: teacher-student-learner-teacher

Participants having autonomy over aspects of their learning as well as being given the space to make sense of health-related issues and information was prominent throughout the interviews. For example, Courtney commented on the importance in Health Education of a teacher "*providing a starting point for people to look into things, to learn, or decide for themselves, maybe be empowered to make changes.*" Daniel reflected that the ability to choose contexts for learning was motivating for him:

> We got to choose . . . I feel that it was good having some agency over what I was looking at and stuff. I felt like it was less being shown a bit of paper and having to read it, and more like I can go out and find this information myself and see what I enjoy.

Participants viewed themselves as being more actively involved in the learning in Health Education than in other subjects they had studied; their experience of which tended to be more teacher-directed. As a result, their learning was more passive and less interesting in other subjects in comparison with Health Education. For example, Rikki commented:

> With health you enjoy actually doing the research and analysing something, and a lot of it can be freedom of choice and you can pick what interests you as opposed to you are reading this book or analysing this film (in English class).

Susannah discussed students being equal participants in Health Education learning:

> (At high school) you are more or less dictated to by the teacher, whereas that style wasn't what was happening in health . . . They were there guiding our learning, but yeah it was always as though we were equal participants in what was being talked about.

The pedagogical approach that was put to work in Health Education, then, speaks to a less hierarchical approach (Malins and Kent, 2020), and more equal and active participation in knowledge construction, when compared with their experiences in other subjects. Pringle and Pringle (2012) assert that a critical Health Education is one in which learners are taught how to think (rather than what to think), as well as offering them the skills to critically engage with the uncertainties of our world. It follows, then, that a critical pedagogue needs to relinquish a more traditional notion of teacher authority in order to pose questions and spark critical discussion (Fitzpatrick and Allen, 2019; Malins and Kent, 2020), rather than solely provide answers.

The quotations above indicate that participants were indeed given a starting point for an experience of a critical Health Education. The predominant insight for us here, however, is the shifting subjectivities – subject positions – that are enabled in the Health Education pedagogical assemblage. The boundaries around the teacher/learner role are blurred in the assemblage, particularly when compared with the experiences in other subjects that participants studied in their senior secondary years. These shifting subjectivities are affective flows through the assemblage. They create the capacity for learners to feel valued for their contributions, be motivated to engage more fully in the learning, and enable them to feel as though they are empowered and active members of the learning community. Primdahl *et al.* (2018) discuss the importance of the teacher (in a critical Health Education) to "shift from gatekeeper of knowledge to a facilitator of processes of knowing" (p. 10) which is evident in the findings above. Through engaging in conversation, undertaking research, and having the opportunity to question taken-for-granted knowledge (rather than being passive recipients of predetermined information) the learning in Health Education is meaningful, personalised and productive. Moreover, from a new materialist standpoint, the subject position of non-human elements of the pedagogical assemblage has the potential to shift to one that has a more active, agentic (Bennett, 2010), and affective role in the learning process. As entangled components in the assemblage, resources might take on the capacity to have a life of their own, and lead learning in unanticipated directions, or create lines of flight (Deleuze and Guattari, 1987) that may ultimately lead to their entanglement within new assemblages.

However, being actively involved in their learning was less evident when participants recollected their junior secondary Health Education experiences. This is not to say that it is not feasible, or indeed desirable, for learning at the junior secondary level of schooling to be more student-centred, but the evidence from participants indicated that a more didactic style was their experience of Health Education in the junior secondary years. For example, the following quotation from Rebecca: "*I didn't really enjoy year 9 and 10 . . . I found it boring to be honest. It wasn't much interaction, it was just more sit down and let the teacher talk.*" This comment resonates with traditional approaches to teaching Health Education such as didactic instruction (Malins and Kent, 2020) and moralistic health talks (Jensen, 1997; Leahy *et al.*, 2016) that have been found to persist in contemporary Health Education pedagogy. Or, to use the words of Barwood *et al.* (2016, p. 23), the "shut up, sit down and do a worksheet" approach. Thus, students who do not study the subject past year 10 may be left with less-than-ideal impressions of Health Education. For these learners, there is no shift in subjectivities that takes place. Here, a traditional teaching approach firmly entrenches students into their subject position of learner, teacher into that of knower, and non-human resources (such as worksheets) are used routinely rather than in novel ways that produce new ways of learning in Health Education. Affective responses to the pedagogical practices in Health Education may thus be better described as stagnant than productive, with the

resulting capacities being that year 10 is the "end of the line' for most learners' involvement with Health Education. Given this observation, the arrangement of pedagogical practices in junior secondary Health Education could be a future avenue for research, in order to ascertain the extent to which the pedagogical assemblages at play in current learning environments align with the reflections from participants (and others' research) above.

The tone of the teaching

Participants made extensive comments about the overall tone of the teaching and the safety considerations for the learning environment in Health Education. In doing so, they particularly drew upon the ideas of respect and sensitivity, thus speaking to the importance of these ideas as affective flows within the pedagogical assemblage – respect and sensitivity being at the heart of, and entangled within, Health Education learning. Primarily, comments were made about the teacher setting the tone for members of the class to follow in a way which encouraged all members of the class to be respectful in their interactions with others as they learned. For example, as Hine expressed:

> I think the main thing is to create a safe environment where everyone feels comfortable talking about and listening to other people's opinions. I think the most important thing is the teacher and the atmosphere that they set.

Connected to the establishment of a supportive and safe learning environment, a number of participants' comments relate to the importance of supportive and respectful interaction between members of the Health Education learning environment, including teacher-student, and student-student. Participants recounted their memories of a teaching approach that was non-biased, respectful, and non-judgemental. This had the resulting capacities of them feeling safe to share their opinions and questions, and more closely connecting with the topic under consideration, thus enhancing the learning potential of the pedagogical practice. For example, Helen asserted the importance of the teacher being "*non-judgemental and relatable to everyone and doesn't make you feel like your ideas are wrong and silly . . . just builds up your confidence and makes the lessons interesting as well, and relatable.*" Participants discussed that because of the supportive, non-judgmental tone that the teacher had set for the learning environment, students were better equipped to be respectful to others in their discussions and interactions – demonstrating a flow on effect for them. For example, Katie summed this up by stating:

> I think we were made to feel as if we were adults and that we were respected for our opinions, or our views, or our experiences. I always remember thinking it was a really fun and supportive environment, and it was a good balance of humour and seriousness on the teacher, and then I think that set the tone for the lessons.

Participants also discussed the importance of the teacher being open to sharing some of the self, which is a feature of a critical approach to Health Education (Fitzpatrick, 2014). Rebecca discussed her teacher's use of personal story telling in relation to her resilience after suffering a major injury: "*That was probably my most memorable thing in my health, seeing a teacher putting her own experience into it and showing us that we can bounce back.*" For Rebecca, her teacher's story indicates a line of flight (Deleuze and Guattari, 1987) that opened up the possibility for her to more deeply connect with her teacher, better understand how the learning concept of resilience plays out in real-life, and feel empowered to be resilient in the face of her own life changes. Jensen (1997) identifies teacher role-modelling as an aspect of moralistic Health Education – in other words, he views role-modelling in non-productive or destructive terms. Jensen uses the examples of "smoking, alcohol and nutrition" (1997, p. 420), which implies a biomedical or physical focus for role-modelling, with an expected behavioural outcome of learning (to not smoke, etc.). In contrast, the participants in our study viewed role-modelling more holistically, in productive terms, and possibly as a line of flight that could

potentially branch out (Deleuze and Guattari, 1987) to create a different experience of Health Education, one in which personal connections might be nurtured and prioritised.

Connected to the overall tone of teaching and learning in Health Education was an energetic, interactive, and eclectic approach to teaching and learning activities, as advocated for Health Education by a wide range of authors both internationally and in Aotearoa (Cahill, 2018; Ministry of Education, 2007; OECD, 2010). This resonates with the "playfulness" element of critical Health Education teaching practice (Fitzpatrick and Allen, 2019). A high-energy, mixed-up approach was sometimes contrasted with other subjects that were studied in year 13, for example: Rebecca said: "*(English) was just sitting down, reading, looking at the board and writing down notes. But I was so excited to go to health because I was going to be moving around, going to be talking to everyone."* Participants consistently recalled interaction as central to their Health Education experience. For example, Daniel recalled that "*it was definitely more lively and stuff. And it felt like it was more debates and conversations than just sitting there and listening for an hour. So it was definitely more interactive. It felt more fun and it kind of felt like a place where your opinions mattered*".

Finally, the use of a wide range of learning activities was encapsulated by the following comment from Rikki: *"She just mixed it up, she had continuums and postboxes, and then there'd be short clips and all that – you know, catered for visual, kinaesthetic and audio learners in different ways."* Niccolini (2016) discusses the "animate affects" that arise when learning is exciting, learning is connected to young people's passions, and when students are involved in "bouncing stories and ideas off each other, sharing in excitement, and speeding up the intensities of the classroom" (p. 242), which is reflected in the participants' comments above. The interactive, high-energy approach to learning in Health Education for our participants also brings to light the role of embodiment. This is through the movement of learners' and teachers' bodies being an element of, and an affective flow through, the pedagogical assemblage. The ways in which bodies are involved in Health Education learning (as described earlier) contrast with what might otherwise come to mind about the role and positioning of the (neoliberal) body in Health Education.

The use of fear-based discourses in Health Education remains persistent (Leahy, 2012; Malins and Kent, 2020; Wright *et al.*, 2018). The participants in our study had not experienced a fear-based approach in their NCEA years of Health Education. However, participants recalled the fear-based approach routinely being put to work in the junior secondary years of Health Education: Ben and Amy (interviewed in a pair) discussed the use of a fear-based approach in junior secondary Health Education, and how this would likely discourage students from continuing to study the subject at senior secondary level:

> Ben: It's hard to not remember the fear-based approach early, when you are in the junior . . . year 9, where they just say this what an STI [3] is, this is a picture of it, and you are just like "what is going on . . . this is the worst time . . . I don't want to be here". Just unconstructive ways to show you, eh. . .. For me, it's got negative connotations . . . fear-based approach doesn't work, that type of paradigm doesn't work, so I suppose it's like, why is it still being used? . . .
>
> Amy: I think for some people it would put them off health . . . they are not really going want to pursue Health Education if they've been put off it.

These comments reinforce the importance of a strengths-based approach to Health Education in junior secondary schooling, for which Leahy *et al.* (2016) stress the importance of *how* the subject is taught as much as *what* is taught. The participants' comments indicate that their experience of Health Education in the senior secondary levels was more consistent with a strengths-based approach. For example, through the on-going use of student-centred approaches and drawing on (and being able to make sense of and critique) resources from a wide range of sources (Leahy *et al.*, 2016). Ben's reference to the use of sexually transmissible

infection photos in junior Health Education, on the other hand, indicates the persistence of what Leahy (2014) termed "disgusting pedagogies". Leahy (2012, 2014) stresses that such a pedagogical approach is guilt-inducing and ineffective. In assemblage terms, capacities of Health Education for learning are shut down or diminished (Malins and Kent, 2020).

Human and non-human resources

Participants' comments indicated the need to draw upon a wide range of resources when teaching Health Education – both human and material. With the latter, a point of entry into the pedagogical assemblage opens for an array of non-human elements. Participants discussed the importance of the teacher as a resource to enable learning in the subject. For example, Daniel said: *"The teacher would have to be clued into current topics – things that are currently going on, and being as up to date as the Internet."* Given that the high-stakes nature of Health Education at NCEA level in New Zealand is somewhat unique internationally, there is a paucity of literature surrounding effective pedagogy in relation to preparing students in the subject for assessment as part of a national qualification. Horsley (2008) in the New Zealand context noted that the teacher was a significant influence for high-achieving students in ways related to the comments from our participants. For example, being knowledgeable and prepared, and having skills in facilitation of learning/learners rather than direct instruction. Once more, this connects to the shifting roles in the assemblage of teacher-learner.

We were interested to explore the range of material teaching resources that participated in participants' Health Education learning. Unsurprisingly, resources from dynamic sources such as the internet featured prominently. For example, Ruby recalled the resources not just passively being given, but being able to be accessed, made sense of, and manipulated by the students, demonstrating the productive and affective nature of material resources in the pedagogical assemblage:

> Lots of stuff on the Internet . . . Videos and webpages so we can, instead of just sitting there and she's just talking, we can actually go and look at it ourselves. Which I find a lot better, I probably learn better that way."

Daniel connected the use of web-based resources to the globalised, networked world in which we live: *"We got a lot of stuff off the Internet. Teachers were relying more on the Internet and stuff for their resources, so it was interesting to see a worldly perspective on things and that really helped."*

A wide range of material resources, then, participate in Health Education teaching and learning. The use of digital tools mentioned above points to the need to recognise the changing nature of resources drawn upon to support learning: these are dynamic, in flux, and continuously being updated to suit emerging health-related knowledge and understandings in the world. Notwithstanding the caution by Gard (2014) that digital tools have the potential to serve the agenda of a commercialised, surveillance-based, and medicalised Health Education, a different use was found for digital resources within the Health Education pedagogical assemblage. This included bringing a globalised perspective to the learning through accessing a wide range of website-based information. These very real resources have the capacity, then, to reaffirm and capitalise upon the authentic nature of the learning in Health Education.

The use of human resources in Health Education (other than the teacher) also featured consistently throughout the interviews. Connections to the community provided participants with an experience of Health Education that was grounded in real life, which made the learning more memorable and rendered deeper knowledge and understanding of the topic being explored. Participants recalled the use of guest speakers to support learning for specific

topics in Health Education, and to bring a different, expert, or unsanitised perspective to the issues under consideration. Sally recalled that:

> It was good to get a different perspective rather than (teacher) going through something online and choosing out what she likes . . . A different outlook on the same things that we've been taught. They have a better understanding than something you can read online. It is these people, it is their life.

It is well documented that Health (and Physical) Education is an attractive site for external providers to become involved in classroom learning, with much critique of this practice (for example Leahy *et al.*, 2016; Powell, 2019). Participants in this study appeared to value the role of an external provider (guest speaker) as part of their Health Education experience. Thus, the careful, planned, and integrated use of guest speakers can be an effective (and affective) element in the pedagogical assemblage.

Connections to the community

Undertaking a health promotion process in the school or local community is the specific focus of a level 2 (year 12) NCEA Achievement Standard. This unit can be viewed as the pinnacle of Health Education learning in that it is heuristic, authentic and potentially empowering for learners who typically collaborate in small groups to work on an identified wellbeing issue for a group in the school or wider community. Participants' comments reflected a continuum of experiences of taking action, from those who affected change and felt that they could make a difference, to those who faced barriers to taking action. For example, Rebecca:

> We did health promotion in year 12 and we had to do it in groups. The barrier to that was we had to go through the principal. Our promotion was just a pink day, everyone wear pink to promote health. And she wouldn't allow that so we changed it three times and the principal still said no to all three, so we ended up just doing a video.

Rebecca's comment indicates that school leaders and teachers may not have wanted to relinquish control, thus for them the effect on them was destructive as it shut down their opportunities for being successful in a student-led project with real-world significance. Similar findings arise from an Australian research project on students' health promotion action by McGrath *et al.* (2017) who concluded that teachers experienced some discomfort in relinquishing the traditional teacher-learner role, and/or did not see the value in establishing meaningful connections in the community. He then reflected on an experience at the other end of the spectrum:

> So we did a hikoi [4] . . . and some (students) went to the council and spoke about that . . . (it) was very empowering and cool to think that we helped make a change with that. It definitely makes me think that I would want to do other things like that in the future.

Unlike the experience of Rebecca, the pedagogical practices in Helen's class enabled the students autonomy, space, and movement in and around the community. As a result, they were able to mobilise a wide range of people to create a meaningful event with significance for the wider community. The process of taking action blurred the boundaries of the classroom – opening up new possibilities for learning across new spaces. Helen's comment illustrates the affective capacities that resulted from the experience, which were "empowering and cool". Moreover, the experience planted a seed for her to take on future advocacy actions in her community.

Several participants had the experience of an overseas field trip as part of their Health Education learning. The participants discussed at some length how the experience was life-changing, eye-opening, and enabling for their learning and achievement in Health Education, as well as for their growth as a young adult. These findings extend Campbell-Price's (2015) research, which investigated the experiences of international school trips for New Zealand

students. Campbell–Price concluded that, although the longer-term impacts of overseas trips needed investigating, such trips allow powerful and deep learning, strengthen teacher-learner relationships, enable fresh perspectives on classroom learning, and provide authentic and active experiences. Given that my participants were a number of years out of school, the following comments provide evidence of some long-term impacts of the overseas learning experience. Zoe and Helen recalled their trips to a South Pacific Island, respectively:

> You knew that what you were learning about was real and everyday things . . . As soon as you arrived, you just knew the presence of the issues were really real. And you were meeting people that were involved. To meet women that would share their stories on the way they have lived, or what they've overcome. Yeah, definitely something that you'd remember forever.

> Seeing it firsth and made things stick in your mind a lot as well, as opposed to just reading something off a piece of paper. And also seeing women my age there made me be able to relate, thinking oh imagine that could be me . . . And learning about stuff like that to me is interesting, because it is real-life and it is real problems that people are facing. And it's stuff that I am still thinking about – once you came home, you didn't just close the book.

These experiences are somewhat unique, as only a minority of Health Education learners take part in overseas field trips for Health Education. However, the potency of the experience for our participants in terms of an experience as a teenager, and longer-term for their lives was striking. The New Zealand Ministry of Education's guide for Education Outside the Classroom (EOTC) is called *Bringing the Curriculum Alive* (Ministry of Education, 2016) and it appears to be the case that this was the experience of our participants: the in-the-field experience brought their classroom-based learning about an international health issue to life. It is important to note that EOTC can also be situated in the local community, for example as connecting to the discussion of taking health promotion action above. *Bringing the Curriculum Alive* defines EOTC as "curriculum-based learning and teaching that extends the four walls of the classroom" (Ministry of Education, 2016, p. 1). This includes school-based and local experiences, meaning that students do not have to travel far from home to experience first-hand aspects of the health-related issues they are investigating. In fact, a place-based approach to EOTC is highly valued: "Becoming and being place-responsive offers opportunities to enrich the lives of our students, our communities and our places" (Wattchow and Brown, 2011, p. 198). The notion of extending learning beyond the walls of the classroom is de-territorialising within the pedagogical assemblage. Through learning elsewhere, the boundaries of the learning environment are expanded and the role of the teacher is altered, as the way is paved for a wide array of new human and non-human elements to enter the pedagogical assemblage, shift the assemblage into a new space, and ultimately, effect learning and bring about a wide range of other affects.

Conclusion

In this paper, we posed an analytical question of our data and put the assemblage analytic to work in order to address the question we had posed: *what relations exist in an assemblage of Health Education teaching and learning strategies and what capacities are produced as a result?* The discussion above demonstrated an array of entangled, relational elements involved in the Health Education pedagogical assemblage and also explored how the assemblage and its affective flows establishes the capacities for learning in the subject. A wide variety of capacities materialised through the affective flows that circulated within the assemblage to provide evidence of what the Health Education pedagogical assemblage can *do*. The junior secondary Health Education experience was more likely to be saturated with unproductive, risk-based discourses than the senior secondary experience, through which productive capacities flowed. A predominant insight for us was the importance of the Health Education

student at the centre of the learning; which necessitates a fluid and dynamic approach to teaching and learning. Since every student, and every class is different, the pedagogical practices that a Health Education teacher will put to work are dynamic, they evolve, they come and they go, and can never be counted upon to be fool proof – nor guaranteed to be effective (or affective) for all learners. The pedagogical practices that Health Education teachers draw upon and deploy will always need to be varied and continually be developed through trial and error, as we all respond differently to the experiences with which we are engaged in the world of learning and the wider world which we inhabit.

Our analysis highlighted how the relations in the assemblage work together in combination to make the assemblage what it *is* and make it do what it *does*. However, once findings such as these are documented (in this paper), they are already out of date; the assemblage already having changed in structure, and new assemblages already having come about. None the less what we presented was the assemblage that came about from our analysis of the data in our participants' interviews. We engaged with the assemblage analytic (as connected to new materialist theory) to think with and through our data, which was produced by a conventional method (in-depth interviewing). While this is a limitation of our study, we see this as providing a starting point from which researchers can step from to collect/produce data in the field of Health Education differently in the future. For example, ethnographic methods in which the human and non-human are more fully explicated; using non-conventional textual data production methods such as inviting participants to write a story or poem, draw; repurposing artefacts from learners that have been used as classroom activities; participatory methods. There is so much more that can be researched and discovered about Health Education, and an ever-expanding array of ways of doing so, while "thinking with theory" (Jackson and Mazzei, 2012; Leahy *et al.*, 2020).

In the introduction to this paper, we drew upon the assertion by Fernández-Balboa (2017) that academic research in Health Education has not translated into everyday practices of schools or connected with policy. In context of the findings in this paper, we pose the following questions for teachers and/or researchers:

(1) How can researchers mobilise theory and critique in a way in which enriches our understanding about Health Education?

(2) Why is it important to inquire into Health Education in spaces where findings might be affirmative rather than connected to the sometimes-damaging tradition of critique of Health Education (Allen, 2018)?

(3) To what extent does a typical junior secondary Health Education programme (or teaching thereof) connect to some of the sentiments raised by participants in our study?

(4) Is junior secondary Health Education serving the learning needs of all learners and how can we encourage more males to study Health Education at the senior secondary level?

In conclusion, we hope that the approach we have taken in this paper sparks for readers new ways of thinking about the pedagogies used in the secondary Health Education classroom, what those pedagogies can *do* for learners and teachers, and finally how new materialist and post-qualitative research approaches can shift knowledge about Health Education into new spaces.

Notes

1. See http://ncea.tki.org.nz/content/download/3734/12066/file/health_matrix_jan14.doc for the current matrix of NCEA standards in Health Education.

2. Statistics are released annually by the New Zealand Qualifications Authority with entry and achievement data for individual subjects assessed in the NCEA. Data for recent years in Health Education indicate around 10% of students entered into the subject were male.
3. Sexually transmissible infection.
4. A Māori term meaning a protest March.

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About the authors

Rachael Dixon is a lecturer in Health Education at the University of Canterbury. She recently completed her PhD on senior secondary Health Education in Aotearoa. Rachael Dixon is the corresponding author and can be contacted at: rachael.dixon@canterbury.ac.nz

Gillian Abel is Professor and Head of Department in the Department of Population Health at the University of Otago, Christchurch. Her research expertise is in community-based participatory approaches which she uses to explore policy impacts on the health, safety and human rights of marginalised population groups.

Lisette Burrows is Professor in Community Health at Te Huataki Waiora, University of Waikato. She has been researching and teaching in the health and physical education sphere for over 20 years.

Testing effects of awareness of statewide smoke-free air law and risk perception on smoking behaviors

YoungJu Shin
Hugh Downs School of Human Communication, Arizona State University, Tempe, Arizona, USA, and
Nicole L. Johnson
Center for Access and Delivery Research and Evaluation, Iowa City VA Health Care System, Iowa City, Iowa, USA

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Abstract

Purpose – To reduce the smoking rates and alleviate societal problems associated with smoking, health administrators and policy makers have attempted to promote and implement statewide smoking free policy. The present study examined how adults' awareness of and attitude toward the smoke-free air law, their perceived risks of secondhand smoke and current smoking status were associated with smoking attitude and behaviors.

Design/methodology/approach – As part of the Indiana Adult Tobacco Survey, 2,027 respondents participated in cross-sectional telephone surveys. A series of independent sample *t*-test and binary logistic regression analyses were performed.

Findings – Awareness of the state law was inversely related to negative attitude toward smoking behaviors. Individuals who reported favorable attitude toward the state smoke-free air law and higher risk perceptions of secondhand smoke showed negative attitude toward smoking behaviors. Non-smokers and former smokers were significantly different from current smokers with regard to attitude toward smoking. Negative attitude was significantly related to intention to quit smoking. Awareness of the state law, perceived risk and current smoking status were key determinants for anti-smoking attitude and behavior.

Originality/value – Findings highlight the importance of effective dissemination of the state law and recommend a strategic intervention design that invokes risk perceptions of secondhand smoke.

Keywords Smoke-free air law, Tobacco control, Policy awareness, Transtheoretical model, Risk perception

Paper type Research paper

Introduction

Tobacco remains the number one cause of disease and death in the United States (Centers for Disease Control [CDC], 2019b). More than 20 million premature deaths attributable to smoking and the deleterious effects resulting from secondhand smoke exposure have been well documented in the last five decades (US. Department of Health and Human Services [HHS], 2019). Cigarette smoking harms every organ of the body, strips years from a life and costs more than most people can afford (CDC, 2019b). A report indicates that annual smoking-attributable economic costs from 2009 to 2012 reached an estimated $289–332.5 billion in direct medical care and lost work productivity (HHS, 2019).That is, smokers are more likely to

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have an absence from work than nonsmokers. Smokers also have higher rates of hospitalization, nursing home admission and total healthcare costs than those who have never smoked (HHS, 2019). Despite obvious risks of smoking, the most recent data indicates that just over 34 million (about 14%) American adults continue to smoke (CDC, 2019a). To assess smokers' attitudes about quitting (as an indicator of future cessation attempts) and risk perception within the context of specific smoke-free policies, the present study examines Indiana adult perception, attitude and behavior as a case study.

Past research points to policy as a way to change smoking behavior and health outcomes (Albers *et al.*, 2004; Fichtenberg and Glantz, 2002; Hahn *et al.*, 2008). Smoke-free air policies and laws reduce the prevalence of smoking and average daily cigarette consumption and exposure to secondhand smoke (Farrelly *et al.*, 1999; Levy *et al.*, 2004a; Moskowitz *et al.*, 2000). Workplace policies, specifically, have been noted to reduce smoking behavior by reducing the opportunity to smoke, decreasing pressure to smoke and increasing social support for cessation. More comprehensive smoke-free policies that include public places have also been found to be effective at reducing smoking (Hahn *et al.*, 2008; Moskowitz *et al.*, 2000; Seo *et al.*, 2011).

The Framework Convention on Tobacco Control encourages the creation of smoke-free work and public places and has been ratified by more than 150 countries, demonstrating the growing global fight against the tobacco epidemic (Fong *et al.*, 2006). *HealthyPeople 2020* set a goal for all United States and the District of Columbia to enact a statewide ban on smoking in public places and worksites by 2020 (US Department of Health and Human Services, 2014). Despite the push to protect everyone from secondhand smoke, 22 states have yet to pass comprehensive smoke-free laws as of March 2019 (American Lung Association, 2019).

Smoke-free policies

There is ample evidence suggesting effects of smoke-free policies on smoking behaviors. For example, a study examining effects of local California smoke-free workplace ordinances concluded that comprehensive restrictions led to more worksites with smoke-free policies and increased the likelihood that workers quit smoking (Moskowitz *et al.*, 2000). Students at Indiana University reported smoking fewer cigarettes and fewer students smoked on campus after a smoke-free air law was enacted (Seo *et al.*, 2011). Just one year after enacting the statewide smoke-free air law, Indiana ranked 45 in the country with about 22% current smokers (Behavioral Risk Factor Surveillance System, 2016). A ban on smoking in residential areas is also linked to decreased smoking prevalence, especially in states where public and workplace bans were already in place (Levy *et al.*, 2004b).

Risk perception. Many models of health behavior identify perceptions of individuals' health risks as a major influence on motivation to change attitude and behavior (Aiken *et al.*, 2001). For instance, smokers' risk perceptions are found to be significantly associated with a desire to quit smoking (Dillard *et al.*, 2006). Similarly, smokers were found to be more likely to underestimate their personal risk of cancer and heart disease than nonsmokers (Ayanian and Cleary, 1999; Klesges *et al.*, 1988b; Weinstein *et al.*, 2005). Risk perceptions tend to increase after the enactment of a smoking ban. In California, the proportion of employees reporting concern about health effects from secondhand smoke exposure doubled from 21.6% to 45.5% after workplace smoking bans were implemented (Tang *et al.*, 2004). One possible explanation for the change in risk perception is that the smoke-free policies empowered employees to challenge the acceptability of secondhand smoke in the workplace without negative consequences (Lu *et al.*, 2011).

Attitude. Smoke-free policies impact attitude toward smoking and toward the policies, themselves (Albers *et al.*, 2004; Moskowitz *et al.*, 2000; Rayens *et al.*, 2007). Attitudes change with time, especially after the enactment of a policy (Hahn *et al.*, 2008; Moskowitz *et al.*, 2000; Tang *et al.*, 2004). Home smoking bans represent underlying attitudes toward smoking that

are reflected in attitudes about stricter public smoking policies (Levy *et al.*, 2004b). Even smokers eventually support smoke-free laws once they have been enacted (Rayens *et al.*, 2007). For example, it was found that both smokers' and nonsmokers' attitudes shifted gradually in support of the total ban over four years after Finland's national smoke-free workplace law went into effect (Heloma and Jaakkola, 2003). These changes in attitude are influenced by several factors including knowledge about the risks of smoking, age, gender, race and smoking status (Diepeveen *et al.*, 2013; Doucet *et al.*, 2007; Tang *et al.*, 2003). The snowball effect, in which people who become accustomed to a smoke-free indoor environment in public places become less tolerant of exposure to secondhand smoke, might also explain changes in attitude (Tang *et al.*, 2003). Additionally, age is a significant moderator of population attitude about smoking interventions or bans (Diepeveen *et al.*, 2013). Women, African Americans and more educated individuals also tend to have significantly more positive attitudes toward anti-smoking policies (Doucet *et al.*, 2007).

Secondhand smoke. Attitude about secondhand smoke and perceived risk of secondhand smoke are also important variables in understanding the effects of smoke-free policies. Perception and knowledge about risks have strong implications for health behaviors (Reimer *et al.*, 2010) and the number of cessation attempts correlate with increased perceived risk of smoking (Klesges *et al.*, 1988a). National survey reports that perceived risk of smokers was substantially lower than the actual relative risk levels, which demonstrates rationalization of health risk behaviors (Weinstein *et al.*, 2005). In other words, smokers tend to underestimate their risk of being diagnosed with lung cancer (Weinstein, 1998; Weinstein *et al.*, 2005). Furthermore, non-smokers and former smokers rated smoking riskier than did smokers (Weinstein, 1998), indicating strong associations between perception of smoking risks and attitude and behavior toward smoking cessation.

Home and workplace smoking bans lead to decreases in exposure of secondhand smoke (Berg *et al.*, 2006; Brownson *et al.*, 1995). Previous research shows that home smoking bans are associated with the number of quit attempts, interest in quitting, long-term abstinence, nicotine dependence and number of cigarettes smoked per day (Berg *et al.*, 2006). The literature clearly presents that both attitudes about smoking behavior and smoking bans and perceived risk of secondhand smoke represent pivotal turning points for individuals considering quitting. Given these findings, the present study relies on the assumption that support for smoke-free policies corresponds with attitude about smoking. It is also guided by the Transtheoretical Model (TTM) as a theoretical framework.

Transtheoretical Model

The TTM (Prochaska and DiClemente, 1983) emphasizes the role of intent in understanding behavior change. Rather than simply a binary state of either *do* or *do not*, TTM explains that behavior change occurs through a series of six stages representing one's intention to change a behavior and its enactment (Prochaska *et al.*, 2008). The stages start with the conceptualization of status quo and no consideration for behavior change, proceed through increasing intent for change and then demarcate the new behavior by how long it has been performed. Ultimately, when encouraging anyone to enact a new health behavior (i.e. smoking cessation), the goal is to achieve true *termination* where there is no temptation to smoke again and the individual feels confident that there will not be a relapse (see Figure 1 for the six stages). In addition to stages describing the behavior change process, TTM also acknowledges the psychological processes underlying each stage of change. These Processes of Change provide guidance for interventions and practitioners, as processes are necessary to undergo in order to move through the Stages toward healthy behavior (Prochaska *et al.*, 2008). Of the 10 Processes, three of the first four are particularly relevant to the current smoke-free policy research: A) *Consciousness raising* involves increasing

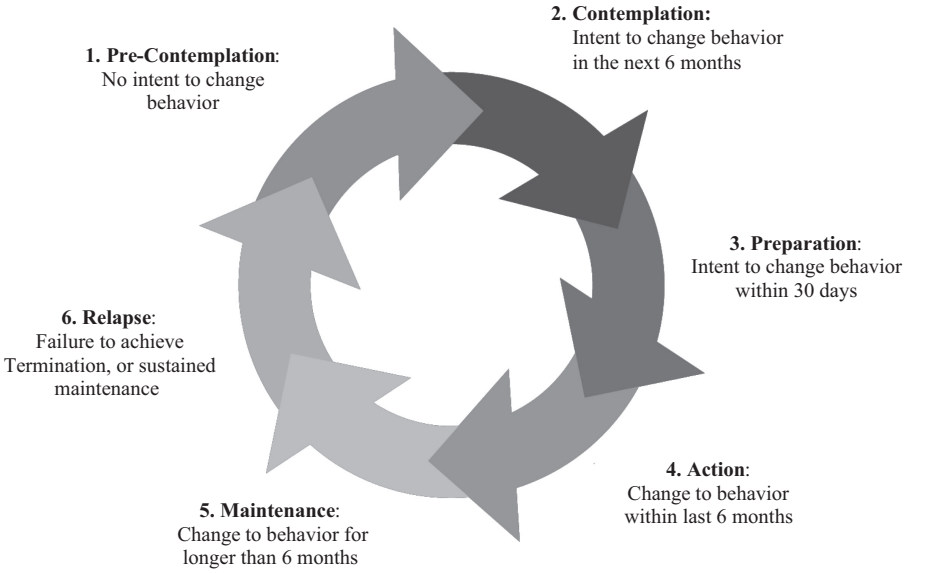

Figure 1.
Transtheoretical Model, stages of change

awareness about all aspects of the problem behavior including policies restricting the behavior, B) *Self-reevaluation* includes the logical and emotional assessment of oneself in relation to a behavior, and C) *Environmental reevaluation* includes logical and emotional assessments of how one's behavior affects their environment (e.g. risks of secondhand smoke) (Prochaska *et al.*, 2008). In the context of smoke-free policies and tobacco cessation, these three processes are at the beginning of the journey to quitting and are influential in encouraging individuals to quit smoking.

Indiana's first (and current) statewide smoke-free air law, House Enrolled Act 1149 (HEA 1149), went into effect on July 1, 2012 (Indiana State Department of Health, 2019). The law prohibits smoking in most indoor public establishments and workplaces, as well as within eight feet of each entrance to venues covered by the state law. Examples of places where smoking is prohibited include restaurants, bowling alleys, movie theaters, hotels and motels and office buildings, and establishments catering to an adult-only audience have been exempt from the ban. These exemptions from the smoking ban leave it up to individuals to enact restrictions either in their own establishments or in their local community, which requires strong anti-smoking attitude. Given that nearly two dozen states have yet to pass a comprehensive smoke-free policy, there is plenty room for nationwide improvement in order to achieve the goals of *HealthyPeople 2020*.

Although much attention is given to the tobacco control research, policymakers, intervention program planners and healthcare providers need to put continuous efforts to tailor effective health messages to their target audience, and improve health outcomes by encouraging smoking cessation and heightening risk perception of smoking. The current study expands our understanding of how awareness of and attitude toward smoke-free policies and secondhand smoke exposure impacts smoking behavior in Indiana residents as a case study. Five research questions were posed.

RQ1. Is awareness of the state smoke-free air law associated with attitude toward smoking behaviors at home (RQ1a), work (RQ1b) and public places (RQ1c)?

RQ2. Is attitude toward the statewide smoke-free air law associated with attitude toward smoking behaviors at home (RQ2a), work (RQ2b) and public places (RQ2c)?

RQ3. Is perceived risk of secondhand smoke exposure associated with attitude toward smoking behaviors at home (RQ3a), work (RQ3b) and public places (RQ3c)?

RQ4. Is attitude toward smoking behaviors associated with current smoking behaviors?

RQ5. Is attitude toward smoking behaviors associated with intention to quit smoking?

Methods

Participants and procedure

The current study used 2,027 responses from the grant project on the Indiana Adult Tobacco Study funded by the Indiana State of Department of Health. Using the stratified random sampling method, Indiana residents who were 18 years or older were recruited for cross-sectional telephone surveys in 2013, a year after the smoke-free air law was implemented. The stratified random sampling method (Cochran, 2007; Lwanga and Lemeshow, 1991) enabled researchers to estimate the calculation of a sample size, based on a population proportion with a specific criterion such as age (N = 7,013). The research center which specializes in health-related survey research conducted the participant sampling and collected survey responses using a random assignment program. Prior to data collection, the research procedure was approved by the institutional review board of the host institution.

The response rates for the survey were 17.6% for landline participants and 11.3% among participants on cell phones. The total response rate was 28.9% (N = 2,027) out of the estimated sample size (N = 7,013) for the stratified randomized sampling method. The respondents' age ranged from 18 to above 65 years (18–29 = 9.2%, 30–44 = 17.4%, 45–64 = 36.3%, 65 and above = 35.6%, Mage = 54.4 years) and 61.8% were female. A majority of the respondents were White (87.9%) and completed high school or higher education (less than high school = 7%, high school = 27.1%, some college or associates = 33.6%, college degree = 19%, postgraduate = 13.3%).

Measures

A single item was used to measure: *awareness of the statewide smoke-free air law*, "A law went into effect prohibiting smoking inside most public places in Indiana. Do you know about this new law?" (1 = yes, 2 = no); *attitude toward the statewide smoke-free air law*, "Would you say you favor or oppose this law?" (1 = favor, 2 = neutral, 3 = oppose); *perceived risks of secondhand smoke exposure*, "Do you think that breathing smoke from other people's cigarettes or from other tobacco products is . . ?" (1 = very harmful to one's health, 2 = somewhat harmful to one's health, 3 = not at all harmful to one's health); *current smoking behavior*, "Are you a current smoker?" (1 = no, 2 = yes); *intention to quit smoking*, "Do you want to quit smoking cigarettes for good?" (1 = yes, 2 = no).

Attitude toward smoking behaviors were contextualized to assess attitude at home, work and public places: *attitude toward smoking behaviors at home*, "In your opinion, inside a home, should smoking . . .?" (1 = always to be allowed, 2 = sometimes allowed, 3 = never be allowed); *attitude toward smoking behaviors at work*, "At workplaces, do you think smoking *indoors* should be . . .?", "At workplaces, do you think smoking *outdoors* should be . . .?" (1 = always to be allowed, 2 = sometimes allowed, 3 = never be allowed); *attitude toward smoking behaviors at public places*, "Should smoking indoors in *restaurants* . . .?", "Should smoking indoors in *bars, casinos, or clubs* . . .?" (1 = always to be allowed, 2 = sometimes allowed, 3 = never be allowed).

Results

Four sets of independent *t*-tests were run to test if awareness of the statewide smoke-free air law significantly affected attitude toward smoking. Attitude toward smoking behaviors at home (RQ1a) was significantly different between those who were aware of the statewide smoke-free air law ($M = 2.72$, SD = 0.58) and those who were unaware ($M = 2.78$, SD = 0.52). Also, there was a significant difference of attitude toward smoking in restaurants (RQ1c) between those who were aware of the law ($M = 2.71$, SD = 0.49) and those who were unaware ($M = 2.74$, SD = 0.48). The Levene's test for equality of variances was significant ($F = 12.67$, $p < 0.001$ for RQ1a; $F = 4.98$, $p < 0.05$ for RQ1c), so equality of variances cannot be assumed, $t(687) = -2$, , $p > 0.05$ for RQ1a; , $t(743) = -1.33$, , $p > 0.05$. The analyses, however, did not yield significant differences on attitude toward smoking at work and public places such as bars, casinos or clubs, suggesting that the awareness of the statewide smoke-free air law did not significantly influence individuals' attitude toward smoking at work (RQ1b) and bars, casinos or clubs. Although the statewide smoke-free air law significantly affected attitude toward smoking at home and restaurants where individuals mostly interact with family members, friends and other loved ones, the awareness did not change attitude toward smoking at work and other social gathering places. It is assumed that the awareness of the statewide smoke-free air law serves as a protective role for interpersonal relationship contexts but not for other public contexts.

Five sets of regression analyses tested whether attitude toward the statewide smoke-free air law significantly affected attitude toward smoking. There were significant relationships between attitude toward the law and attitude toward smoking behaviors at home ($F[1, 1{,}581] = 297.14$, $p < 0.001$; $t = -17.24$, $p < 0.001$, $\beta = -0.40$), work($F[1, 1{,}934] = 508.31$, $p < 0.001$; $t = -22.55$, $p < 0.001$, $\beta = -0.46$ for indoor; $F[1, 1{,}937] = 259.88$, $p < 0.001$; $t = -16.12$, $p < 0.001$, $\beta = -0.34$ for outdoor) and public places ($F[1, 1{,}958] = 637.66$, $p < 0.001$; $t = -25.25$, $p < 0.001$, $\beta = -0.50$ for restaurants; $F[1, 1{,}900] = 514.78$, $p < 0.001$; $t = -22.69$, $p < 0.001$, $\beta = -0.46$ for bars, casinos or clubs). The results suggested that those who were in favor of the law reported higher levels of anti-smoking attitude at home (RQ2a), work (RQ2b), and public places (RQ2c). It may be assumed that individuals holding a positive attitude toward the state smoke-free air law are determined to consistently have anti-smoking attitude at home, work and public places. Their political stance is in alignment with their attitude toward smoking.

Five sets of regression analyses tested whether perceived risk of secondhand smoke exposure was significantly associated with attitude toward smoking. There were significant relationships between perceived risk of secondhand smoke exposure and attitude toward smoking behaviors at home ($F[1, 1{,}579] = 180.99$, $p < 0.001$; $t = -13.45$, $p < 0.001$, $\beta = -0.32$), work ($F[1, 1{,}929] = 258.39$, $p < 0.001$; $t = -16.07$, $p < 0.001$, $\beta = -0.34$ for indoor; $F[1, 1{,}929] = 258.39$, $p < 0.001$; $t = -16.07$, $p < 0.001$, $\beta = -0.34$ for outdoor), and public places ($F[1, 1{,}926] = 225.89$, $p < 0.001$; $t = -15.03$, $p < 0.001$, $\beta = -0.32$ for restaurants; $F[1, 1{,}896] = 321.69$, $p < 0.001$; $t = -17.94$, $p < 0.001$, $\beta = -0.38$ for bars, casinos or clubs). The results discovered that those who perceived high risks of secondhand smoke exposure reported higher levels of anti-smoking attitude at home (RQ3a), work (RQ3b) and public places (RQ3c). Possible explanation is that individuals who perceive that the exposure to the secondhand smoke is harmful are more likely to have anti-smoking attitude at home, work and public places because of the danger of smoking.

Binary logistic regressions were performed to answer if attitude toward smoking was associated with current smoking behaviors and found that anti-smoking attitude at home ($OR = 0.28$, $p < 0.001$), workplace ($OR = 0.26$, $p < 0.001$ for indoor; $OR = 0.27$, $p < 0.001$ for outdoor) and public places ($OR = 0.26$, $p < 0.001$ for restaurants; $OR = 0.18$, $p < 0.001$ for bars, casinos, or clubs) were significantly higher among nonsmokers than current smokers. The findings are consistent with previous studies suggesting that

non-smokers show stronger anti-smoking attitude than current smokers (Tang *et al.*, 2003).

Binary logistic regressions were run to examine if attitude toward smoking was significantly associated with intention to quit smoking and revealed that higher levels of anti-smoking attitude at home ($OR = 0.54, p < 0.01$), workplace ($OR = 0.59, p < 0.01$ for indoor)and public places ($OR = 0.50$, $p < 0.01$ for restaurants; $OR = 0.58$, $p < 0.01$ for bars, casinos or clubs) were significantly related to intention to quit smoking for good (RQ5). The levels of anti-smoking attitude at outdoor work areas did not significantly affect intention to quit smoking. Anti-smoking attitude functions as a positive factor for individuals' intention to not smoke in most contexts, except for the outdoor work. This intent may indicate an individual's movement away from commitment to continue smoking altogether, which is the ultimate goal.

Discussion

The results revealed that individuals who were aware of the statewide smoke-free air law were less likely to allow smoking behaviors at home and restaurants than those unaware of the law. The findings demonstrate the value of TTM as a framework for understanding behavior change. While state smoking policies may not immediately translate to cessation, we can see a promising movement in attitude in the right direction. Awareness also significantly influenced attitude toward smoking at places where children are at risk to be exposed to secondhand smoke. This finding is consistent with prior research that supports a positive attitude shift toward smoking bans following implementation of a policy (Moskowitz *et al.*, 2000; Rayens *et al.*, 2007). The attitude shift can be explained by increased risk perception of secondhand smoke exposure followed by awareness of smoke-free policies, which is important in the United States, a country where policies do not target smoking behavior in the home, a context in which children would likely be exposed (Aiken *et al.*, 2001; Dillard *et al.*, 2006).

Awareness of the statewide smoke-free air law, however, did not affect their attitude toward smoking at work and public places such as bars, casinos or clubs. The connotation of such public places being intended for adult-only crowds may lead individuals to feel less adamant to ban smoking. Perhaps children's health outcomes are perceived as more valuable than adults', especially adults who smoke, or there is a misconception that adults' health is more resilient to secondhand smoke. Future research should explore the underlying beliefs that impact conflicting attitudes about smoking and secondhand smoke exposure in public places where children are and are not present.

Individuals who were aware of the statewide smoke-free air law were also asked to report their attitude toward the policy. Individuals with favorable attitude toward the state policy were found to be less likely to favor allowing smoking behaviors at home, work and public places than those opposed to the policy. In other words, individuals who agree with the statewide smoke-free air law hold stronger anti-smoking attitude at various places than those who do not support the policy, which is consistent with recent findings on compliance with a smoking ban on a large midwestern college campus (Record *et al.*, 2017). These findings are consistent with past literature on the attitude toward policies and attitude toward smoking behaviors (Blendon and Young, 1998; Heloma and Jaakkola, 2003; Rayens *et al.*, 2007). For future tobacco prevention efforts, public health campaigns must recognize the importance of effective dissemination of the state smoke-free policy and aim messaging at shaping positive attitude toward the statewide smoke-free air law. This approach to increase awareness of the policy has been proven to positively impact attitude about, and thus enactment of, smoking bans in areas not covered under the state policy's jurisdiction (i.e. home).

Perceptions of secondhand smoke exposure were also found to be significantly associated with attitude toward smoking behaviors. Individuals who reported a high level of perceived

risk of secondhand smoke exposure were less likely to favor allowing smoking at home, work and public places than those who perceived fewer health risks from secondhand smoke. In other words, as individuals perceive harmful effects of secondhand smoke, they are inclined to discourage smoking behaviors in all contexts. Consistent with previous research (Dillard *et al.*, 2006), these findings support evidence documenting that perceived risk is one of the key determinants for anti-smoking attitude and behavior. By increasing an individual's perceived risk of tobacco smoking and exposure, public health policies do their part in encouraging movement through the stages of the TTM, closer to the action – tobacco cessation. Tobacco prevention efforts must also consider how to clearly communicate the health consequences of secondhand smoke exposure in a way that strategically invokes risk perceptions.

Attitude toward smoking behaviors was significantly related to current smoking behaviors. Anti-smoking attitude at home, work and public places were found to be higher among non-smokers than current smokers, meaning that there is a strong association between anti-smoking attitude and smoking behaviors. Anti-smoking attitude was also found to have a significant association with intention to quit smoking for good, which demonstrates the impact policies may have on an individual's movement through the TTM stages toward action and maintenance of a healthy behavior. Individuals who reported higher anti-smoking attitude concerning smoking bans for indoor workplaces, restaurants, bars, casinos and clubs were more likely to report intention to quit smoking. In past research, the overall positive benefits of smoke-free laws were acknowledged among smokers and nonsmokers (Rayens *et al.*, 2007). These findings confirm that anti-smoking attitude plays a significant role in predicting smoking behaviors and intention to quit smoking (Berg *et al.*, 2006). Practitioners should target attitude toward both personal and social smoking behaviors by reinforcing anti-smoking attitude for non-smokers and changing smokers' attitude toward smoking behaviors to increase intention to quit smoking.

The present study is not without limitations. First, the analysis included single items to measure some of the key variables to answer the research questions. Although the research questions were based on the previous literature and guided by the theoretical framework, the measurement was limited in detecting significance by asking questions with a dichotomous response option (yes/no). To address this measurement issue, independent *t*-tests and binary logistic regressions were performed accordingly and detect statistically significant findings, but future research will benefit from using multiple questions to assess the key variables and validate the reliability test. Data collection (telephone surveys) may have had implications for the sample population characteristics, such as age. For example, the median age for Indiana residents from 2013–2017 was 37.5 years old (US Census Bureau, n.d.), but the average age of the sample population was over 50. It is plausible that younger people may have screened and ignored phone calls from unknown numbers. Underrepresentation from younger demographic populations may have limited the generalizability of our findings, particularly for a population that could gain relatively significant health and economic benefits from smoking cessation compared to an older population. Telephone surveys may have also excluded participants with certain disabilities. Furthermore, qualitative inquiry on cultural and psychosocial factors should be considered in future work to explain underlying socioeconomic disparities that are presently represented in smoking behaviors.

Given the timeline of the cross-sectional survey data collection, we can confidently say the data adequately represents Indiana residents' awareness, risk perception, attitude and smoking behavior in a timely manner relative to the policy enactment. Future scholars should conduct longitudinal research to investigate individuals' change over time and how the policy implementation affects smoking cessation long term. This approach would also give more credence to the tenets of TTM, showing change in attitude and behavior over time. Even though TTM is criticized for its assumption that humans experience coherent and stable changes in behaviors and attitudes, the model is useful in understanding the necessary work

that goes into making a health behavior change for most people. Additionally, an ecological approach to understanding trends for smoking cessation that considers the myriad of factors contributing to one's attitudes and risk perceptions about smoking (e.g. stigma, norms, cessation support and resources) would also contribute to more comprehensive explanation of the policy intervention. Lastly, a comparison dataset from a neighboring state would increase the generalizability of the present findings.

Conclusion

The present study reinforces the importance of communication campaigns for anti-tobacco policies for moving smokers' attitudes toward an intent to quit. As the Transtheoretical Model posits, several psychological processes including one's consciousness about smoking and its health risks, compelling one to be introspective about their own behaviors and how they impact their environment are imperative as an individual moves to changing a behavior permanently such as quitting smoking. We acknowledge that the process leading to smoking cessation may be more nuanced and individualized than TTM illustrates in its linear model of the association between attitudes and behaviors. However, the findings discussed here reinforce the strong relationship between tobacco policies and cessation.

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Corresponding author
YoungJu Shin can be contacted at: Youngju.Shin@asu.edu

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Beliefs and perceptions about breast cancer among the people living in rural and less privileged areas in Sindh, Pakistan

Nadia Agha and Rahim Dad Rind
Shah Abdul Latif University, Khairpur, Pakistan

Abstract

Purpose – Globally, women suffer from a lack of knowledge about breast cancer (BC), its symptoms and treatment. The purpose of this paper is to examine how people living in rural and less developed areas in Pakistan perceive BC. The study investigates the level of knowledge about BC in rural communities and analyses how the prevalent perceptions and beliefs impact women's lives and delay the diagnosis.

Design/methodology/approach – This study is based on 42 in-depth interviews with the women who have undergone BC treatment during the past five years. The participants were interviewed were the residents of the northern Sindh, southern Pakistan.

Findings – Findings show that BC was perceived as a contagious disease transmitted through touching or being physically close to the patient. Some women were abandoned by their husbands because of this perception. Faith in fatalism and the perception that BC is an incurable disease were common in communities with low socio-economic status. This is likely to affect the prevention and early detection of BC.

Originality/value – The study shows a strong co-relation of awareness with the prevalent perceptions regarding BC. Therefore, we recommend promoting health literacy and introducing culturally specific interventions in remote communities to enhance their understanding of the available treatment and help remove misconceptions about BC.

Keywords Breast cancer, Pakistan, Perceptions, Patriarchy, Health

Paper type Research paper

Introduction

Breast cancer (BC) is one of the leading causes of mortality among women. According to the estimates of WHO (2018), 2.1m women around the world are diagnosed with BC. BC related deaths are preventable if it is diagnosed at an early stage. Pakistan has the highest rates of BC in Asia; it is estimated that about 40,000 women die every year because of this disease (The Pink Ribbon Pakistan, 2020). This rate can be reduced with early detection when patients have greater chances of survival. This is why early detection is considered a key for the cure of BC (WHO, 2017).

Globally, poor women, particularly those from rural areas, suffer from the lack of knowledge about BC and focus least on early detection (See: Oluwatosin, 2006). Screening of BC has a strong correlation with women's low levels of awareness about the process (Donnelly *et al.*, 2015). The lack of knowledge about breast self-examination and mammography is not limited to women with no or low levels of education. It is also evident among the women who are literate and are working in the education sector (See: Alharbi *et al.*, 2012). Breast self-examination, which helps in early diagnosis, is greatly influenced by the support which the patient receives from the family, friends or community (Rosmawati, 2010). This practice of self-examination is affected if the patient receives poor support from the people who matter.

BC diagnoses are laden with profound psychological scars for women such as stress, depression, fear of its recurrence, apprehension about the future and family. It is considered a catastrophe for patients and their families (Taleghani *et al.*, 2006). A study on the Iranian

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women with BC found that the women were engulfed with a lack of confidence and fear, and needed enhanced emotional support (See: Joulaee *et al.*, 2012). The patients experience many psychological issues like stress, anxiety and depression coupled with physical ones, which have an adverse impact on the quality of life.

South Asian women acquire poor knowledge of risks and warning symptoms of BC (Sathian *et al.*, 2014). The lack of knowledge about BC is also evident among Pakistani women. Multiple studies have documented how insufficient knowledge and illiteracy reduced the survival rate among patients (Agha and Tarar, 2019; Gulzar, 2018). Usually, women have no idea about initial signs and symptoms and this unfamiliarity with the disease is likely to cause a delay (See: Naz *et al.*, 2016; Siddiqui *et al.*, 2016). A study on BC demonstrated that more than half of the patients underwent screening when the disease had reached the advanced level (Khokher *et al.*, 2016). This requires an investigation of the factors causing a delay.

Most of Pakistan's population lives in rural areas with inadequate provisions of services. The World Bank has recently highlighted that a substantial chunk of people in rural areas live under the most disadvantaged conditions (World Bank, 2018). Women in such areas are more likely to face the brunt of socio-economic discrepancies and suffer more than their urban counterparts, who have better opportunities and access to healthcare facilities (Baade *et al.*, 2016). It has been reported that women in rural and remote areas of Pakistan experience many difficulties accessing BC screening facilities. Such facilities are usually located in big cities for which they have to travel a long distance (Pakistan Today, 2013).

Cultural beliefs, attitudes and religion also have a significant role in the care and decisions regarding cancer treatment as well as coping strategies (Al-Amoundi *et al.*, 2015; Azaiza and Cohen, 2008; Donnelly, 2006). Women in Pakistan are not independent in making health-related decisions (WHO, 2017). Their lives are constrained by patriarchy, and they have restricted access to the public sphere. Therefore, it is crucial to analyse how life-threatening diseases, like BC, are perceived by the people who influence women.

Prevalent beliefs and perceptions regarding cancer reflect the level of knowledge about cancer in a community. These beliefs and attitudes are likely to help in explaining how such beliefs intervene with cancer treatment. A person's health-seeking behaviour is influenced by such beliefs and can cause a delay in early detection (Kishore *et al.*, 2008). For example, in a study conducted in North Carolina, the majority of BC patients believed that doctors work on the directives of God. At the same time, some believed that it was useless to treat cancer medically because it is only God who can treat it (Mitchell *et al.*, 2002). Fatalism is another dominating issue among cancer patients. A study on Chinese, Korean and Mexican Americans BC survivors in the United States found that the factor of fatalism was prevalent in all age groups; women believed that their disease was the result of fate or destiny. It was something already determined (Gonzalez *et al.*, 2015).

Education plays an important role in enhancing one's understanding and shaping beliefs and perceptions about diseases. According to Jana *et al.* (2017), people with low education levels in Bankura, West Bengal, India, were frequently influenced by beliefs and perceptions. For example, participants with the above primary education levels believed cancer as a non-contagious disease compared to those who had primary level education. Encouraging attitudes and positive perceptions around BC are poor. In another study conducted on the Northern Nigerian women by Azubuike and Celestina (2015), it was found that a significant number of participants did not know about BC. Education seemed to have a strong correlation with their perceptions regarding cancer being curable, the effectiveness of screening and the role of evil spirits in cancer. The extent of what they knew and believed about cancer is expected to make little difference in their perceptions or health-seeking behaviour.

BC is one of the major health concerns in the developing world (Akuoko *et al.*, 2017). The disease is likely to increase in developing countries more than the developed world, accounting for more BC-specific mortalities (Ferlay *et al.*, 2002). This will require more healthcare resources (Ibrahim *et al.*, 2008), increasing the financial burden on low-income countries. This paper is an extension of our previous study on family support to BC patients (See: Agha and Tarar, 2019). Beliefs and attitudes are potential predictors to analyse people's health-seeking behaviour of BC. Therefore, in this paper, we analyse rural and less privileged communities' perceptions and beliefs about BC, and the influence these attitudes exert on BC patients' lives. This study will help to investigate people's level of understanding towards a life-threatening disease and where further interventions can be made to raise awareness and educate people about BC.

Methods

A total of 42 women, aged between 18 and 62 years, were contacted for in-depth interviews (See: Table 1). Participants were purposively selected from different areas of northern Sindh, southern Pakistan. The inclusion criteria were (1) women (2) with BC (3) been under treatment for no more than five years.

The sample was identified based on the inclusion criteria. We approached the participants through intermediaries who either knew the survivors or were in any relation with them. For example, we first contacted the gynaecologists, who usually are the first point of contact when a woman wants to have her symptoms of BC examined. We requested the gynaecologists to provide us contacts of the women who met the selection criteria and

Table 1. Demographic information of the participants

Demographic categories		Frequency
Age	18–22 years old	02
	23–27 years old	02
	28–32 years old	05
	33–37 years old	04
	38–42 years old	07
	43–47 years old	05
	48–52 years old	10
	53–57 years old	04
	58–62 years old	03
Education	None	10
	Primary (5years)	11
	Secondary (8years)	05
	Higher secondary/Matric (10 years)	06
	Intermediate (12 years)	00
	Graduate	03
	M.A	06
	MBBS/MPhil	01
Marital status	Married	39
	Unmarried	01
	Divorced	02
Number of children	01–02	06
	03–04	16
	05–06	13
	07 and above	03
	N/A	04

agreed to give voluntary participation. We also used personal contacts in a few villages where intermediaries facilitated us in accessing BC survivors.

Once the sample was identified, we made an appointment to conduct the interview. Prior consent was sought from each participant before making any formal contact with them for an interview. We understand that we dealt with a sensitive problem that needed trust between the interviewer and the interviewee; to address this, we began the conversation with the participants asking about their family, education, children, friends, daily routine and social life. This helped us to build rapport. The interview guide was prepared keeping in mind the socio-cultural background of the participants as well as the nature of the problem. For example, the interview guide contained questions about how were the initial symptoms assessed, who did the women share their initial symptoms of BC with, how did that person guide them, how did the women access the doctor, how did they feel after being diagnosed with BC, how did their families react on this, what was their community's or more specifically their relatives' reaction on the disease, what strengthened and weakened their beliefs and perceptions about BC and what mattered the most during the process of treatment?

Data analysis procedure

The interviews were conducted in the participants' mother tongue, i.e. Sindhi or Urdu and were later translated and transcribed into English. After transcribing the data, we followed the six-step model given by Braun and Clarke (2006) to analyse the interviews. The model helped us to develop themes by adopting an appropriate procedure. We first familiarised ourselves with the transcribed data; we then systematically organised the data to generate initial codes. Initially, several codes were identified, which we merged to generate themes. For example, codes of BC as a predetermined disease, belief in fate, or God's will were merged into the main theme named "faith in fatalism". In this process, we refined and organised the themes that helped us identify four main themes of the study namely misconceptions about BC, faith in fatalism, BC, a contagious disease, and the impact of people's perceptions on the diagnosis of BC. We then drafted the final report in the last step of the procedure suggested by Braun and Clarke.

Results

The majority of the women in this study belonged to poor households. The socio-economic status of the household was determined by the income level, job status of the male head, ownership of valuables such as house or land etc. It was found that most of the participants did not have any valuables: some lived in extended households which was a shared property. Only a few women's families owned some land, which was source of their livelihood.

The women in this study either lived in less privileged small towns or villages where quality healthcare services were scant. Most of these women and their families had limited literacy (See: Table 1). Literacy was not common among men either. Many women's husbands were shopkeepers, rickshaw drivers or tailors, who do not require much literacy. Only three women's husbands were doctors, whereas one woman's husband worked in a multinational company.

This study was conducted in the areas where patriarchy was prevalent and women were expected to undertake the role of service providers as wives, mothers and daughters. In our sample, we found that women pursued what was indoctrinated to them by male family members. They had a limited social life because their mobility was constrained. Even their access to a health expert for their check-up was conditional upon men's consent. Although the women were required to carry out gender-specific roles, these roles were impacted

significantly during their treatment; many lost their worth in the family and instead became an economic burden.

Misconceptions about BC

All of the women in the study were not aware of BC and its signs or symptoms. Their families also lacked any knowledge. Although we did not interview the women's families, the participants frequently articulated that their families did not have experience about BC and were unable to assess the symptoms. The initial signs, such as a lump or swelling, were expected to be healed by itself which caused the delay. Some of the affected women and their families had heard of the disease as fatal. Still, their socio-geographical location was a barrier to understanding what BC actually was and how it was diagnosed and treated. Since the communities, where these women lived, did not have scientific knowledge about BC, they strongly believed that BC was fatal and the woman who was affected was going to die soon. This belief further exacerbated women's situation who were already struggling with their socio-economic problems. The psychological impact of such a belief was significant on these women: for example, when 39-year-old Nazia was diagnosed with BC, her son would ask her frequently whether she would die. Her son had overheard this while her family members were discussing her disease. Others went through immense psychological pressure as well. The diagnosis became a matter of life and death for 22-year-old Ghafooran, who was engaged with her cousin. Her fiancé refused to marry her after she was diagnosed with BC. He only agreed to marry Ghafooran upon the condition of marrying another woman also if he married with her. Both families accepted the terms.

The belief that BC cannot be cured, and other perceptions associated with it, had a negative impact on the women who were already struggling on many social and financial fronts. This was not novel. The women, their families and the communities where they lived possessed poor scientific knowledge about the disease and believed what others had told them. Apart from considering BC as a fatal disease, it was mostly associated with other factors that did not belong to reality. Their perceptions about BC and its causes had considerable influence on the women's health-seeking behaviour because many of the women we interviewed were driven by such perceptions, which ultimately caused the delay.

Faith in fatalism

The women we interviewed encountered several hurdles in early presentation, diagnoses and treatment of BC. The factor of faith in fate was central among them. They often related their disease as predetermined. They also believed that it was already written in their fate and that there was little they could do to save themselves. The perception further aggravated the lives of the women and resulted in delayed presentation. For instance, 41-year-old Nighat, who was fighting for her life, shared:

> My in-laws did not believe in BC treatment and viewed it as incurable. They often said that whatever was destined in my future would indeed happen. My parents and relatives had the same opinion that if death is predestined in my fate, no power on Earth can prevent it.

However, Nighat was aware that she could recover from the disease if her family gave her financial support to seek a timely treatment of BC. Unlike Nighat, many marginalised women suffered due to the patriarchal mindset which sets its faith in fate. Men owned overall finances in the family and decided how to spend the available money. The money is less likely to be spent on health, education or well-being of women. In our sample, we found that the women were powerless to approach hospitals without the consent of their male counterparts. They believed whatever their families told them, i.e. BC has already been written in their fate.

The majority of the women in the study had no knowledge about mammography or screening. They perceived BC symptoms as normal cyst which could be healed with the passage of time. The misconception about the exhibiting symptoms of BC further exacerbated the lives of the women. Women with lack of education and awareness were more likely to rely on fate and access hospital for the initial diagnoses late. During our interviews, we found that women with limited education held their belief more in fate than those who had basic education and awareness about the risks of BC. Women with education and awareness perceived BC and its treatment differently; for example, 39-year-old Kiran did not believe in fate. When the symptoms of BC appeared, she did not wait for any miracle to cure her disease. She went to a doctor for diagnosis without wasting time. She was aware that fate had nothing to do with the disease and only timely treatment could save life of a BC patient. She expressed her views:

> When I was diagnosed with BC, my in-laws believed it was written in my fate and, therefore, they refused to initiate any treatment. I sensed like I was walking on the edge of death so I did not believe in this perception. I managed to outsmart my spouse and called upon my parents and discussed the issue. They instantly took me to the hospital for treatment and thank God my health is improving now.

Although Kiran had only basic level of education, she knew the tragic outcome of BC if it was not screened and treated timely. She learnt this from one of her relatives who had suffered from BC, but had not gone for proper treatment. The woman died after a few months. This experience within the relatives saved her life. Another woman, 53-year-old Nasreen, also did not rely on fate and successfully recovered from BC. She was a graduate and had some awareness of the risk factors of BC. When she felt a lump developed inside her breast, she discussed this with a lady doctor who advised her to go for mammography. She was diagnosed with BC in the initial stage. Kiran and Nasreen saved their lives and defeated BC only because they did not waste their time believing in fate and sought early diagnosis and timely treatment.

Such belief in fate seems incongruous and serious for the victims of BC as it could cost them their lives. Many women we interviewed blamed fate and did not opt for medical attention, e.g. 57-year-old Nazeeran held the same view that God governed every moment of her life, and therefore, it was useless to cry on the misfortune. This proxy belief in fate inhibits timely diagnoses of BC and also endangers the lives of the patients.

In this study, other women associated their bad times to the fate and deeds in their daily lives. One of the respondents held a view that everything happens because of our actions. If people do good deeds, bad would not be written in their fate and vice versa. Disease, loss, punishment or any other misfortune was the outcome of dastardly deeds. Hajra, 28-year-old, who was divorced after her BC was diagnosed, told:

> I passed every moment in stress since the diagnosis. The psychological condition was more painful than the physical one. Despite mastectomy, I was told that the disease is beyond remedy and has spread to the lungs. Each moment is agonizing and I am more concerned about my child. Everyone has tried to make me realize that this is divine punishment. My story has buzzed around the village and I have been labelled as the bad woman on my visiting male doctors for check-up. I am being punished for the sins I never committed.

Women like Hajra are often unaware that this disease is curable if the patient begins a timely treatment. Such patients' perception about cancer or any other major disease is associated with fate and they are made to believe that they suffer due to their sins or curses. They cannot alter their fate or do away with any misfortune if God does not want. Women with this belief are less willing to undergo screening test of BC despite having clear signs or symptoms.

Breast cancer, a contagious disease

The notion that cancer is a contagious disease posed many challenges to the women with BC; for instance, lack of social support, economic dependence, social alienation, anxiety and depression. The family members and relatives of the patients avoided interacting with them and segregated their household appliances and daily use utensils from them. This finding is consistent with Akuoko *et al.*'s (2017) study in which most of the participants believed that cancer can be transmitted from one person to another and that close contacts with the cancer patient were the major cause of their ailment.

In this study, many women stated that people of their community viewed cancer as an infectious disease and feared it could infect anyone who shared anything with the patients. Therefore, they abstained from eating or even taking anything from the patient. In our sample, few women's immediate family members, like husbands, separated his bed and children from the wife to not get infected. This further worsened the social life of the BC patient and became the cause of social isolation, as in the case of 37-year-old Ruhi. She shared her experience.

> When my husband heard about the disease, he immediately changed his bed and asked me to keep myself away from my children. He warned our kids to avoid taking anything from me. My eating utensils were separated. It was a sorry state of affairs that my husband was told to divorce me as it is infectious and dangerous for the whole family or better to leave me at my parent's home. Simultaneously, when the people of my town heard about my disease, they did not bother to come to my home to inquire about my health. My cousins, relatives and neighbours became very conscious as they considered it a contagious disease. This isolation and hatred from my community members and relatives devoured my body and aggravated my grievances further.

Women in this critical state of mind need emotional and moral support from family members and relatives, but in Ruhi's case, she was estranged by her husband and in-laws to escape the infection of BC. Such conduct with the patients left little room for them to strive for survival. Ruhi encountered multifaceted challenges within her family and in the community where she lived. She further went on sharing the ordeal she coped with:

> During my treatment process, I saw many BC patients suffering from trauma and depression. My in-laws told me many times that I have only few years more to live. This negative attitude impacted my well-being greatly.

The perception of BC being a contagious disease had a negative social impact on the women. Their community members kept a distance from the patients, which made the women feel disgraceful about themselves. It created social distance which resulted in isolation and loneliness. Rehana and many women like her were victims of misconceptions around BC. She completely isolated herself because of people's attitude towards her disease which was not contagious in reality. She lost her hair and looked older than her age during chemotherapy, which she thought further validated people's claims of BC being fatal and contagious. She was no more a normal person because people's attitude towards her condition added more pain and distress to her life. She was sent to her parents' home where her brother financed her treatment. A similar experience was shared by 19-year-old Ambreen who discontinued visiting her relatives after she was diagnosed with BC. She noticed that her relatives also minimised their visits to her family and would not take anything from her or eat with Ambreen or with her family members.

However, the practice of social distancing from a BC patient was not universal. Some women in our sample did have supportive relatives who were concerned about their health and well-being–for example, 58-year-old Haleema who was the first patient of BC in her village. The villagers regularly visited her to enquire about her health and were sorrowful about her disease.

BC patients have to cope with many challenges ranging from social to psychological ones. During the treatment of BC and its looming side-effects, the patient has to experience several issues for instance, disfigurement of her body, loss of sexual intimacy with her husband and challenges of taking care of her children (Sreerekha *et al.*, 2012). BC patients' well-being has a strong correlation with how their families perceive the disease. Husband's empathy plays a therapeutic role for the wife struggling with BC (Agha and Tarar, 2019). Therefore, attitudes influenced by misconceptions and beliefs about BC are likely to leave a long-lasting impact on women's lives who need an enhanced degree of support and care. This made many women, who experienced BC, ask themselves questions like why it happened to them, why people were looking at them with hatred and how they could get rid of the disease. These queries caused intense pain and embarrassment to the women with BC.

Impact of people's perceptions on the diagnosis of BC

People living in the areas, we collected data from, considered BC a communicable and infectious disease. Thus, they forbad everyone in the family to sit, share or even talk to a BC patient. This derogatory behaviour from spouse and relatives was heart-wrenching and ruined some women's already deteriorating condition. In our sample, women with literate family backgrounds were less vulnerable to social degradation on account of their family members than those whose family members had no or less formal education. Male guardianship prevailed in the rural areas and women were solely dependent on men for everything they needed. Therefore, the husband's education level was found to be a significant element that influenced the health-seeking behaviour of women.

All of the women in this study revealed that the people of their community lacked awareness and health literacy. Therefore, they assumed BC differently depending upon their family's socio-economic background. In our study, we found that families with sound income, awareness and education were less likely to fall prey to people's perceptions about BC as a contagious disease rather, they extent every support to the patient to seek the treatment at an early stage. For instance, Komal, a 27-year-old woman with master-level education, was diagnosed with BC. She was a primary school teacher and belonged to an educated family. Hence, she did not face any social issues and her family remained supportive of her. She shared her experience:

> I have not felt any sort of behavioural change from my family members, but I did feel changes in my close relatives. Sometimes they avoid taking anything from me or eating with me.

Education, awareness and income levels have a more significant impact on the health-seeking behaviour of local people. For instance, 50-year-old Saira did not have much education, but she had the necessary information about BC. She was aware that BC is not an infectious disease and thus managed to access healthcare facility by her sheer willpower. She also received unconditional support from her family. She was at the initial stage of the disease. Yet, she faced social challenges from her community when she disclosed her disease to them. She shared her experience:

> Because of the counselling at the cancer hospital, I used to tell people without any shame that I had BC. Some of my relatives were taken aback. I remember they used to tell me not to take this disease's name or tell anyone about it. Once, some relatives had come from a village, and I remember they would not take stuff from me to eat. They even told their children not to eat anything I gave them. In addition to that, being called a "bechaari" (a helpless woman) and pitied upon was an everyday experience.

The perception about BC being a contagious disease is likely to have a huge impact on the survivorship of the patients. The social distance that community members maintain from the patient and the reluctance of the family members to initiate the treatment affects the patient's

willingness and courage to defeat the disease. Consequently, their disease reaches the advanced stage where there are minimum chances of survival as in the case of Hajra whose in-laws did not take her for treatment. Her condition worsened and she was sent to her parents. Her cancer was at the last stage when she was taken for treatment. She died after two weeks of her interview.

People's attitudes, influenced by how they perceived BC, left a significant impact on women's perceptions about themselves. Resultantly, this not only increased their reluctance for screening but also impacted their psychological well-being. BC survivors experienced one of the most common issues, i.e. stress about the disease, worries about their status, womanhood and their usual role in the family. They started living a life of uncertainty and thinking of approaching death. Most of the women in our sample revealed that the diagnosis of BC symptoms was not less than a nightmare as the entire process was fear-stricken. Many women avoided undergoing regular mammography due to inadequate knowledge about BC survivorship and its symptoms. They were frightened of cancer-like disease and were reluctant to undergo the screening test. They feared if it was detected, that would not only make their lives hell, but would also ruin their social living in society. For instance, 41-year-old Bushra, when asked if she underwent a screening test of BC when she felt its symptoms, said:

> I shared the signs of BC with a relative who already had the history of BC. She suggested me to go for a mammography test to make sure if it was a symptom of BC. I started shivering in fear. I decided that I would never go for the screening test because I would be quarantined forever and would lose my social life if it was detected. The condition worsened over time. My husband took me to the hospital due to my chronic health conditions. I was diagnosed with BC, and it was in the second stage.

Although Bushara doubted that there was something wrong, she still did not access screening tests owing to women's weak positioning in society. If she had acted upon her relative's advice, the situation would not have turned that worse. Her symptoms of BC were at the initial stage when she had felt pain first time beside her breast, but due to social stigma, she kept her symptoms secret till it reached the grey stage. Bushra had a history of a relative Azera. Azera's life had become horrible after she was diagnosed with BC. She went into isolation and had completely disconnected herself from the social world. Her in-laws and family members believed that it was an infectious disease, and going beside or touching the infected person could be lethal.

Discussion

This study was conducted to examine perceptions and beliefs around BC among the people living in rural and remote areas of Pakistan. The findings of this study indicate a strong correlation of lack of awareness about the prevalent perceptions regarding BC. The main themes emerging from the study, i.e. misconceptions about BC, faith in fatalism or BC, a contagious disease, are reflective of the knowledge of the people in the study area. The key findings of this study reveal how misconceptions, lack of knowledge and belief in fatalism determine BC patients' fate by hindering their timely access to the treatment. The findings also indicate the adverse social environment that misconceptions about BC create for BC patients.

Attitudes and beliefs around BC are major indicators to explain why BC patients access health services late. It is a fact that belief in fate and waiting for a miracle to come and cure the disease is one of the major barriers to early diagnosis of BC. Pakistan is an Islamic society in which faith in fate is central. Peoples' behaviour is largely influenced by prevailing cultural and religious beliefs. A study examined fateful belief in Asian and American societies and it found that cancer was considered as a fate. Fateism is a major belief that affects individuals' cancer screening behaviour of and poses a later presentation of cancer and its treatment

(Polek and Hardie, 2016). The factor of faith was also evident among the respondents we interviewed. Some respondents disclosed that they were unable to prevent anything from happening if it was already destined in fate. They believed that they had meagre control over their lives as everything was already decided. The approach to healing of the local individuals was largely governed by the prevalent religious notion of fatalism. This attitude severely affected health of the women by causing delays and increasing their pain.

Patients' willingness to go for treatment is influenced by the beliefs they hold, e.g. it is God's will, only he can treat it (Mitchell *et al.*, 2002). The impact of such beliefs can be seen among the women regardless of age group or ethnicity (Gonzalez *et al.*, 2015) and can be devastating for women and their families. Fatalism is an interesting but complicated concept. It cannot always be an attitude; it can be a coping strategy as well to respond to the illness (Franklin, 2007). Religious fatalism regarding cancer can be well explained concerning traditional societies where cancer is seen as God's will (Rajaram and Rashidi, 1999). Although religious fatalism is common among cancer patients, their attitudes may differ depending upon their agency. For example, a study on Hispanic Catholics in Massachusetts found that cancer patients commonly expressed fatalistic beliefs. Yet, they also acknowledged the role of self-agency in dealing with the aftermath of cancer (Leyva *et al.*, 2014). This suggests that fatalism cannot be universal in a given culture. Religious fatalism is vital in explaining health-seeking behaviour in Muslim counties. A study on BC survivors in Iran found that almost all participants correlated their disease with God's will. Surprisingly, they also actively followed the treatment (Harandy *et al.*, 2009). Given that this study dealt with the people who had limited literacy and no scientific knowledge, the factor of fatalism was dominant among them which is expected to cause hurdles in the way of treatment and give loss to the lives of women.

It is a fact that early detection of BC is mostly related to the decreased mortality (WHO, 2018). In contrast, majority of the women in our sample lacked health education and awareness about BC. Misconceptions around BC are often created by a lack of scientific knowledge and limited education. According to Jana *et al.* (2017), education played an important role in the beliefs and perceptions among cancer patients as patients with lower levels of education were more occupied with misconceptions. Evidence from our study highlight that health literacy and formal education are vitally important to tackle the prevailing perceptions around BC. Women with formal education and awareness did not consider this disease as transmittable. They were also able to receive support from family members and relatives. In our sample, Komal and Saira gained family support to fight against the disease because their family had education and awareness to understand the gravity of the situation. Both Komal and Saria did a disproportionately better job at handling BC phobia and, therefore, were less vulnerable to such proxy perceptions.

However, family's attitude, along with perceptions and beliefs, towards BC may also be perpetuated by socio-economic factors as most of the participants we interviewed belonged to poor families. Their husbands and in-laws lacked resources to finance the expenses of the treatment of this life-threatening disease. Even if these people had sold their valuables, there was no certainty of complete recovery. This encouraged them to abandon the woman, disown her, or send her back to her parents' home; to get rid of the financial burden they were unable to afford. It has been documented that seeking diagnosis and treatment of BC on time is next to impossible for people in Pakistan who are already struggling with their low socio-economic conditions (Gulshan *et al.*, 2018; Talpur *et al.*, 2011). Such underprivileged conditions are also associated with reduced survival rate (Gulzar, 2018). Majority of poor cancer patients cannot receive standard treatment as the cost of the treatment is higher than their monthly income (See: Zaidi *et al.*, 2012).

Negative perceptions, lack of knowledge, fear about cancer, inaccurate information coupled with financial constraints not only led to underreporting but also hampered many women to participate in the screening process of BC, eliminating the chances of speedy

recovery. Such perceptions have serious repercussions on the health-seeking behaviour of women living in less-privileged areas. Prevalent beliefs and perceptions make these women more vulnerable to fatalism and eventually their cancer is diagnosed at an advanced level. Going through medical intervention or seeing a doctor becomes a nightmare for many women despite believing that there could be cancer symptoms. This attitude causes delayed presentation. Poverty seemed to have played an additional role in how some families treated the women who were diagnosed with BC.

Our main aim to conduct this research was to explore how BC is perceived among the people living in less privileged areas where literacy is not common. This study highlights that people living in these areas are more likely to be influenced by misconceptions about a life-threatening disease, e.g. BC, because of their socio-economic background and scant scientific knowledge. The attitudes around BC have lifelong consequences for women and families. The misconceptions about BC add to women's misery, instead of providing them any relief and are likely to increase BC related mortalities. Such misconceptions also perpetuate severe clinical and public health repercussions. BC patients need a supportive environment with psychological counselling to keep their morale high.

The findings of this study indicate that the prevailing misconceptions create an adverse impact on the quality of life as the women with BC lived a socially isolated life and experienced stigma. This is expected not only to lead them to a higher risk of mental health issues such as anxiety or depression, but women may also find themselves experiencing low self-esteem. The prevailing beliefs and perceptions also procrastinate patients' access to cancer treatment which ultimately increases the cost of treatment and puts an extra burden on the healthcare resources of the country.

Prevailing misconceptions about BC create difficulties for women in accessing diagnostic services and timely treatment and can contribute to BC specific mortality. The situation in underprivileged areas requires immediate interventions. Improving women's understanding about prevention, diagnosis and treatment of BC can alter attitudes and beliefs regarding this life-threatening disease (Akuoko *et al.*, 2017). Family support plays a central role in the patient's well-being. If men are given awareness about BC, their empathy and support can provide a healing impact to the patient (See: Agha and Tarar, 2019). Health education is significantly important. Several sources such as healthcare professionals, women who recovered from BC, media and community leaders should be taken on board for creating awareness and educating people (Donnelly *et al.*, 2013). Studies have demonstrated how educating and training women can also be an effective way in altering their attitudes around BC as well as enhancing their understanding about breast self-examination (Ibitoye and Thupayegale-Tshwenegae, 2019).

To counter cancer fatalism, smart and culturally specific interventions are needed. For example, a video story intervention was done on rural senior citizens, resulting in improved knowledge and decreased fatalism (Powe, 1999). Pakistan is a Muslim majority country. It is possible to engage religious and spiritual leaders with health messages regarding BC which could help alter attitudes and promote optimistic thinking. Religious beliefs could also be combined with health messages in order to remove misconceptions. These short-period measures may be useful, but a long-term and sustainable approach is essential to bring a real change in rural and less privileged areas. Improving health literacy is significantly important in terms of disease management and enabling individuals to make informed decisions about their and their families' health. People from under privileged areas should know that BC is preventable, and if BC is diagnosed at the initial stage, there are greater chances of survivorship.

Results of this study indicate a complicated nature of concepts and beliefs around life-threatening diseases, e.g. BC. More research is required to enquire further how such attitudes determine health-seeking behaviour and influence health outcomes. The current study was

based only on the accounts of 42 women belonging to different parts of Sindh province. The similar study needs to be replicated in other regions of Pakistan to assess the prevalence of cancer-related misconceptions.

Conclusion

This study investigates the prevailing beliefs and perceptions about BC among the people living in rural and less privileged areas in southern Pakistan. Findings indicate that the disease is surrounded by many misconceptions, such as BC being a contagious disease or a result of sins. This perception can make many women lose their home as a few women in our sample were abandoned and sent back to their parents' home after being diagnosed with BC. Belief in fatalism is also common among the people in these areas. Such beliefs and perceptions cause delay and have a negative impact on survivorship. Women's education and awareness played an important role in countering the misconceptions around BC as two women in the study fought with the stigma and accessed the treatment on time. Besides, family support also played a therapeutic role in this. However, such examples are not frequent as literacy is not common among the people living in these areas. Misconceptions around BC have many public health and clinical repercussions as patients are likely to experience social alienation and stigma. Based on the findings, we suggest introducing immediate measures for health literacy and raising awareness among the people living in marginalised areas. Smart and culturally specific interventions can bear fruitful results, such as circulating video messages or using religious leaders to spread health awareness. This can contribute to controlling BC-specific mortality rates in low-income countries where women face numerous challenges.

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About the authors

Dr. Nadia Agha is Associate Professor in Sociology at Shah Abdul Latif University, Khairpur, Pakistan. She has a doctorate degree in Women's Studies from University of York, England. She actively writes on women's issues in Pakistan. Her main interests remain in the field of family and women: she is interested in kinship, patriarchy, women's status, household division of labour and the girl child. She has written several research papers in national and international journals. Her recent work has been published in Asian Journal of Social Science and Journal of Research in Gender Studies. Nadia Agha is the corresponding author and can be contacted at: khan.ag@hotmail.com

Rahim Dad Rind has done MPhil in Sociology from Shah Abdul Latif University, Khairpur, Pakistan, with special focus on girls' education. His research interest is in the field of gender and education as he himself belongs to a rural area where women's educational levels are very low and they are subjected to everyday violence.

University students' knowledge about and attitudes toward e-cigarette use and factors influencing students' e-cigarette use

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Surapong Chudech and Piyapong Janmaimool
Department of Social Sciences and Humanities, School of Liberal Arts, King Mongkut's University of Technology Thonburi, Bangkok, Thailand

Abstract

Purpose – This study aims to investigate university students' knowledge about and attitudes toward e-cigarette (EC) use. It will also examine whether students' EC use is associated with knowledge about and attitudes toward EC use. The study also aims to analyze the determinants of students' use of ECs. The effects of gender, smoking behavior and friends' and family members' smoking behaviors on students' use of ECs were analyzed.

Design/methodology/approach – Completed questionnaire surveys were received from 1,362 students at King Mongkut's University of Technology Thonburi in Bangkok City, Thailand, in November and December 2019. Chi-square tests and an independent samples *t*-test were conducted to determine whether students' knowledge about ECs and attitudes toward EC use influenced their use of ECs. A logistic regression analysis was performed to identify significant factors affecting students' use of ECs.

Findings – The results revealed that students' EC use was associated with knowledge about ECs: Students with less knowledge about the harmful effects of ECs were more likely to use them. In addition, students who were EC users had more positive attitudes toward EC use than those who were not EC users. The results also revealed that male students, students who had also smoked tobacco cigarettes and students with friends who smoked tobacco cigarettes were more likely to use ECs. These results could suggest strategies to reduce the use of ECs among university students.

Originality/value – This study provides deep understanding about university students' knowledge about and attitudes toward EC use and their participation in EC use. The result clearly shows university students who are participating in EC use still have less knowledge about EC, thus, they have positive attitudes toward ECs. Gaining social acceptance from friends who use EC also influences students' decision to use EC. Therefore, EC use among students could significantly increase overall EC use.

Keywords E-cigarette use, E-cigarette harm perception, Attitudes toward e-cigarette use, University students

Paper type Research paper

1. Introduction

Although e-cigarettes (ECs) were fairly widespread in Thailand before 2014, they were not very popular. Since 2015, they have become much more popular due to their lower cost and higher convenience compared to tobacco cigarettes. In 2017, the design and size of ECs were improved, increasing their popularity. Various types of ECs with different formats and

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models were introduced. Those were such as a rechargeable EC, a disposable EC, a medium-size tank device, large-size tank devices as well as an e-cigar and an e-pipe. Most of ECs became smaller and more convenient to use and had attractive features. The addition of various flavors of e-liquids (EL) and an increase in EC producers further boosted the popularity of ECs in Thailand.

ECs have been widely advertised on social media, which adolescents often access. Adolescents can easily encounter EC advertisements and become motivated to purchase them. ECs have become very popular among Thai adolescents (Loysamut, 2018), leading to growing concerns among public health organizations. The survey conducted in Thailand by Baiya *et al.* (2020) showed that EC users who were students were approximately 15%. The recent study of (Savigamin *et al.* (2020)) revealed that approximately 22% of college students in a university reported EC use in the past 30 days. This number was high and comparable to other countries such as European countries and the USA even worse, it was found that a great number of college students reported using both ECs and tobacco cigarettes. ECs can be widely accessed by Thai adolescents through local-websites and friends (Savigamin *et al.*, 2020). EC use among adolescents in the USA has been increasing as well: 4.7% of US high school students used ECs in 2011; this increased to 37.7% in 2015 (Office of the Surgeon Gen, 2016). Another study reports that most EC users in United States are adolescents (Jamal *et al.*, 2017).

One of the primary concerns around EC use is addiction due to the nicotine ECs contain (Grana *et al.*, 2014). Nicotine dependence among adolescents can lead to other types of drug abuse and dependence, such as cocaine and amphetamine addition (Office of the Surgeon Gen, 2016). EC use can also contribute to the motivation to use other types of cigarettes, such as tobacco products (Watkins *et al.*, 2018). One study found that adolescents who have used ECs three times are more likely to start using combustible tobacco cigarettes (Soneji *et al.*, 2017). In many countries, tobacco use among adolescents is decreasing, but the number of EC smokers is increasing (Leventhal *et al.*, 2015).

EC use may contribute to a range of negative health impacts. The vaping aerosols in ECs contain harmful chemical compounds, such as chromium, nickel, copper, zinc, tin and lead. These harmful chemicals could enter the human lung and cause direct injury to the respiratory system (Grana *et al.*, 2014). EL can also have severe health effects as it can contain several carcinogenic metals, including manganese, lead, chromium, nickel and cadmium. EL may also cause headaches or diarrhea (Glasser *et al.*, 2017). The long-term health effects of EC use are not clear; however, several studies have suggested that ECs might contribute to respiratory disease (Grana *et al.*, 2014; Palamidas *et al.*, 2014), high blood pressure (Loysamut, 2018) and disturbed brain development among adolescents (Office of the Surgeon Gen, 2016; Kamat and Van Dyke, 2017).

To encourage adolescents to avoid EC use, it is necessary to understand adolescents' knowledge of and attitudes toward EC use, as well as how this knowledge and these attitudes affect their use of ECs. Previous studies have found that adolescents in Thailand and overseas are aware of EC use (Office of the Surgeon Gen, 2016; Anand *et al.*, 2015; Chapman and Wu, 2014; Greenhill *et al.*, 2016; Pepper and Brewer, 2014), but only a few know about the potential harmful effects of ECs (Roditis and Halpern-Felsher, 2015). Some studies have found that adolescents have incorrect understandings of EC use; namely, they believe that ECs have fewer negative health impacts than tobacco cigarettes (Anand *et al.*, 2015; Greenhill *et al.*, 2016). Another study found that few adolescents believe that ECs are harmful or toxic (Pepper and Brewer, 2014). Many studies have found that adolescents believe ECs to be less harmful than tobacco cigarettes and other types of cigarettes (Anand *et al.*, 2015; Amrock *et al.*, 2015). Surprisingly, some adolescents believe that EC use can help improve lung function (Roditis and Halpern-Felsher, 2015), and some believe that ECs contain no nicotine (Greenhill *et al.*, 2016). Thus, those adolescents thought that ECs are less likely to lead to addiction than tobacco cigarettes (Choi and Forster, 2013).

To encourage adolescents to avoid EC use, it is also necessary to explore the factors influencing their use of ECs. Gender is one important factor; males and females could have different motivations for using ECs (Piñeiro *et al.*, 2016). While a number of studies have investigated gender differences in smoking behaviors (Johnston *et al.*, 2016; Singh *et al.*, 2016), few have examined gender difference in EC use. Most studies find that males are more likely to smoke than females (Warren *et al.*, 2006; Greaves, 2007), but female smokers are more likely to experience negative health impacts (Zang and Wynder, 1996; Langhammer *et al.*, 2003; Gold *et al.*, 1996). For instance, the study of Baiya *et al.* (2020) revealed that most of EC users in Thailand were males. Identifying gender-related differences in adolescents' EC use could support the development of effective strategies to promote behavioral changes. Another factor that might influence adolescents' decisions to initiate EC use is the recommendations and smoking behavior of friends and family members. Some tobacco smokers believe that ECs have fewer negative health impacts and therefore switch from tobacco to ECs (Pepper *et al.*, 2014). For adolescents, the decision to initiate EC use could be also based on the influence of friends and family members; this is particularly true for female smokers (Piñeiro *et al.*, 2016).

Based on relevant literature, EC use among adolescents could be affected by several factors including risk factors (Barrington-Trimis *et al.*, 2015), psychosocial factor (Barrington-Trimis *et al.*, 2015), factors related socio-economic characteristic (Park *et al.*, 2017; Pitriyanti *et al.*, 2018) and nicotine addiction (Park *et al.*, 2017; Perialathan *et al.*, 2018). Risk factors refer to factors related to one's perceived harmful or negative effects of EC use (Barrington-Trimis *et al.*, 2015). Those factors are such as knowledge about ECs and attitudes toward ECs and cigarettes. People who have positive attitudes toward EC use and perceive low risks associated with EC use can be more likely to use ECs (Barrington-Trimis *et al.*, 2015; Pitriyanti *et al.*, 2018; Perialathan *et al.*, 2018). Psychosocial factor refers to one's perceived acceptance of smoking behaviors by social groups such as friends and family members (US Department of Health and Human Services, 2012). People living in a social environment which smoking behavior is widely accepted can be more likely to use ECs (Barrington-Trimis *et al.*, 2015; Stanwick, 2015; Kandel and Kandel, 2015). Several socio-economic characteristics can also affect people' motivation to use ECs. Those are such as gender, age and income. Most studies reported that males were more likely to use ECs (Barrington-Trimis *et al.*, 2015; Park *et al.*, 2017; Perialathan *et al.*, 2018), and the study of Perialathan *et al.* (Perialathan *et al.* (2018) also reported that EC use among younger age group was the highest. The study of Park *et al.* (2017) found that adolescents having a greater amount of monthly allowance were more likely to use ECs than those who having a lower amount of monthly allowance. People's nicotine addiction is also influential. Some studies revealed that people who were a cigarette smoker were more likely to use ECs (Park *et al.*, 2017; Perialathan *et al.*, 2018) because they would like to try a new smoking product.

For this study, EC use among adolescents and adolescents' knowledge about and attitudes toward EC use will be explored. Both knowledge and attitudes can significantly shape adolescents' perceived risks associated with ECs and finally affect risk acceptance. Understanding the association between EC use and knowledge of and attitudes toward EC use could provide significant implications for the development of health communication strategies. Additionally, the study also focuses the role of social norms in affecting adolescents' EC use. Considering adolescents' behavioral adjustment, their behaviors can be heavily affected by social influence (Telzer *et al.*, 2018). Finally, the influence of nicotine addiction among adolescents and their gender on EC use are also investigated; so that, specific characteristics of adolescent EC users can be identified.

This study has three research objectives. First, it aims to investigate Thai university students' participation in EC use and to investigate those students' knowledge of and attitudes toward EC use. Second, it analyzes the effect of students' knowledge and attitudes on their EC use. Finally, it evaluates factors that may influence students' use of ECs. The factors included in the analysis are gender, smoking behaviors and friends' and family

members' smoking behaviors. These factors were selected because they could contribute to differences in EC use and could explain differences in male and female smokers' use of ECs.

2. Materials and methods

2.1 Participants and ethical considerations

The participants in this study were undergraduate students at King Mongkut's University of Technology Thonburi in Bangkok, Thailand. The participants were in the first to the fourth year of their university studies and were enrolled in the academic year 2019. A total of 1,500 students were invited to participate in this study; 1,362 students, or 90.8%, completed and returned the survey. All participants were asked to complete a consent form. In completing a consent form, all participants were informed about the research objectives and data collection processes, and they were also informed that their participation was voluntary. In completing a questionnaire, participants were not requested to indicate their personal information which can identify them. This study was also approved by the research ethics committee of the School of Liberal Arts, King Mongkut's University of Technology Thonburi.

2.2 Tool and measurement

This research used a questionnaire survey, which was distributed to undergraduate students at King Mongkut's University of Technology Thonburi. The questionnaire aimed to measure participants' knowledge about ECs, attitudes toward EC use, participation in EC use and smoking behaviors. It also addressed participants' associations with friends and family members who are EC smokers, as well as demographic characteristics such as gender, age and year of study. The following questions were used to measure participants' knowledge of ECs: 1) Have you heard about EC products? 2) Are you very familiar with the components of ECs and their potential harmful effects? 3) Are you aware that ECs are illegal in Thailand? 4) Do you know that importing EC products from overseas can result in fines and jail time? 5) Do you know that trading ECs and possession of ECs in Thailand can result in fines and jail time? Participants could respond with yes (1) or no (0).

A four-point Likert scale was used to measure participants' attitudes toward EC use; possible answers ranged from 1 = completely agree; 2 = agree; 3 = disagree; 4 = completely disagree. Participants were asked to indicate the degree which they agree with these following statements: 1) ECs are healthier than tobacco cigarettes. 2) EC use can aid smoking cessation. 3) EC use can lead to smoking tobacco cigarettes. 4) EC use with electricity does not cause any public health problems. 5) ECs should not be controlled the way that tobacco products are controlled. 6) ECs should not be restricted in workplaces and public spaces. 7) Smoking ECs makes smokers look up-to-date and smart. To measure participants' participation in EC use, they were simply asked whether they had used ECs; they could respond with yes (1) or no (0). To measure participants' relationships with EC smokers, they were asked whether their parents or any of their friends who had smoked cigarettes. Participants were also asked whether they had smoked tobacco cigarettes to measure participants' smoking behaviors.

2.3 Data collection and analysis

The content validity of the developed questionnaire was measured using the face validity technique. The questionnaire was also validated with 30 undergraduate students. The internal consistency of the scales used to measure all the variables was tested by calculating Cronbach's alpha. Cronbach's alpha was 0.76, which is above the minimum value of 0.7. The questionnaires were distributed to undergraduate students at King Monkut's University of Technology Thonburi in November and December 2019.

The data were then analyzed. First, descriptive statistics were calculated for the participants' demographic characteristics, including average age, year of study, gender, friends' smoking behaviors and parents' smoking behaviors. Second, a chi-square test and an independent samples *t*-test were performed to measure the association of students' EC use with their knowledge about and attitudes toward EC use. Third, multivariate logistic regression analyses were conducted to test the effects of gender, smoking behaviors, friends' EC use and parents' EC use on students' EC use. SPSS version 17.0 was used for all the analyses.

3. Results

3.1 Participant characteristics

Slightly more than half of the participants (50.6%) were female; 49.4% were male. The average age of participants was 20.56 (±1.36) years. The largest cohort, 43.7%, was in their fourth year at university; 24% were in their second year and 17.5% were in their third year. The smallest cohort was first-year students, who accounted for 14% of participants. Only 11.3% of participants reported participating in EC use; 24.2% had smoked tobacco cigarettes. Moreover, 38.9% reported that their parents smoked cigarettes, and 63.5% reported that some of their friends smoked (see Table 1). Of the participants who reported having participated in EC use, 79.2% were male, and most were in their fourth year of studies. In addition, 88.3% of EC smokers reported having friends who were cigarette smokers, and 61.7% of EC smokers reported having parents who were cigarette smokers (see Table 1).

3.2 Influence of students' knowledge about and attitudes toward e-cigarette use on participation in e-cigarette use

Table 2 shows the findings regarding participants' knowledge about ECs. Chi-square tests were performed to test for a significant association between knowledge about ECs and participation in EC use. The results show that having heard of EC products did not influence students' participation in EC use. Significantly fewer EC users than non-users reported knowledge of ECs' components and potential harmful effects (20.1 vs 57.8%, $p < 0.01$). In contrast, more EC users than non-users knew that ECs are illegal in Thailand (86.4 vs 73.5%,

Variables	EC users		Non-EC users		Total	
	Mean/*n*	SD/(%)	Mean/*n*	SD/(%)	Mean/*n*	SD/(%)
Gender						
Male	122	79.2%	567	46.9%	689	50.6%
Female	32	20.8%	641	53.1%	673	49.4%
Average age (Years)	20.73	±1.86	20.54	±1.27	20.56	±1.35
School level						
1st year	32	20.8%	159	13.2%	191	14%
2nd year	24	15.6%	314	26.0%	338	24.8%
3rd year	34	22.1%	204	16.9%	238	17.5%
4th year	64	41.6%	531	44%	595	43.7%
Friends' smoking behaviors						
Smoker	136	88.3%	729	60.3%	865	63.5%
Non-smoker	18	11.7%	479	39.7%	497	36.5%
Parents' smoking behaviors						
Smoker	59	38.3%	471	39.0%	530	38.9%
Non-smoker	95	61.7%	737	61.0%	832	61.1%

Table 1. Participant characteristics

Variables	EC users	Non-EC users	Statistics
*Knowledge about ECs**			
I have heard of EC products	140 (91.5%)	1,126 (93.3%)	0.31
I am very familiar with the components and potential harmful effects of EC products	31 (20.1%)	686 (57.8%)	<0.01
I know that ECs are illegal in Thailand	133 (86.4%)	873 (73.5%)	<0.01
I know that importing EC products from overseas can result in fines and jail time	95 (62.5%)	250 (21.5%)	<0.01
I know that trading and possession of ECs can result in fines and jail time in Thailand	87 (57.2%)	270 (23%)	<0.01
*Attitudes toward EC use***			
ECs are healthier than tobacco cigarettes	1.95 ± 0.67	2.54 ± 0.75	<0.01
EC use can aid smoking cessation	2.14 ± 0.77	2.87 ± 0.73	<0.01
ECs use can lead to smoking tobacco cigarettes	2.45 ± 0.74	2.21 ± 0.69	<0.01
EC use with electricity will not cause any public health problems	2.37 ± 0.75	2.80 ± 0.74	<0.01
EC products should not be controlled the way that tobacco products are controlled	2.44 ± 1.0	2.69 ± 0.83	<0.01
EC use should not be restricted in workplaces and public spaces	2.40 ± 0.85	2.97 ± 0.83	<0.01
Smoking ECs makes smokers look up-to-date and smart	2.82 ± 0.81	3.28 ± 0.75	<0.01

Note(s): *These results are based on the result of chi-square test, **1: "completely agree"; 4: "completely disagree"; these findings are based on the results of independent samples *t*-test

Table 2.
The influence of knowledge about ECs and attitudes toward EC use on participation in EC use

$p < 0.01$). Similarly, more EC users knew that importing EC products from overseas and trading or possessing ECs in can result in fines and jail time in Thailand (see Table 2).

In general, EC users reported significantly more positive attitudes toward EC use than non-EC users. For instance, EC users were more likely to believe that ECs are healthier than tobacco cigarettes. EC users also believed that EC use with electricity would not cause any public health problems. In addition, EC users indicated that EC use could aid smoking cessation. In contrast, non-EC users were more likely to believe that EC use could lead to use of tobacco cigarettes. EC users were also more likely to agree that EC products should not be controlled the way that tobacco products are ($M = 2.44$ vs $M = 2.69$, $p < 0.01$). Similarly, EC users were more likely to believe that ECs should not be restricted in workplaces and public spaces. EC users were also more likely to believe that smoking ECs makes smokers look up-to-date and smart (see Table 2).

3.3 Factors affecting students' EC use

A multivariable logistic regression analysis using a binary logistic regression was performed to test the effect of gender, smoking behavior and friends' and parents' cigarette smoking on participants' EC use. The results are shown in Table 3. Several factors, including gender, smoking behaviors and friends' smoking behaviors, correlated significantly with participants' EC use. Male participants were 4.31 times more likely to use ECs than females (OR = 4.31, 95% CI = (2.87, 6.46), $p < 0.01$). Participants who had smoked cigarettes were 12.65 times more likely to use ECs than non-smokers (OR = 12.65, 95% CI = (8.60, 18.63), $p < 0.01$). Furthermore, participants who had friends who smoked were 4.96 times more likely to use ECs (OR = 4.96, 95% CI = (2.99, 8.22), $p < 0.01$). However, parents' smoking behaviors did not significantly influence students' EC use (see Table 3).

4. Discussion and conclusion

EC products are often advertised on social media, and most university students are regularly active on social media. As a result, most students have heard about EC products (Tobacco

Predictors	Adjusted odds ratio	95% confidence interval
Gender	4.31*	2.87–6.46
Male		
Female		
Smoking behaviors	12.65*	8.60–18.63
Have not smoked tobacco cigarettes		
Have smoked tobacco cigarettes		
Friends' smoking behaviors	4.96*	2.99–8.22
Non-smoker		
Smoker		
Parents' smoking behaviors	0.95	0.67–1.37
Non-smoker		
Smoker		

Note(s): *$p < 0.01$

Table 3. Multiple logistic regressions predicting students' EC use

Control ResearchK, 2019; National Statistical Offi, 2019; Mantey *et al.*, 2016). This study found that several aspects of knowledge about ECs significantly affected students' participation in EC use. Students who use ECs were more likely to know about laws and regulations affecting EC use in Thailand than those who did not use ECs. Most EC users also have friends who are smokers, so they could acquire this information from their friends (Wang *et al.*, 2018; De Vries *et al.*, 2006). Another aspect of this finding is that EC users participate in EC use despite knowing that it is illegal in Thailand. This study also found that many students who use ECs did not have adequate knowledge of the components and potential harmful effects of ECs. This suggests that students should be educated about the components of ECs and the possible negative effects of EC use.

Students who were EC users were more likely to have positive attitudes toward EC use. More specifically, they thought that ECs are healthier than tobacco cigarettes and that EC use does not cause any public health problems. In fact, EC use can contribute to detrimental health outcomes because the vaping aerosols in ECs contain several harmful chemical compounds, such as chromium, nickel, copper, zinc, tin and lead (Grana *et al.*, 2014). Though, the short and long-term health effects of EC use cannot be clearly identified, students should be educated with potential harmful effects from vaping aerosols in ECs and chemicals in ELs. With the knowledge about potential harmful effects caused by EC use, students can construct an appropriate level of risk perception and decide to avoid using ECs.

Students also felt that EC use could make them look smarter. Most EC users also believed that EC use could help smoking cessation and opposed controlling or restricting EC use in public spaces and workplaces. These positive attitudes toward EC use could be explained by the fact that most participating EC users had previously smoked tobacco cigarettes, and the harmful health effects of tobacco cigarettes are generally known. ECs were introduced as a healthier replacement for tobacco cigarettes (Walsberger and Havill, 2015). Moreover, positive advertisements for ECs on social media could significantly impact students' attitudes toward ECs (Sabbir, 2016).

This study further found that male students were more likely to use ECs than female students. This is consistent with a report by the Thai national statistics office indicating that males are more likely to participate in smoking behaviors than females (National Statistical Offi, 2019). Another study in Thailand reports that males are 5.25 times more likely than females to participate in smoking behaviors (Sasin Graduate Institute, 2014). Many other studies have found that males are more likely than females to use ECs and tobacco cigarettes (Baiya *et al.*, 2020; Gold *et al.*, 1996; Soule *et al.*, 2015; Goniewicz and Zielinska-Danch, 2012;

Lee *et al.*, 2014; El-AminSel *et al.*, 2011). The present study also found that students who had previously smoked tobacco were more likely to use ECs. This aligns with a previous study in Canada, which found that 34.5% of adolescent EC users had previously smoked tobacco cigarettes, and only 5.2% of EC users had not participated in smoking behaviors before using ECs (Czoli *et al.*, 2014). It is possible that tobacco smokers generally have positive attitudes toward ECs and are interested in trying a new smoking product. For instance, students believed that EC use could aid smoking cessation. Additionally, EC use among current smokers can be due to EC use being cheaper than conventional cigarette usage. Students could save the expense of purchasing tobacco cigarettes. It is also possible that smokers just would like to try a new smoking product which is currently popular. Rogers (1962) stated that an individual having prolonged existing behavior tends to adopt the new behavior, which has similar pattern, characteristic, or idea that is widely accepted by social groups.

Finally, friends' recommendation of ECs could also significantly influence students' EC use. This study found that most EC users had friends who smoked. Adolescents' behaviors are strongly influenced by their friends as they spend a great deal of time with their friends and desire the acceptance of their peers. Adolescents may imitate friends' smoking behaviors to gain social acceptance. Currently, it seems that EC use is popular among adolescents, and EC use among adolescents could play a significant role in the overall increase in EC use. For instance, one-fifth of adolescents in Poland have tried ECs (Goniewicz and Zielinska-Danch, 2012). Therefore, more attention to EC use among adolescents is needed as this could significantly increase overall EC use, and communication about the harmful health effects of ECs should be developed especially for adolescents.

In summary, to reduce EC use among university students, students' attitudes towards EC use should be altered by enhancing their knowledge about ECs. Namely, students should be properly educated about the components and potential harmful effects of ECs. Many EC smokers believe that ECs are not harmful and can aid smoking cessation. Furthermore, the Thai government should implement tighter controls over the communication channels used to advertise EC products. So far, no regulations or strategies have been implemented to control advertisements for EC products. Uncontrolled advertising messages from EC producers and frequent EC advertisements on social media can contribute to misconceptions about EC products. Social norms also play an important role in promoting EC use and smoking behaviors among adolescents. Public health policy should target to change public perception on smoking behaviors. Negative social images conveyed by smoking behaviors should be appropriately promoted by the development of public communication strategies. In the same time, other behavior change interventions should be also taken into considerations. Those are such as controlling students' accessibility of EC products and EC use in schools or universities. For instance, spaces in campuses should not be provided in the way that makes EC use or tobacco use more tolerated or enjoyable. Finally, this study also suggests that EC use among university students, particularly male students, could be critical because adolescent smokers could motivate other students to initiate EC use.

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About the authors

Surapong Chudech is an assistant professor of Social Sciences at King Mongkut's University of Technology Thonburi (KMUTT), Bangkok City, Thailand. His work focuses on health psychology and education, behavioral change, and smoking behaviors.

Piyapong Janmaimool is an associate professor of Environmental Education at King Mongkut's University of Technology Thonburi (KMUTT), Bangkok City, Thailand. He is also an assistant dean for research of School of Liberal Arts. His work centers on environmental risk communication, environmental education, environmental management policies, environmental conservation, and urban studies. Piyapong Janmaimool is the corresponding author and can be contacted at: tum16615@hotmail.com