e-ISSN: 2654-9325
p-ISSN: 2715-9965

JURNAL BIDAN CERDAS

Volume 5 Nomor 4, 2023

Accredited SINTA 2

Editor in Chief:

Sumiaty, SST., MPH.

Diterbitkan atas Kerjasama
Jurusan Kebidanan Poltekkes Kemenkes Palu
dengan Pengurus Pusat Ikatan Bidan Indonesia (PP IBI)

INDEXING:

Dimensions, sinta S2, GARUDA, Google Scholar

Jurnal Bidan Cerdas
e-ISSN: 2654-9352 dan p-ISSN: 2715-9965
Volume 5 Nomor 4, 2023, Halaman 156 – 165
DOI: 10.33860/jbc.v5i4.2339
Website:https://jurnal.poltekkespalu.ac.id/index.php/JBC
Penerbit: Poltekkes Kemenkes Palu

Exploring Adolescent Pregnancy Expectations in Continuity of Midwifery Care: A Qualitative Study in Indonesia

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ARTICLE INFO

Article History:

Received: 2023-06-05
Accepted: 2023-11-28
Published: 2023-12-07

Keywords:

adolescent pregnancy;
continuity of midwifery care;
expectation;
Indonesia.

ABSTRACT

Introduction: Adolescent pregnancy presents a significant challenge to global reproductive health, including in Indonesia. The unique obstacles that young pregnant women encounter when seeking appropriate and supportive healthcare services call for a deeper understanding to improve maternal care. **Purpose:** This study aims to explore the expectations of young pregnant women regarding continuous midwifery care in Indonesia. **Method:** This research employed an exploratory qualitative approach, conducting 13 face-to-face interviews between January and June 2022. Participants included midwives, young mothers, a coordinating midwife, and Mother and Child Health (MCH) program holders. Interviews, lasting 1-1.5 hours, were conducted, and the interview data were rigorously analyzed thematically by the research team, strengthening data reliability through triangulation. **Results:** Continuity management emphasizes friendly service, privacy, clear communication, and comprehensive health assessments. Informational continuity involves comprehensive information, direct communication, attractive aids, and health education evaluation. Relational continuity highlights comprehensive maternal care, family tradition approval, reminders, and efficient care. The study underscores the importance of tailored, holistic, and culturally sensitive midwifery care for young pregnant women's overall well-being. **Conclusion:** This study highlights adolescent pregnant women's unique needs, focusing on continuity management, informational continuity, and relational continuity. Proposed strategies include tailored health services, comprehensive maternal education, cultural sensitivity training for healthcare providers, policy integration, and diverse research. Successfully implementing these measures can significantly enhance maternal care outcomes for Indonesian adolescents.

INTRODUCTION

Adolescent pregnancy is a serious public health issue in low- and middle-income countries. Approximately 21 million girls aged 15 to 19 and 2 million girls under the age of 15 experience pregnancy each year in developing countries (Manhica et al., 2021; Musinguzi et al., 2022; WHO, 2017). The maternal mortality rate is estimated to be three times higher for ages 15-19 compared to women aged 20-24 (Akseer et al., 2022; Sewpaul, Crutzen, Dukhi, Sekgala, & Reddy, 2021). Adolescent pregnancy increases the risk of obstetric complications, gestational diabetes, anemia, hypertension disorders during pregnancy, and concurrent diseases compared to adult women (Govender, Taylor, & Naidoo, 2020). It is also associated with the risk of premature birth, low birth weight, infant mortality, and respiratory problems (Kemenkes RI, 2022).

In the context of Indonesia, the prevalence of adolescent pregnancy raises serious concerns. Many adolescent pregnancies resort to unsafe abortion methods, leading to complications such as pregnancy-related hypertension, endometriosis, and eclampsia, making unsafe abortion a primary cause of death among adolescent pregnancy (Akseer et al., 2022; Jahdi et al., 2019). Research indicates that infants born to mothers under 20 years old face a high risk of premature birth, low birth weight, congenital abnormalities, fatal neonatal issues requiring intensive care, and a high likelihood of death within the first seven days of life (Hackett et al., 2019). Within the Association of South East Asian Nations (ASEAN) region, Indonesia consistently holds the second-highest rate of adolescent pregnancies (Karaçam, Kizilca Çakaloz, & Demir, 2021). In Indonesia, 45.10% of first-time pregnant women are under 20 years old, with the percentage being 33.7% in West Sumatra. Moreover, the highest percentage of women under 20 receiving pregnancy care support is in Padang City, reaching 23.06%, followed by Padang Panjang City (20.45%), Bukittinggi City (19.28%), and Pariaman City (15.37%) (Kemenkes RI, 2022).

In addition to health risks, adolescent pregnancy faces social stigma and societal barriers. The social stigma surrounding adolescent pregnancy results in feelings of isolation, decreased self-esteem, and difficulties in seeking the necessary support and healthcare services (A.W Astuti, 2018; Jittitaworn, Fox, Catling, & Homer, 2020; Sewpaul et al., 2021). The current healthcare landscape remains insufficient in addressing the unique needs of adolescent pregnancy. The absence of an approach tailored to the nuances of adolescence, coupled with a lack of emotional support and adequate information, poses challenges in midwifery services (Cibralic et al., 2023; Rayment-Jones, Silverio, Harris, Harden, & Sandall, 2020).

This research aims to explore the expectations held by adolescent pregnancy regarding the continuity of midwifery care. This focus is significantly important as it enables a better understanding and proactive addressing of the obstacles they encounter (UNICEF & UNFPA, 2023). Through an in-depth comprehension of the perspectives and aspirations of these young women, healthcare providers, policymakers, and researchers can collaborate to shape services that are not only supportive and informative but also tailored to the unique needs of pregnant young women. The collective aim is to have a positive impact on the holistic well-being of both pregnant young women and unborn children while simultaneously working to eliminate the stigma associated with adolescent pregnancy.

METHODS

This research adopts an exploratory qualitative approach guided by the theoretical concept of the Midwifery Care Continuity pyramid proposed by Sandall, (2017), which encompasses continuity in management, information, and relationships. The chosen design aims to delve into the expectations of young pregnant women regarding continuous midwifery care, utilizing in-depth interviews as the data collection method. The study was conducted in Padang City in June 2022, involving 4 independent practicing midwives, 5 young mothers, 1 coordinating midwife, and 3 individuals responsible for the Mother and Child Health (MCH) program at the local health center as participants. The primary instrument for qualitative research was the researcher herself, and the facilitating researchers were midwives with a Master's degree in Midwifery.

Qualitative data collection involved in-depth interviews using tools such as a voice recorder, camera, and writing instruments. The lead researcher, a midwife with a Master's degree in Midwifery, acted as the facilitator. The interviews followed a prepared guide to ensure comprehensive coverage of the topics. Sample selection utilized purposive sampling, choosing participants based on characteristics and experiences relevant to the research topic. The sample included 4 independent practicing midwives, 5 young mothers, 1 coordinating midwife, and 3 MCH program holders. While purposive sampling provides rich and in-depth information, it introduces the potential for selection bias.

Participants were intentionally recruited based on their relevance to the research topic. Inclusion criteria ensured their direct involvement or experience with midwifery care for teenage pregnancies. However, it is acknowledged that this method may introduce bias as participants were not randomly selected. The determination of the sample size was based on achieving saturation, where no new information or themes emerged from the data. A total of 13 face-to-face in-depth interviews were conducted, involving midwives, young mothers, coordinating midwives, and MCH program holders.

In-depth interviews, conducted between January and June 2022, lasted approximately 1-1.5 hours per session. The interview guide comprised open-ended questions exploring participants' experiences, expectations, and challenges related to the continuity of midwifery care for teenage pregnancies. Interviews were conducted at participants' homes, in both the Indonesian and local languages, to ensure clarity and depth. To enhance the validity and reliability of the data, a rigorous data analysis process was employed. Thematic analysis was collectively conducted by the research team, involving the re-reading of transcripts and the development of analytical categories. This triangulation approach ensured the reliability of the qualitative data.

RESULT

The characteristics of the informants in this study are as follows in Table no 1.

Table 1. The characteristics of the informants

No.	Informant Code	Informant	Ages (Years)	Education Level	Job
1.	01a	Midwife 1	55	Diploma-III	Retired civil servants
2.	01b	Midwife 2	56	Diploma-III	Civil servants
3.	01c	Midwife 3	54	Magister	Civil servants

No.	Informant Code	Informant	Ages (Years)	Education Level	Job
4.	01d	Midwife 4	65	Diploma-IV	Retired civil servants
5.	02a	Midwife in charge of MCH 1	35	Diploma-IV	Civil servants
6.	02b	Midwife in charge of MCH 2	36	Diploma-IV	Civil servants
7.	02c	Midwife in charge of MCH 3	40	Diplom-IV	Civil servants
8.	03a	Cordinating Midwife	39	Diploma-III	Civil servants
9.	04a	Young Pregnant women 1	19	Junior High School	Housewife
10.	04b	Young Pregnant women 2	19	Junior High School	Housewife
11.	04c	Young Pregnant women 3	18	Junior High School	Housewife
12.	04d	Young Pregnant women 4	19	Elementary School	Housewife
13.	04e	Young Pregnant women 5	17	Junior High School	Housewife

Through the voices of the informants, this qualitative study illuminates the multifaceted expectations of young pregnant women regarding continuous midwifery care. The research delved into three essential dimensions: continuity management, informational continuity, and relational continuity. These dimensions were explored through the direct expressions of the participants, offering intricate insights into their experiences and expectations.

Dimension of Continuity Management

Table 2. Triangulation Matrix of Expectations of Young Pregnant Women Regarding Continuous Midwifery Care in the Dimension of Continuity Management

No.	Theme	In-depth Interview	Conclusion
1	Data Collection	a. Friendly service	"Expectation: A friendly and gentle assessment for comfort."
		b. Examination in a curtained room	"Ensuring privacy and safety for the mother during examinations."
		c. Clear communication of goals and results	"Clear communication regarding the purpose and results of the examination."
		d. Adequate time with the mother	"Providing sufficient time to listen to the mother's complaints."
2	Data Interpretation	- Results communicated in an understandable manner	"Expectation: Detailed and clear communication of diagnosis."
3	Care Planning	- Care plan involves counseling, medication, and vitamins	"Mother's expectation: Care plan in line with examination results and appropriate health education."
4	Care Implementation	- Care involves counseling, medication, and vitamins	"Expectation: Implementation of care that can address complaints and provide continuous health monitoring."

No.	Theme	In-depth Interview	Conclusion
5	Care Evaluation	- Questions about previous complaints revisited	"Expectation: Evaluation by revisiting previous complaints during follow-up visits."

Health Assessment: A common theme emerged around the desire for comprehensive yet sensitive health assessments. As one informant articulated, "Only check the important things so that we are not embarrassed or uncomfortable (Informant 04b)." This aspiration reflects a quest for thorough examinations that also prioritize emotional well-being. Communication of Health Issues/Diagnosis/Conditions: Clarity in communication and comprehensive understanding of health-related matters surfaced in the words of an informant, "More in-depth counseling about what the complaint is and an explanation of the examination results (Informant 01b)."

Appropriateness of Care Plans: The significance of well-suited care plans was highlighted by an informant's words, "Getting the best service, which makes you comfortable. The young pregnant woman wants her complaints to be heard by the midwife, she is very happy when we pay attention to her, so we hope that we will pay more attention (Informant 02c)." Implementation and Evaluation: Emphasis on ongoing monitoring and evaluation of care came through, as one informant stated, "Ask for complaints again on the previous visit, hoping that the complaints will go away if they are still felt a solution will be given to overcome them (Informant 01a)."

Table 3. Dimension of Informational Continuity

No.	Theme	In-depth Interview	Conclusion
1	Types of Health Information	Comprehensive information on various aspects	"Expectation: Young pregnant women expect to receive comprehensive information, including maintaining a healthy pregnancy, childbirth, and preparing for parenthood.
2	Method of Information Delivery	Direct oral communication (04b, 04c, 04d, 04e)	"Expectation: Young pregnant women prefer to receive information directly with the possibility of discussion and contact via WhatsApp/phone if needed.
3	Information Delivery Media	Using the MCH book, hoping for more detailed, simple, attractive aids (04a, 04b, 04c, 04d, 04e)	Young pregnant women hope midwives use media that are attractive, simple, comprehensive, easy to understand, and portable.
4	Evaluation and Follow-up	- Insights increase after using visual aids, complaints decrease (04a, 04c, 04d, 04e)	"Expectation: Young pregnant women hope midwives evaluate health education by asking again during the next visit.

Information Needs: Young pregnant women sought a deeper understanding across various aspects of maternal health. An informant expressed, "Pregnant women hope to enjoy their pregnancy by getting education on patterns of sexual relations, the need for rest, knowledge about amniotic fluid, nutritional information, danger signs of pregnancy, preparation for delivery, and use of family planning (Informant 04b)."Health Education Method: The importance of interactive and engaging health education methods was stressed by an informant, "Information during pregnancy, overcoming labor pain, baby health (Informant 01a)."

Preferred Health Education Media: The desire for diverse educational resources beyond traditional tools was captured in the words, "We need other book media that can help add to the lack of information in the MCH handbook (Informant 02b)." Evaluation of Health Education: The call for post-education assessments was echoed, "We need media or tools other than the MCH handbook that can answer all the complaints of pregnant women (Informant 01a)."

Table 4. Dimension of Relational Continuity

No.	Theme	In-depth Interview	Conclusion
1	Comprehensive Maternal Care	a. Comprehensive services provided include addressing complaints, check-ups, fetal monitoring, hygiene, family planning (04a, 04b, 04c, 04d, 04e) b. Midwives approve or disapprove of family traditions, providing explanations if they conflict with health (04c, 004d, 04e) c. Midwives remind for follow-up visits (04c, 04d) d. Continuous care from pregnancy to family planning (04b, 04c, 04d, 04e)	Adolescent pregnancy Expectation: 1. Adolescent pregnancy expect Comprehensive, comfortable, satisfying care 2. Understanding and respect for their values and culture. 3. Family support throughout the process
2	Effectiveness of Care	a. Met expectations; all MCH book data asked (04a, 04e) b. Services align with expectations; need tools for more information (04a, 04b, 04c, 04d, 04e)	Adolescent pregnancy expects midwives to: 1. Collect comprehensive data. 2. Provide the latest, complete information. 3. Offer efficiency beyond routine MCH book information.
3	Efficiency of Care	a. Sufficient time (15-20 mins) (04a, 04b, 04c, 04d, 04e) b. Complete resources, friendly midwives, close distance (04a, 04b, 04c, 04e)	Pregnant young women expect: 1. Sufficient time for comfortable discussions. 2. Easy access to ultrasound services. .
4	Safety of Care	a. Examinations in a special room; if not, close the door and curtain (04a, 04b, 04c, 04d, 04e) b. Handwashing, gloves, masks (04a, 04c, 04d, 04e)	Pregnant young women expect midwives to: 1. Maintain privacy and confidentiality during examinations. 2. Adhere to infection prevention measures.

Comprehensive Care: An informant conveyed the importance of holistic care that aligns with young pregnant women's needs, stating, "Perfect match (Informant 04c)." Cultural Understanding: The need for culturally sensitive care that respects individual beliefs and practices was emphasized, "Appreciated, understood, and we approve. Of course, their expectations are influenced by the culture and knowledge of their parents (Informant 01c)."

Involvement and Continuity: The desire for continuous engagement and support from midwives was evident, "It is hoped that the midwife's control will be further improved, starting from pregnancy to delivery and also the family planning plan

(Informant 04e)." Effective and Efficient Care: Effective communication and timely provision of relevant information were seen as crucial, "Complete data information in the MCH handbook or on the pregnant woman's status sheet, as well as the information provided according to the mother's needs (Informant 03a)."

Privacy and Safety: Balancing privacy, confidentiality, and quality care emerged as a concern, "Mother, I hope the secret will be kept secret, our door will be closed during the examination, Mother will tell you personally if you want (Informant 01a)." Through the informants' narratives, this study weaves a tapestry of expectations, underscoring the importance of tailored, holistic, and culturally sensitive midwifery care. This approach is essential for addressing the needs and aspirations of young pregnant women, ultimately contributing to their overall well-being and positive maternal experiences.

DISCUSSION

The findings of this research offer profound insights into the expectations and needs of adolescent pregnancies regarding continuous midwifery care in Indonesia.

Management Continuity

The emphasis on sensitive and high-quality health assessments for adolescent pregnancies indicates the need for improvements in adolescent-friendly healthcare services (Erasmus, Knight, & Dutton, 2020; Hackett et al., 2019). Adolescent-friendly health services have demonstrated a positive impact on increasing the involvement of adolescent pregnancies in maternal healthcare. This underscores the necessity of adjusting healthcare approaches to meet the specific needs of adolescents, taking into account the local social and cultural context in Indonesia.

Informational Continuity

The importance of informational continuity emerges as a critical factor in the care of adolescent pregnancies (Shatilwe, Hlongwana, & Mashamba-Thompson, 2022). The urgent need to provide accurate and relevant information suggests the necessity for improvements in communication strategies. It is recommended that information be delivered in a specific and targeted manner, addressing issues such as gender equality, domestic violence, childbirth readiness, and other relevant aspects (Sandall, 2017). This targeted approach is expected to enhance the understanding and engagement of adolescent pregnancies in their care.

Relational Continuity

The significance of a continuous relationship between adolescent pregnancies and healthcare providers is highlighted as a key factor (Astuti, Hirst, & Bharj, 2020). Effective communication and the establishment of positive trust are identified as crucial elements that can have a positive impact on the overall quality of maternal care. Therefore, it is essential to emphasize the importance of building strong relationships between healthcare providers and adolescent pregnancies to ensure effective and continuous care.

In the context of international comparisons, these findings align with the study by D. Govender et al. (2020) in South Africa, which emphasizes the need for responsiveness to the cultural and social values of adolescent pregnancies in maternal care (Govender, Naidoo, & Taylor, 2020; Govender, Taylor, et al., 2020). The implications drawn from these findings are that in developing effective maternal care, healthcare providers in Indonesia need to consider the cultural and social diversity of

adolescent pregnancies. In the context of adolescents' expectations regarding culture, the results of this study can serve as a foundation to better understand how cultural norms influence the expectations and needs of adolescent pregnancies. Early marriages and pregnancies, conflicting with injunctive and descriptive cultural norms, may reflect a shift in adolescent values related to marriage and pregnancy. Therefore, it is essential to consider how cultural influences can be integrated into more effective maternal care strategies (Maly et al., 2017).

In a policy context, this research suggests the need for specific and targeted models of continuous midwifery care for adolescent pregnancies, developing maternal care strategies focused on the specific needs of adolescent pregnancies rather than generalized maternal care (Erika, 2019). The integration of adolescent-friendly healthcare services, the provision of more specific information tailored to their needs, and increased training for healthcare providers could enhance the quality of care and engagement of adolescent pregnancies (Susanti et al., 2022).

Despite offering valuable insights, it is important to acknowledge several limitations. The limited sample coverage in a specific region may restrict the generalization of these findings to the entire population of adolescent pregnancies in Indonesia. Therefore, further research with a more representative sample across different regions of Indonesia is needed to validate and expand these findings. For future research, it is recommended to explore the potential impact of the proposed care strategies and measure their effectiveness in improving maternal health outcomes among adolescent pregnancies in Indonesia. Comparative research that compares these findings with existing literature can provide a deeper understanding of the local context and global variations in maternal care.

CONCLUSION AND RECOMMENDATION

In conclusion, this study provides profound insights into the expectations of adolescent pregnant women regarding continuous midwifery care in Indonesia. The three identified dimensions—continuity management, informational continuity, and relational continuity—underscore the critical aspects that need attention to cater to the unique needs of this demographic. The emphasis on sensitive health assessments highlights the importance of prioritizing emotional well-being and personalized care plans for adolescent pregnant women. Continuous evaluations and monitoring throughout the maternal journey are crucial to address the evolving needs of this specific group. The significance of informational continuity brings attention to the demand for diverse maternal health information, interactive education, and culturally sensitive care. Tailoring health services to meet these specific needs is imperative for ensuring the well-being of adolescent pregnant women. The importance of relational continuity stresses the need for trustworthy relationships between healthcare providers and adolescent pregnant women. Culturally attuned support, effective communication, and mutual trust are identified as key elements for ensuring a positive impact on the overall quality of maternal care.

The recommendation from this study; Healthcare systems should prioritize the development of tailored health services that address the unique needs of adolescent pregnant women. This includes implementing sensitive health assessments, continuous monitoring, and personalized care plans.There is a need for comprehensive maternal health education that is interactive, culturally sensitive, and addresses the diverse informational needs of adolescent pregnant women. Educational resources should cover a range of topics, including gender equality, domestic violence, childbirth preparedness, and other relevant aspects. Healthcare

providers should undergo cultural sensitivity training to ensure that they can offer culturally attuned support to adolescent pregnant women. This training should emphasize effective communication and the building of trustful relationships. Policymakers should integrate the identified dimensions of continuity management, informational continuity, and relational continuity into maternal care policies. This integration will contribute to creating a healthcare environment that meets the expectations and needs of adolescent pregnant women.

Future research should involve a more diverse participant pool to ensure a comprehensive understanding of the expectations and needs of adolescent pregnant women. This will contribute to the development of more targeted and effective maternal care services. By implementing these recommendations, healthcare systems and policymakers can work towards redefining continuous midwifery care to better suit the expectations of adolescent pregnant women in Indonesia, ultimately improving maternal care outcomes for this specific demographic.

ACKNOWLEDGEMENT

We extend our sincere gratitude to all the participants who graciously contributed to this study. Your active engagement and valuable perspectives have significantly enriched the depth and quality of our research. We deeply appreciate your invaluable participation.

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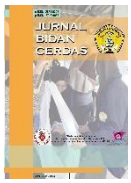
Jurnal Bidan Cerdas
e-ISSN: 2654-9352 dan p-ISSN: 2715-9965
Volume 5 Nomor 4, 2023, Halaman 166 – 173
DOI: 10.33860/jbc.v5i4.3012
Website:https://jurnal.poltekkespalu.ac.id/index.php/JBC
Penerbit: Poltekkes Kemenkes Palu



Marriage Readiness Cards and Adolescent Knowledge: Addressing Child Marriage

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ARTICLE INFO

Article History:

Received: 2023-09-08
Accepted: 2023-12-20
Published: 2023-12-31

Keywords:

Marriage Readiness cards;
Adolescent;
Knowledge

ABSTRACT

Introduction: Child marriage is a concerning issue associated with various health and social problems, including stress, suicide, despair, low self-esteem, family and social difficulties, limited job choices, financial dependence, and school dropout. **Objectives:** This study determined the relationship between marriage readiness cards and the improvement of adolescent knowledge in unraveling child marriages. **Methods:** The research utilized a cross-sectional design conducted at the adolescent health post within the Pantoloan Community Health Center's working area in July 2023. Purposive sampling involved 36 respondents, and data collection utilized a 10-question questionnaire. Univariate and bivariate analyses (Wilcoxon) were applied to the collected data, presented through tables and narrative descriptions. **Results:** The research findings indicated a significant improvement in adolescent knowledge after the intervention, as evidenced by a negative rank of 0 and a positive rank of 5, with a statistically significant p-value of 0.000. **In conclusion,** engaging educational media, such as marriage readiness cards, proved effective in enhancing respondents' knowledge. This study recommends community health centers to adopt educational media that capture adolescents' attention for more impactful health promotion initiatives.

INTRODUCTION

Adolescence is a transitional period from childhood to adulthood, during which adolescents begin to focus on behaviors associated with adulthood, such as sexual needs (Fatmawaty, 2017). Therefore, issues such as premarital sex often arise during adolescence, which could increase the risk of sexually transmitted infections (Majumdar, 2018) and unwanted pregnancies that lead to abortions or child marriages (Zenebe & Haukanes, 2019). Anticipating such situations, and providing accurate information is crucial to ensure that adolescents do not misinterpret their adulthood (Fatmawaty, 2017). The prevalence of child marriage in Indonesia was approximately 1,220,900 in 2018. This placed Indonesia among the top 10 countries with the highest absolute number of child marriages worldwide. The Indonesian government's target was to reduce the percentage of child marriages to 8.74% by 2024 and 6.94% by 2030.

Child marriage was associated with an increase in difficulties performing daily activities, giving birth at a young age, experiencing stress (de Groot, Kuunyem, & Palermo, 2018), Experiencing mental and physical health issues such as suicide,

despair, and low self-esteem (Aggarwal, Francis, Dashti, & Patton, 2023; Burgess, Jeffery, Odero, Rose-Clarke, & Devakumar, 2022), Family and social difficulties, limited job choices, financial dependence, and dropping out of school, as well as the risk of social isolation and higher stress related to parental responsibilities and marriage (Nabila, Roswiyani, & Satyadi, 2022; Yoosefi Lebni, Solhi, Ebadi Fard Azar, Khalajabadi Farahani, & Irandoost, 2023).

Provinces with the highest prevalence of child marriage were Central Sulawesi, West Sulawesi, and Southeast Sulawesi (Badan Pusat Statistik, 2020). The government's strategy to reduce the prevalence of child marriage included increasing children's knowledge, creating environments supportive of preventing child marriage, enhancing flexibility and expanding services, strengthening regulations and institutions, and improving coordination (Kementerian PPN/ Bappenas, 2020). Pantoloan Community Health Center, one of the health centers in the city of Palu, had the highest rate of child marriage in Palu. Data obtained from the annual report of Pantoloan Community Health Center indicated that the number of child marriages in 2020 was 40 individuals, in 2021 it was 30 individuals, while in 2022, there were 32 individuals who experienced child marriage.

Aligned with the theories and strategies implemented by the government, this research provided Health Education using a card-based medium called the "marriage readiness card." The marriage readiness card was created inspired by a card game found on the computer called "spider solitaire" and then modified to suit the research needs. The marriage readiness card contains information about preparations before marriage, particularly related to reproductive health. The content on the marriage readiness card includes information about the ideal age for marriage for both females and males, recommended health check-ups before marriage, decision-making about marriage, the ideal age for having the first child for both females and males, decision-making regarding the number of children, and the spacing between two pregnancies. The card is designed attractively using color gradients, animated images, and engaging fonts for the provided information. Each complete set of information shares the same color design. This card is still in the initial design stage, and its use is manual. Based on this, the research aimed to determine the impact of the marriage readiness card on the improvement of adolescent knowledge to prevent child marriages.

METHODS

This research employed a cross-sectional design conducted at the adolescent health post in the working area of Pantoloan Community Health Center in July 2023. The population for this study comprised all adolescents in the working area of Pantoloan Community Health Center, and the sample was selected using purposive sampling. Using a formula for an unknown population, the sample size was calculated to be 32.5, and with a 10% dropout anticipation, the total sample size obtained was 36 samples. The inclusion criteria for this study were adolescents who were unmarried and within a certain age range. The exclusion criteria were adolescents who had been pregnant before. Data were collected using a questionnaire adopted from the 2017 Indonesia Demographic and Health Survey (IDHS) questionnaire, specifically Part 14 regarding marriage and children. The questions were closed-ended, with two answer options (incorrect and correct). Each incorrect answer was coded as "0," and each correct answer was coded as "1," using a nominal measurement scale. The variables in this study were divided into two categories: the independent variable was the respondents' level of knowledge, and the dependent variable was the marriage readiness card.

The marriage readiness card contains explanations about the ideal age for marriage for both females and males, recommended health check-ups before marriage, decision-making about marriage, the appropriate age for having the first child, and the spacing between two children. The method of using the marriage readiness card involves dividing adolescents into small groups of 2 to 4 individuals per group. Each person is given four cards, and the game begins by mentioning a keyword. The participants then complete the mentioned keyword using the pieces found on each card until it forms complete information. The adolescent who finishes first by collecting all the information pieces becomes the winner. The design of this card can be viewed at the following link https://drive.google.com/file/d/13Ye6ipkCdu2qXTEkefgN6bgPLnC5cEXG/view?usp=sharing.

Data collection was conducted at three adolescent health posts in the working area of Pantoloan Community Health Center, and the respondents were adolescents aged 10 to 17 years. Questionnaires were distributed before the marriage readiness card game (pre-test). Afterward, the game lasted for 20 minutes, followed by a 10-minute break. Subsequently, the same questionnaire was redistributed (post-test). Both variables were tested univariately and bivariately, and the statistical relationship between the two variables was examined using the Wilcoxon test. The research results were presented in table form and described narratively. This study adhered to the ethical code issued by the research ethics commission of Poltekkes Kemenkes Palu with the number 0035/KEPK-KPK/III/2023.

RESULTS

Data collection was conducted in the working area of Pantoloan Community Health Center, integrated with three adolescent health posts, namely Baiya, Pantoloan Boya, and Lelea, in July. The sample size consisted of 36 adolescents, both males and females. The research findings, after data processing and analysis, revealed the characteristics of the respondents in terms of age and gender.

Table 1 Distribution of Respondent Characteristics Based on Age and gender

Variables	n	%
Age		
Early adolescence (10–12 years)	26	72.2
Mid-adolescence (13–17 years)	10	27.8
Gender		
Male	8	22.2
Female	28	77.8

The results of univariate analysis of respondent frequencies based on age showed that 26 respondents (72.2%) were early adolescents with an age range of 14–17 years. The remaining 10 respondents (27.8%) were mid-adolescents with an age range of 13–17 years. Regarding the frequency distribution based on gender, there were 8 male respondents (22.2%) and the remaining 28 respondents (77.8%) were female.

The following presents the results of data processing in the form of an overview of respondents' knowledge before and after the intervention through health education about marriage preparation using promotional media (marriage readiness cards). The results of the frequency distribution of respondents' knowledge before and after the intervention are as follows:

Table 2. Frequency distribution of respondents before the intervention

Question	Pre - Test		Post - test	
	n	%	n	%
The appropriate age for planning marriage				
a. ge of females < 21 years or ≥ 35 years; age of males < 25 years	33	91.7	4	11.1
b. Age of females 21–26 years; age of males ≥ 25 years	3	8.3	32	88.9
The appropriate age for females to get married				
a. < 21 years or ≥ 35 years	30	83.3	13	36.1
b. 21 – 26 years	6	16.7	23	63.9
The appropriate age for males to get married				
a. < 25 years	33	91.7	10	27.8
b. ≥ 25 years	3	8.3	26	72.2
Necessary to undergo a premarital check-up:				
a. No	17	47.2	3	8.3
b. Yes	19	52.8	33	91.7
Examinations that had to be done before marriage:				
a. not undergoing an examination or undergoing an incomplete examination	36	100.0	12	33.3
b. undergoing a complete examination (physical, blood, and urine)	0	0.0	24	66.7
Who determined the decision to get married?				
a. Marriage decision, decided by oneself, parents, or other family members	33	91.7	8	22.2
b. The decision to get married was made together	3	8.3	28	77.8
Who determined the number of children?				
a. Decided by the husband or wife alone	22	61.1	5	13.9
b. Decided together (husband and wife)	14	38.9	31	86.1
Ideal age for women to have their first child				
a. < 26 years atau ≥ 35 years	35	97.2	8	22.2
b. 26 – 35 years	1	2.8	28	77.8
Ideal age for men to have their first child				
a. < 35 years	36	100	13	36.1
b. ≥ 35 years	0	0	23	63.9
Ideal spacing between two briths				
a. < 2 years	35	97.2	16	44.4
b. ≥ 2 years	1	2.8	20	55.6

Namely questions 1, 4, and 7. Question 1, which asked about the appropriate age for planning marriage, saw an increase in knowledge from 3 respondents (8.3%) to 32 respondents (88.9%) who answered the age for females 21–26 years and males ≥ 25 years. Question 4, which inquired about the need for a premarital check-up, showed an increase in knowledge from 19 respondents (52.8%) to 33 respondents (91.7%) who chose the answer yes. Question 7, which asked who determined the number of children, showed an increase in knowledge from 14 respondents (38.9%) to 31 respondents (86.1%) who chose the answer decided together (husband and wife). The presented results demonstrate the relationship between the marriage readiness card and the change in the knowledge level of respondents before and after

the intervention. Below are the results obtained after bivariate data processing using Wilcoxon.

Table 3 Distribution of the relationship between marriage readiness cards and the improvement of adolescent knowledge.

	n	*Negative ranks*	*Positif Ranks*	*Ties*	*p-value*
Pre – test	36	0	5	0	<0,001
Post – test	36				

From the results of bivariate analysis, the relationship between the knowledge level of adolescents before and after the intervention (health promotion using the marriage readiness card) obtained a negative rank of 0 and a positive rank of 5, indicating that both groups experienced a change in knowledge level before and after the intervention. Statistically, a p-value of <0.001 was obtained. This indicates the significance of the marriage readiness card educational media in improving adolescent knowledge; thus, the hypothesis is accepted.

DISCUSSION

The research results, through the Wilcoxon test, indicate the influence of health education using the marriage readiness card as a media on improving adolescent knowledge to prevent child marriage. The increase in respondents' knowledge before and after the intervention in this study is evident across all questionnaire items. Furthermore, the analysis results for each questionnaire item show a significant difference between the two groups (pre-test and post-test groups). The knowledge improvement referred to in this study pertains to the respondents' increased awareness regarding marriage readiness, including the ideal age for marriage for both males and females, premarital examinations, decision-making about marriage and having children, the appropriate age for a first child for both males and females, as well as the number of children and the spacing between them. This knowledge is crucial for preventing child marriages.

The findings of this research are consistent with studies stating that adolescents' awareness and perspectives on the age of marriage maturity successfully prevent child marriages (Meilani, Setiyawati, Rofi'ah, & Sukini, 2023). Other studies also indicate that there is a correlation between adolescents' knowledge of the risks of early marriage and their attitudes towards preventing early marriage. The better the level of adolescent knowledge, the more positive their attitudes towards preventing child marriages (Wulandari, Fauziy, & Wardhani, 2023). Similar views were also expressed by those stating that child marriages can be prevented through the increased knowledge of women and families about the dangers of child marriage (Naghizadeh et al., 2021).

A way to improve adolescent knowledge is through health education using engaging educational media, such as artificial intelligence-based modules (Handayani, Nurhayati, & Kamila, 2022), social media platforms such as TikTok, Instagram, Twitter, YouTube, and Facebook (Marlinawati, Rahfiludin, & Mustofa, 2023), and WhatsApp (Yusriani & Acob, 2020). Additionally, the combination of health education and games is more appealing to teenage children as it aligns with their developmental stage. This is supported by several studies indicating that health education based on video games (Havizoh, Widyatuti, & Mulyono, 2022), game-based learning (Lestari & Huriah, 2022),

motoric games and gamification of educational activities (Dos Santos et al., 2023) had positive implications for the improvement of adolescent knowledge.

Child marriage is not caused by a single factor (adolescent knowledge) but can be influenced by other factors such as cultural practices (marriage at a young age), lack of community knowledge related to child marriage, and insufficient access and interest in continuing education. Therefore, preventive efforts involve collaboration among various stakeholders, including parents, village officials, the Office of Religious Affairs, the Ministry of Religious Affairs, the Ministry of Education, and the health department (Latifiani, 2019). Strategies to prevent child marriage emphasize the importance of community involvement, parents, and educational institutions in raising awareness and enhancing knowledge about preventing child marriage (Kementerian PPN/ Bappenas, 2020). Additionally, the role of the government as decision-makers in a country is equally crucial in efforts to prevent child marriage through policy planning and programs at both the national and regional levels (Plesons et al., 2021; Svanemyr, Chandra-Mouli, Raj, Travers, & Sundaram, 2015). Preventing child marriage must be carried out collaboratively through the respective tasks and functions of each party. Increasing knowledge is one form of empowering the community to promote the formation of new behaviors, particularly the behavior of refraining from child marriage, as knowledge plays a crucial role in behavior formation. With the establishment of new behaviors, new habits will develop, eventually leading to the creation of a new culture in society (a culture advocating marriage at the ideal age).

CONCLUSION AND RECOMMENDATIONS

The implementation of educational media in the form of marriage readiness cards significantly improved adolescents' knowledge in preventing child marriage. Health center personnel can effectively apply engaging educational media to help enhance adolescents' understanding of health issues. Further research should explore other aspects of preventing child marriage. Additionally, there is a need for the development of more diverse and varied health education media to determine which educational tools are most effective in improving adolescents' knowledge.

ACKNOWLEDGEMENT

The authors express their gratitude to the Director of the Health Polytechnic of the Ministry of Health in Palu, the Head of the Research and Community Service Center of the Health Polytechnic of the Ministry of Health in Palu, the lecturers, and staff who assisted in the completion of this research. In addition, the authors would like to thank the Pantoloan Health Center for providing the venue for this research.

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Jurnal Bidan Cerdas
e-ISSN: 2654-9352 dan p-ISSN: 2715-9965
Volume 5 Nomor 4, 2023, Halaman 174 – 182
DOI: 10.33860/jbc.v5i4.3086
Website:https://jurnal.poltekkespalu.ac.id/index.php/JBC
Penerbit: Poltekkes Kemenkes Palu

Review of Risk Factors in Breast Cancer Incidence: The Main Role of the Age at First Pregnancy

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ARTICLE INFO

Article History:

Received: 2023-09-18
Accepted: 2023-10-09
Published: 2023-12-31

Keywords:

breast cancer; age at first pregnancy; age at first menstruation; smoking history.

ABSTRACT

Introduction: According to Indonesia's Global Burden Cancer (GLOBOCAN) in 2020, breast cancer accounted for the highest incidence among cancer cases, contributing to 16.6% of the total cases and causing 9.6% of deaths. In 2021, South Jakarta recorded the highest incidence of breast cancer within DKI Jakarta, with 172 cases out of 299. **Objective:** This study aims to identify the dominant factors influencing the occurrence of breast cancer. **Methods:** Employing explanatory research, the study involved 112 respondents selected through accidental sampling. Logistic regression analysis was employed for multivariate analysis. **Results:** The findings revealed three variables with significance levels (Sig.) less than 0.05: age at first menstruation (Sig.=0.005), age at first pregnancy (Sig.<0.001), and smoking history (Sig.=0.018). Exp (B) results indicated that the age of first pregnancy has the greatest impact, with a likelihood 8.6 times higher. **Conclusion:** Consequently, the study concludes that the age of the woman during the first pregnancy emerges as the most dominant factor influencing breast cancer, pointing to the critical period of estrogen exposure. This study underscores the importance of understanding and addressing these factors in breast cancer prevention and intervention strategies, providing valuable insights for public health initiatives.

INTRODUCTION

Breast cancer is the most common cancer in Indonesia, with significant physical, psychological, social, and economic implications. According to the World Health Organization (WHO) Global Burden Cancer (GLOBOCAN) data, breast cancer tops the list of the 10 cancers with the highest global incidence. The other cancers in this list include lung cancer, prostate cancer, colon cancer, stomach cancer, liver cancer, rectal cancer, cervical cancer, esophagus cancer, and thyroid cancer. In 2020, GLOBOCAN reported a total of 2,261,419 new cases of breast cancer worldwide, constituting 11.7% of all cancer cases. Specifically, WHO data indicated that breast cancer is the most prevalent type of cancer, surpassing lung cancer and other forms. The statistics from 2020 further reveal that breast cancer led to 685,000 deaths globally, solidifying its position as the most common cause of death among women and the fifth most frequent cause of cancer-related deaths overall (WHO, 2020a; 2020b).

WHO report in 2020, that the latest cases of breast cancer rank first and the highest incidence is in Africa with 186 thousand cases and 85 thousand causing death. Globally, the highest incidence of breast cancer occurs in Asia as much as 45.4% of all regional regions in the world, followed by Europe with a percentage of 23.5% of all regional regions in the world. Africa is not among the top three highest breast cancer incidence, but Africa is the third regional region that has the highest breast cancer death rate with a percentage of 12.5% of all regional regions in the world after Europe and Asia with percentages of 20.7% and 50.5% of all regional regions in the world respectively (WHO, 2020b).

The *Global Burden Cancer or GLOBOCAN* Indonesia report in 2020 there are 396. 914 new cases and 234,511 deaths. The highest incidence occurred in breast cancer with 68,878 (16.6%) cases with 22,430 (9.6%) mortality rates. Followed by cervical cancer with 36,633 (9.2%) cases with death cases reaching 21,003 (9%) (WHO Indonesia, 2020). The Ministry of Health reports cancer cases in Indonesia at 136.2 per 100,000 people. This figure ranks eighth in Southeast Asia, in Asia, Indonesia ranks 23rd. Of these, the highest incidence of cancer in women is breast cancer cases with an incidence rate of 42.1 per 100,000 people and an average death rate of 17 women per 100,000 people (Ministry of Health of the Republic of Indonesia, 2019).

Based on the results of breast cancer screening with Clinical Examination (SADANIS) in DKI Jakarta Province in 2021, 299 cases of breast lumps were found, and the most were found in South Jakarta with 172 cases, while other regions ranged from 23 to 46 findings (Dinkes DKI, 2022). This research is focused on breast cancer patients by not limiting age, with the hope that the results obtained have a wider spectrum, ranging from pubertal age women and adult women of childbearing age to elderly women (menopause). This study aims to identify the most dominant factors affecting the occurrence of breast cancer.

METHODS

This study employs a quantitative approach with a cross-sectional design, aiming to investigate the correlation between various risk factors associated with breast cancer. The cross-sectional design allows for the examination of these factors simultaneously at a specific point in time. The research was conducted in South Jakarta during the period from March to August 2023. The study population consisted of inpatients at several cancer treatment facilities in South Jakarta.

Accidental sampling was employed as the sampling technique. This method involved selecting breast cancer patients present or encountered by the researcher during data collection. The inclusion criteria encompassed hospitalized breast cancer patients who were married, cooperative, and willing to participate in the research by providing informed consent. The exclusion criteria included outpatient cases and uncooperative cancer patients, particularly those experiencing stress, seizures, or communication difficulties. The final sample size amounted to 112 individuals.

The independent variables encompassed age (categorized as ≥50 years and <50 years), age at first menstruation (categorized as ≥12 years and <12 years), age at first pregnancy (categorized as ≥30 years and <30 years), family history of cancer, history of breastfeeding (categorized as ≥12 months and <12 months), history of hormonal contraceptive use, and smoking history. The dependent variable was the presence or absence of breast cancer. The research instrument employed was a questionnaire, which included inquiries about respondent characteristics and the history of breast cancer.

Bivariate analysis involved the Chi-Square test and Odds Ratio. For multivariate analysis, logistic regression analysis was employed. This study obtained ethical clearance from the Poltekkes Ethics Review Board of the Ministry of Health Tanjung Karang under the reference number 415/KEPK-TJK/VII/2023.

RESULTS

Univariate analyses to explain each characteristic include: Univariate data consisted of: education, occupation, income, cancer stage, age, age at first menstruation, age of first pregnancy, familial breast cancer, breastfeeding, hormonal contraception, and smoking. Respondents totaled 112 people. After the data is analyzed, the following results are obtained:

Table 1. Characteristics of Participants

Variables	Frequency (n=112)	(%)
Education:		
High School	53	47.3
S1 (bachelor's degree)	54	48.2
S2 (master's degree)	5	4.5
Occupation:		
IRT	17	15.2
Merchant	72	64.3
Officer	23	20.5
Income:		
< 5 million	10	8.9
5 - 10 million	24	21.4
> 10 million	78	69.6
Stadium:		
Stadium 2	73	65.2
Stadium 3	39	34.8
Age		
≥ 50 years	73	65.2
< 50 years	39	34.8
First Menstruation		
<12 years	84	75.0
≥12 years	28	25.0
First Pregnancy Age		
≥ 30 years	80	71.4
< 30 years old	32	28.6
Family history of cancer		
None	7	6.3
Exist	105	93.8
History of breastfeeding		
< 12 months	76	67.9
> 12 months	36	32.1
Hormonal Contraceptives		
No	24	21.4
Yes	88	78.6
Smoking/ Passive Smoking		
No	14	12.5
Yes	98	87.5

The distribution of respondents based on their educational background reveals

that 48.2% hold an S1 (bachelor's degree), 47.3% have a high school education, and 4.5% possess an S2 (master's degree). The primary occupation among the respondents is trading, comprising 64.3%, followed by those employed (20.5%) and housewives (15.2%). In terms of income, 69.6% of respondents earn more than 10 million, 20.5% earn between 5-10 million, and 8.9% earn less than 5 million.

Regarding cancer stages, 65.2% of respondents are in stage 2, while 34.8% are in stage 3. The majority of respondents (65.2%) are aged 50 years and above, while 34.8% are below 50 years old. The data on the age at the first menstruation indicates that 75% of respondents had their first menstruation before the age of 12, while 25% experienced it at the age of 12 or older. In terms of the age at the first pregnancy, 71.4% of respondents became pregnant for the first time at the age of 30 or older, with 28.6% having their first pregnancy before the age of 30.

Examining family history, 93.8% of respondents have a family history of breast cancer, while 6.3% do not. Regarding breastfeeding history, 67.9% of respondents breastfed for less than 12 months, and 32.1% breastfed for 12 months or more. In terms of hormonal contraceptive use, 78.6% of respondents have a history of using hormonal contraceptives, while 21.4% do not. Additionally, 87.5% of respondents have a history of smoking, while 15.5% are non-smokers.

Table 2. Bivarate analysis (n=112)

Variables	Breast Cancer				Total		p-*Value*
	No		Yes		n	%	
	n (56)	%	n (56)	%			
Age							
<50 years	37	33.0	32	28.6	69	61.6	0.437
≥50 years	19	17.0	24	21.4	43	38.4	
Age at first menstruation							
<12 tahun	49	43.8	35	31.3	84	75	0.005
≥12 tahun	7	6.3	21	18.8	28	25	
Age at first pregnancy							
<30 years	50	44.6	30	26.8	80	71.4	
≥30 years	6	5.4	26	32.2	32	28.6	0.000
Family history of cancer							
Ada	52	46.4	53	47.3	105	93.8	1.000
Tidak Ada	4	3.6	3	2.7	7	6.3	
History of breastfeeding							
<12 months	33	29.3	43	38.4	76	67.9	0.069
>12 months	23	20.5	13	11.6	36	32.1	
Smoking/ Passive Smoking							
No	54	46.6	42	37.5	92	82.1	0.084
Yes	6	5.4	14	12.5	20	17.9	
Hormonal Contraceptives							
No	40	35.7	48	42.9	88	78.6	0.107
Yes	16	14.3	8	7.1	24	21.4	

Based on the data presented in Table 2, it is evident that out of the 112 respondents, 61.6% were aged below 50 years, while 33% of respondents were not afflicted by breast cancer, and 28.6% had been diagnosed with breast cancer. In the age group of 50 years and above, 38.4% of respondents were identified, with 17% not having breast cancer and 21.4% having a history of breast cancer.

Examining the age at which respondents experienced their first menstruation, 75% of them had their first menstruation before the age of 12. Within this group,

43.8% did not have breast cancer, while 31.3% had been diagnosed with breast cancer. On the other hand, among respondents who experienced their first menstruation at the age of 12 years or older, constituting 25% of the total, 6.3% did not have breast cancer, and 18.8% had a history of breast cancer.

Considering the age of respondents at the time of their first pregnancy, 71.4% experienced their first pregnancy before the age of 30. Within this group, 44.6% did not have breast cancer, while 26.8% had breast cancer. Conversely, among respondents with a first pregnancy at age 30 or older (28.6% of the total), 5.4% did not have breast cancer, and 32.2% had breast cancer.

Analyzing family history, it was found that 93.8% of respondents had a family history of cancer. Among these, 46.4% did not have breast cancer, while 47.3% had breast cancer. For the 6.3% of respondents with no family history of cancer, 3.6% did not have breast cancer, and 2.7% had breast cancer.

Exploring the history of breastfeeding duration, 67.9% of respondents had a history of breastfeeding for less than 12 months. Within this group, 29.3% did not have breast cancer, and 38.4% had breast cancer. For respondents with a breastfeeding duration of 12 months or more (32.1% of the total), 20.5% did not have breast cancer, and 11.6% had breast cancer.

Regarding smoking history, 82.1% of respondents reported no history of smoking. Among them, 46.6% did not have breast cancer, and 37.5% had breast cancer. Conversely, among the 17.9% of respondents with a history of smoking, 5.4% did not have breast cancer, and 12.5% had breast cancer.

In terms of hormonal contraceptive use, 78.6% of respondents reported no history of using hormonal contraceptives. Within this group, 35.7% did not have breast cancer, and 42.9% had breast cancer. Meanwhile, among the 21.4% of respondents with a history of using hormonal contraceptives, 14.3% did not have breast cancer, and 7.1% had breast cancer.

Table 3. Multivariabel analysis (n=112)

Variables	p-value	Exp(B)	95% C.I.for EXP(B)	
			Lower	Upper
Age	0,241	1,8	0,6	4,8
Age at first menstruation	0,005	4,9	1,6	14,9
Age at first pregnancy	0,000	8,6	2,5	28,8
Family history of cancer	0,699	1,5	0,2	11,3
History of breastfeeding	0,798	0,9	0,3	2,4
Smoking	0,018	0,2	0,1	0,7
Hormonal Contraceptives	0,237	1,9	0,6	6,0

Based on the obtained significance values, it is evident that three variables exhibit statistical significance with a significance level (Sig.) of less than 0.05. Specifically, these variables are the age of the first menstruation (Sig. = 0.005), the age of the first pregnancy (Sig. = 0.000), and family smoking history (Sig. = 0.018).

Upon analysis of the odds ratios or Exp (B), it is noteworthy that the variable with the highest odds ratio is the age of the first pregnancy, with a value of 8.6. This suggests that individuals with a later age at their first pregnancy have an 8.6 times higher likelihood of developing breast cancer compared to those with an earlier age at their first pregnancy

DISCUSSION

Association of Age at First pregnancy with Breast Cancer Incidence.

Breast cancer can occur in women whose first pregnancy is after the age of 30 or in women who have never been pregnant. Age at first pregnancy ≥ 30 years risk 2.16 times to develop breast cancer compared to first pregnancy at age <30 years. Breast changes during pregnancy have an effect on the occurrence of breast cancer. The risk of breast cancer decreases with each additional birth. This happens because during the first trimester of pregnancy, estrogen will increase very high. If estrogen is high, it will trigger the multification process of cells to perform mitosis quickly. This triggers the formation of cancer cells in the breast (Clèries et al., 2018). Other studies say that breast cancer risk factors include hormonal factors such as a woman's age during her first menstruation and a woman's age during her first pregnancy putting women in a condition of prolonged exposure to estrogen (Mørch et al., 2017).

Breast cancer occurs through mechanisms related to streroid hormones in the ovaries. First; Natural estrogens (estrogen and estradiol) that are mutagenic and carcinogenic undergo genotoxic processes in the formation of reproductive estrogens and the reaction of quinone estrogen catechoestrogens with DNA. Second; Such events involve the stimulating effects of estrogen and progesterone on cell proliferation in breast tissue, and potentially increase the risk of breast cancer through tumor stem cells in the breast (DeSantis, Ma, Goding Sauer, Newman, & Jemal, 2017).

Women who give birth to their first child at the age of >35 years will experience breast cancer due to the induction of the hormone estrogen. Pregnancy at a younger age decreases hormone receptor positive cells in gene expression and stem cell proliferation. The decline also includes a decrease in regulation and transformation of growth factors. The older a woman is during her first pregnancy, the less protective effect against pregnancy-induced breast cancer. The first parity that occurs after a woman is >35 years old paradoxically increases the risk of breast cancer compared to nullipara women. Early pregnancy decreases the proportion of positive hormone receptor cells and causes changes in gene expression as well as decreased stem cell/progenitor proliferation. These changes include downregulation and transformation of Transforming Growth βFactor β signals. The action of cells in the epithelium of glands in the breast will modulate the risk of breast cancer (Meier-Abt &; Bentires-Alj, 2014).

The results of different studies stated that there was no significant relationship between a woman's age during her first pregnancy and a woman's estradiol levels at childbearing age. The hormone estrogen in breast tissue during pregnancy will have a significant effect on the growth, differentiation and functioning of tissue in the breast (Sari &; Pasalina, 2023). High estrogen levels are also a cause of breast cancer in women until menopause (Ahmed et al., 2018).

Women aged 45 who have never given birth or are nullified have a 0.62% chance of being diagnosed with breast cancer. Women aged 45 years who have given birth have a higher chance of 0.66% being diagnosed with breast cancer within 3-7 years (Ministry of Health RI, 2018).

Childbirth affects breast cancer, especially age, genetic mutations, and family history. But the risk ofbreast cancer after childbirth does not occur instantly. The period of the beginning of the first menstruation and the age of the first pregnancy in women takes a long time. This period of time is thought to be a risk factor for breast cancer because at that time women experience more and longer exposure to estrogen. The hormone estrogen that is long exposed to women can cause the risk of cancer. This is

because the increase in mitosis due to the hormone estrogen triggers tissue proliferation and inhibits *apoptosis. Apoptosis* is the process of tissue death, occurring normally during the process of tissue development and aging in all tissues of the body in this case breast tissue. Mitosis increases gene mutations when DNA replication (D*eoxyribo Nucleid Acid*). Adipose gathering formed from the hormone estrogen will excrete *aromatase* (Fard, Rouhollah, & and Nahid Nafisi, 2018).

Older age in women during the first pregnancy is a risk factor for breast cancer. This is thought to be due to longer exposure to estrogen. So the older a woman is in her first pregnancy, the higher her risk of developing breast cancer. Risk factors for breast cancer due to age during the first pregnancy are factors that can be changed, because it is important for women to get pregnant and give birth at childbearing age or 20-30 years.

The relationship of the age at the first menstruation with breast cancer.

As it is known that women who are exposed to estrogen for a long time are at risk of breast cancer. The menstrual process, the hormone estrogene will increase in the follicular phase and decrease in the luteal phase. This estrogen hormone acts as a carcinogen in the process of increasing the risk of breast cancer. Early menstruation causes the risk of breast cancer. This is because young age causes women to get exposure too quickly to estrogen. Menstruation is a cycle that occurs for 28-35 days. If the menstrual period before the age of 12 years and menopause occurs after the age of 55 years is at risk of exposing women to hormones longer, and at risk of breast cancer (CDC, 2023).

Inline with the results of this study states that there is no association between the age of early menarche and breast cancer. Younger usia during menarche increases the risk of breast cancer twofold (OR, 2.83; 95% CI, 1.02-7.86) (Dati, Sasputra, Rante, &; Artawan, 2021). Similar opinions say that breast cancer is associated with the first menstruation at the age of <12 years, menopausal age >55 years, history of multigravida and history of breastfeeding less than 12 months (Herawati et al., 2022).

Interviews conducted with 90 women showedthat the first menstruation of <12 yearswas associated with breast cancer risk. The incidence of the first menstrual age of <12 years in the case group was 48.9% higher than in the control group of 20.0% (Dewi & Hendrati, 2016).

The age of women during the first menstruation is earlier related to the length of exposure to the hormone estrogen which will affect the process of tissue proliferation including breast tissue. This can eventually lead to breast cancer. So the younger the age a woman has her first period, the higher her risk of developing breast cancer. However, this can be anticipated by improving lifestyle and early detection.

Association of Smoking History with Breast Cancer Incidence.

Smoking behavior in respondents or in their families can have an effect on increasing the risk of breast cancer. Active smoking is associated with an increased risk of breast cancer (Maria, Sainal, &; Nyorong, 2017). Nicotine in tobacco can cause angiogenesis in breast tissue with a mechanism resembling endogenous angiogenesis factor (Agustina, 2022). Other supporting studies state that women who smoke play a role in the incidence of breast cancer (Gaudet et al., 2013). Cigarette smoke contains 20 chemical compounds that induce breast cancer. Some of these compounds are lipophilic, deposited in the adipose tissue of the breast. By epithelial cells milk is metabolized and activated. Women who smoke have detectable metabolites in breast fluid and a higher prevalence of cigarette-specific DNA supplemental products and p53 mutations in breast tissue than nonsmokers. Active

smokers are at risk of lower postmenopausal mammography density and breast cancer effects (Gaudet et al., 2013). Smoking is a factor that can be changed. Smoking is associated with breast cancer. Nicotine triggers angiogenesis in breast tissue.

CONCLUSION AND RECOMMENDATIONS

The most influential factor contributing to breast cancer is identified as the age at first pregnancy. Recommendations for breast cancer prevention efforts include educating women of reproductive age from adolescence onward. Moreover, it is advised to closely monitor factors known to trigger breast cancer, such as the age of the patient, age at first pregnancy, family history of breast cancer, breastfeeding practices, smoking history, and the history of hormonal contraceptive use. Additionally, promoting routine reproductive health check-ups is essential for women at various life stages, including during pregnancy, childbirth, postpartum, and as they age. These comprehensive measures aim to enhance awareness, early detection, and proactive management of risk factors associated with breast cancer among women.

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Jurnal Bidan Cerdas
e-ISSN: 2654-9352 dan p-ISSN: 2715-9965
Volume 5 Nomor 4, 2023, Halaman 183 – 190
DOI: 10.33860/jbc.v5i4.2863
Website:https://jurnal.poltekkespalu.ac.id/index.php/JBC
Penerbit: Poltekkes Kemenkes Palu

The Positive Effect of Counseling about HIV-AIDS in High School

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ARTICLE INFO

Article History:

Received: 2023-08-22
Accepted: 2023-12-04
Published: 2023-12-31

Keywords:

teenager; education; knowledge; HIV/AIDS; high school;

ABSTRACT

Introduction: Adolescents constitute a significant demographic group susceptible to the development of the HIV/AIDS epidemic. The year 2020 witnessed a rise in the number of HIV/AIDS cases, with a notable concentration among individuals aged 20-29 years. Consequently, preventive measures should be targeted towards those under 20 years of age, specifically adolescents. This research aims to identify the impact of health counseling on teenagers' knowledge of HIV/AIDS. **Methods**: The study utilizes a pre-experimental design, specifically a one-group pre-test and post-test design. The sample comprises 90 respondents selected through Simple Random Sampling. The research assesses the average knowledge level of teenagers before and after counseling, utilizing statistical analysis. **Results**: The findings indicate that the average knowledge level of teenagers before counseling is 1.49, whereas the average knowledge level after counseling is 1.94. The statistical analysis, employing the Wilcoxon Signed Rank Test, reveals a significant p-value of <0.001. Conclusion: The research concludes that health counseling has a substantial influence on enhancing teenagers' knowledge about HIV/AIDS. This underscores the importance of implementing targeted health interventions and educational programs to raise awareness and knowledge levels among adolescents, contributing to the overall prevention and control of HIV/AIDS in this vulnerable population.

INTRODUCTION

The global HIV/AIDS epidemic, caused by the Human Immunodeficiency Virus (HIV), poses a significant public health challenge. Particularly affecting vulnerable populations such as sex workers, injection drug users, homosexuals, children born to mothers with HIV/AIDS, and prisoners, these groups are considered at higher risk of HIV infection (Rosmiati et al., 2022). Acquired Immunodeficiency Syndrome (AIDS) manifests as a consequence of decreased immunity due to HIV infection, with the virus targeting cells expressing the Cluster of Differentiation 4 (CD4), especially T lymphocytes (Angel A and Friends, 2022). The increasing prevalence of HIV/AIDS globally is a cause for concern, necessitating effective preventive measures.

World Health Organization (WHO) reports highlight the alarming increase in HIV/AIDS cases, with 2.7 million new HIV infections diagnosed in 2008 and 33.4 million people living with HIV in 2010. By 2022, the number had risen to 35.3 million people

worldwide, with 630,000 deaths reported in the same year (Angel A and Friends, 2022). Notably, HIV-related deaths have reduced by 51% since 2010, demonstrating progress in combating the epidemic (WHO, 2023).

Despite progress, almost half of young people (aged 13-24) with HIV are unaware of their status, emphasizing the need for enhanced testing and prevention efforts (CDC, 2023). Early detection and intervention play a crucial role in connecting youth to appropriate health services and preventing the spread of the virus.

In 2021, an estimated 540 thousand people were living with HIV in Indonesia, representing an increase from 2015. The epidemic in Indonesia is concentrated among key populations, with varying prevalence rates among different groups, such as female sex workers, people who inject drugs, and men who have sex with men (MSM) (Hanadian Nurhayati, 2023). Notably, MSM in Indonesia exhibit a higher HIV prevalence, reaching 30% in some urban centers, underscoring the urgency for targeted interventions (UNICEF, UNPAD, Ministry of Health, 2019).

Furthermore, the issue of narcotics in Indonesia adds complexity to the HIV/AIDS landscape. Agussalim et al (2018) note that the narcotics problem is significant, with approximately 4.7 million people identified as having addictive narcotics. Narcotics use is identified as one of the gateways to HIV/AIDS transmission. Given this context, understanding the impact of health education on adolescents' knowledge about HIV/AIDS becomes crucial. The objective of this research is to assess the effectiveness of HIV/AIDS education on students, contributing to the overall understanding and prevention of HIV/AIDS.

METHODS

Pre-experimental research design using pre-posttest approach in one group (*one-group pre-post test design*). Where is the respondent before given intervention especially formerly done *pre-test*, then after intervention done *post-test*. Testing cause and effect with method compares pre-test results with post-test results. Study was conducted with using questionnaire. The sample is taking students around 90 students by sampling random technique.

The method contains an explanation of the research approach, study subjects, the research procedure's conduct, the use of materials and instruments, data collection, and analysis techniques. The independent variable of this study is health education and the dependent variable is knowledge about HIV/AIDS.

For now, is There is influence counseling health to knowledge teenagers about HIV/AIDS with tool media assistance in the form of containing *leaflets* and *slides/powerpoint* materials about HIV/AIDS in students class X (ten). Moreover, the first shared questionnaire for the circumstances initial (pretest) then carried out counseling health about HIV/AIDS after sharing the same questionnaire (posttest) for now different knowledge after counseling health. The researcher carried out data collection through the questionnaire to each respondent.

Every variable before analyzed, especially formerly done testing normalcy data distribution. Testing this is very important because normal or nope data distribution affects the election presentation of data and the type of test used in hypothesis testing. Normality test distribution on research This use analytical method because more objective compared to plot and histogram methods. The method selected analysis is the Kolmogorov-Smirnov test.

RESULTS

Research results are grouped into 2, namely general data and special data. Which includes general data is demographic data that includes Age, class and type sex. General data is served in the form of a univariate analysis. Which includes special data is the data obtained from answer questionnaire. Specific data is presented in a form analysis bivariate that includes influence between independent and dependent variables.

Table 1. Characteristics Respondents

Variables	n	(%)
Age		
15 years	51	56,7
16 years	36	40.0
17 years	3	3,3
Sex		
Man	39	43.3
Woman	51	56.7

Table 1 above shows that amount sample the most, that are, at the age of 15 years, as many as 51 students (56.7%); aged 16 years, as many as 36 students (40.0%) and aged 17 years, as many as 3 students (3.3%).

Table 2. Distribution frequency based on knowledge *Pre-test* and *Post-test Pre-test*

Variables	Pre-test				Post-test			
	Not enough		Good		Not enough		Good	
	n (46)	%	n (44)	%	n (5)	%	n (85)	%
age								
15	26	51.0	25	49.0	2	3.9	49	96.1
16	17	47.2	19	52.8	3	8.3	33	91.7
17	3	100.0	0	0.0	0	0.0	3	100.0
Sex								
Woman	28	54.9	23	45.1	3	5.9	48	94.1
Man	18	46.2	21	53.8	2	5.1	37	94.9

Table 2 presents the frequency distribution based on pre-test and post-test knowledge for the variables of age and sex. The pre-test and post-test results are categorized into "Not enough" and "Good" knowledge levels.

In the pre-test, 51.0% of 15-year-old participants exhibited “not enough” knowledge, which significantly decreased to 3.9% in the post-test. Conversely, the percentage of participants with "Good" knowledge increased from 49.0% to an impressive 96.1% after the intervention. Among 16-year-old participants, the pre-test indicated that 47.2% had not enough knowledge, experiencing a decrease to 8.3% in the post-test. Simultaneously, the percentage of participants with "Good" knowledge rose significantly from 52.8% to 91.7% after the intervention. Respondents aged 17 years old showed 100% “not enough” knowledge in the pre-test, which further increased to 100% demonstrating "Good" knowledge in the post-test.

In the pre-test, 54.9% of women exhibited “not enough” knowledge, which significantly decreased to 5.9% in the post-test. Simultaneously, the proportion of women with "Good" knowledge rose from 45.1% to a notable 94.1% post-intervention. For men, the pre-test results showed that 46.2% had not enough knowledge, which

decreased significantly to 5.1% in the post-test. Additionally, the percentage of men with "Good" knowledge increased from 53.8% to a remarkable 94.9% after the intervention. These findings collectively suggest a positive impact of the intervention on knowledge levels across different age groups and sex.

Tabel 3. Analysis Influence Health Education Against Knowledge Teenager About HIV/AIDS

	N	Means	std. Deviation	Min	Max	p-value
Pre-Test	90	1.49	0.503	1	2	0.000
Posttest	90	1.94	0.230	1	2	

Source: Primary data, June, 2023 Wilcoxon Signed Rank Test.

From Tabel 3 above illustrates that there are 90 respondents. For category *Pre test* with mark *mean* 1.49, standard deviation value is 0.503, value *min* 1 and value *max* 2 meanwhile for category *posttest* listen mark *mean* 1.94, value standard deviation 0.230, value *min* 1 and value *max* 2. Using *Wilcoxon* test, shows results with mark significance of 0.000 (p <0.05).

DISCUSSION

Based on results research that has done, then is known that out of a total of 90 respondents, knowledge student before intervention in good category as many as 44 respondents, meanwhile knowledge student before intervention in less category as many as 46 respondents. This knowledge respondent Still more many knowledgeable is not enough compared to with the knowledgeable.

From 44 respondents, adolescents / students aged 15 and 16 years knowledgeable Good about HIV/AIDS for men totaling 21 students and girls with a total of 23 students , identified that respondents the Already Once hear or get information good about HIV/AIDS That from television, radio, posters, and other media from NGOs (non-governmental organizations) and the health team others with the knowledge they get since in junior high school form counseling health with get a brochure or *leaflets* and include *powerpoint /slides*, so what ever seen, heard and read by students the will make they get matter new about HIV/AIDS disease, so level knowledge to draft basis of HIV/ AIDS ok . This is in line with theory of Soekidjo Notoatmodjo (2010), knowledge is results sensing man or the result of “knowing ” someone to object through the senses he has. Sensing happen through the senses man namely, the senses sight, hearing, smell, taste and touch. Most knowledge man obtained through the eyes and ears. Knowledge or cognitive is very domains important for formation action someone.

Whereas out of a total of 46 respondents in the category less knowledgeable about HIV/AIDS viz aged 15 to 17 years with amount 18 male students and 28 female students identify which are the respondents not enough information or direct lessons good from party schools, NGOs (Institutions Self-subsistent Community) and the Health Team other nor with source information that can be obtained with *searching* or *browsing* on *the internet* or with through other media such as: television, radio, posters, so that respondents in matter these are teenagers level his knowledge Still belong not enough or No know.

This is in line with theory of Notoatmodjo (2010), who stated that knowledge somebody can influenced by several factor. including experience, level of education, belief, facilities, income, and social. The more Lots experience someone earns from experience Alone, like reading books and other people around him, the broader knowledge the person has. The more Lots facilities as source information such as

radio, television, magazines, newspapers and books so the more knowledge gained.

Counseling health is an activity of education health, which is done to spread messages and embed beliefs so that society does not just know, know, and understand but also wants and can make related suggestions to health (Heni Eka Puji, 2015).This is in line with the theory of Soekidjo Notoatmodjo (2010), which says that Study is something business For obtain things new in Act in demand and covers knowledge, skills, and values with activity mental alone. From the statement, it looked clear that the characteristic typical of the learning process is obtaining something new, the old Not yet there, now become there, the original Not yet known, now known, the first Not yet understand, now understandable. Knowledge of the Finally expected can influence behavior.

However, from posttest results is still found 5 knowledgeable respondents in category not enough that is with age respondents 15 and 16 years, and all respondents aged 17 years has knowledgeable. This caused of level knowledge a person is also affected by age / age, ie the more tall age somebody so the more knowledge is high nor level understanding them, so respondents aged 17 years has own good knowledge after counseling. And also due to ability student or Power reason somebody in accept something information or lesson different so that what one person knows and understands not yet of course also understood by other friends. Then also caused by the respondent the not enough notice during counseling sessions health going on so that still found a number of respondents with level still knowledge belong not enough or still course, no There is enhancement knowledge.

There are several influencing factors development intellect teenager namely: factor hereditary, factor encompassing environment family, environment school and environment community (Gendis 2013). According to Novia Aisyah , 2022 results study prove that size speed processing information correlated positive with IQ score. Speed processing is depending on efficiency genetically controlled neurology and maturation. From corner view This There is proof strong that level intelligence somebody very determined by factor descent.

Reality that children with disabled genetics have an average IQ more low from colleagues those who don't own the same defect (Nur Fauziyah, 2018). Study This is giving proof more carry on about the influence of heredity to intelligence. Since in content, teenagers has own characteristics that determine intellectual performance. Potentially child has bring possibility to become able to think equivalent to normal, above normal or below normal. However, potential will develop or be optimally realized when the environment is not give a chance to grow. Because that is role environment very determines the development intellectual child. A child's intelligence can develop if the environment provides the opportunity to develop optimally. In matters that affect the development of intellect in the environment, among others: Increased information stored (in the brain) of a person so that he is able to think reflectively, lots of experiences solving problems so that someone can think proportionally, there is freedom of thought so that children can solve problems and draw conclusions.

They have got since junior high school (School Intermediate First) through print media as well as electronic media like books, flyers, posters, television, and others so that level his knowledge good before and after intervention/counseling. As well as there are 49 respondents have more knowledgeable before counselling, with exposure material through counseling health with through leaflets and *slides/powerpoint* media regarding HIV/ AIDS explaining what is HIV/AIDS, the etiology or reason of HIV/AIDS, how is HIV/AIDS, transmitted, stages symptom somebody infected with HIV / AIDS, manifestations clinic or signs and symptoms of HIV/AIDS, HIV diagnosis in women and

children, objective from counseling, goals counseling HIV pre -testing, HIV/AIDS prevention, the like how does HIV/AIDS not can caught, and how handling or treatment to HIV/AIDS sufferers. This is because their knowledge get increased ie enhancement knowledge related to respondents with counseling health or interventions that have given.

According to the assumption researcher, enhancement knowledge is wrong teenager only one ie with gift counseling health or education health To use increase knowledge teenagers/students with female students about the draft of healthy sick to something disease. Through counseling health with use some of the media like print media as well as electronic media. electronic media for example counseling with using the presented *slides/powerpoint* media with pictures and colors as well as serve whole points material about draft the basis of HIV / AIDS as well with print media form *leaflet*.

Fill the *leaflet* in accordance with material counseling given with pictures and colors as well as serve whole points material on the leaflet inside questionnaire. Media *Leaflets* and *Slides / Powerpoint* very effective in increasing effectiveness counseling with method lectures, because *leaflet* besides summarizes from whole material counseling, also presents interesting pictures that make it easy somebody understand content material. with knowledge, he will capable sort as well as choose which one is right and which one is wrong, he will not either affected with person other in operate a deed. automatically someone who has own knowledge and familiar For always draw knowledge will easy for him is at in right circumstance. because he know consequence from do something without based on by knowledge, counselling health will give change knowledge for realize degrees optimal health know and get prevent things that can harm health.

However although has own good knowledge , that is No ensure a teenager For No do risky activity infected with HIV/AIDS. Based on assumption on in line with research conducted by Siagian (2012), who examined the Influence Counseling By Executors nutrition with Method Lecture Accompanied by Media Posters and *Leaflets* To Maternal Behavior and Growth Toddler Malnutrition in Tanjung Beringin District, with conclusion that counseling with method lecture accompanied by posters and counseling media with method lecture accompanied by *leaflets* can increase knowledge and attitude Mother toddler.

CONCLUTION

The statistical results show that it has a good influence on the knowledge of teenagers with counseling through education about HIV/AIDS. The research explain well to the community that it is one of the important activitities to increase the understanding about HIV/AIDS to the public especially teenager trough education counseling. The next research may explore much about the benefits of the counseling trough education and another idea to increase the understanding of teenager about HIV/AIDS.

ACKNOWLEDGMENTS

In this research, we would like to express our gratitude to the Director and all Vice Directors of Makassar Health Polytechnic for providing us with the opportunity to conduct this research. We extend our sincere thanks to all participants and enumerators, as their contributions are invaluable to the success of this study.

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Jurnal Bidan Cerdas
e-ISSN: 2654-9352 dan p-ISSN: 2715-9965
Volume 5 Nomor 4, 2023, Halaman 191 – 198
DOI: 10.33860/jbc.v5i4.2995
Website:https://jurnal.poltekkespalu.ac.id/index.php/JBC
Penerbit: Poltekkes Kemenkes Palu

The Effect of Counseling on Postpartum Women's Sexual Satisfaction

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ARTICLE INFO

Article History:

Received: 2023-09-07
Accepted: 2023-12-20
Published: 2023-12-31

Keywords:

counseling; sexual satisfaction; postpartum.

ABSTRACT

Introduction: Only 7–13% of women say they need help or advice to overcome problems regarding sexual satisfaction; 40% of women do not even seek help from a doctor for their sexual complaints. Meanwhile, 54% reported that they only wanted to find a solution to the problem of sexual satisfaction without actually doing it. **Purpose:** to determine the effect of counseling on postpartum women's sexual satisfaction in the Puskesmas Kamonji working area. **Method**: The research was conducted in July–August 2023 with a one-group pretest-posttest design and a sample size of 49 women who had babies aged 2–6 months. Using the Wilcoxon consecutive sampling analysis technique. The results before being given counseling showed that 42.9% of respondents were sexually satisfied, but after being given counseling about sexual satisfaction, 57.3% of respondents felt sexually satisfied (p-value<0.001). **Conclusion:** There is a significant difference in sexual satisfaction before and after providing counseling about sexual satisfaction to respondents. It is recommended that health facilities provide counseling about providing for sexual needs periodically, from pregnancy to the postpartum period, and involve the roles of husband and family.

INTRODUCTION

WHO defines postnatal women's sexual health as "a state of physical, mental, and social well-being about sexuality" (Hababa & Assarag, 2023). Decreased sexual function can occur during pregnancy and childbirth (Malakouti et al., 2020). Sex is an individual's desire to get love and warmth from a partner. This will continue until they provide mutual satisfaction until they reach orgasm (Munthe et al., 2022). The reduction in an orgasm that occurs can reduce satisfaction in sexual intercourse (Chayachinda et al., 2015). Various references state the reasons why sexual satisfaction cannot be achieved. Several children, physiological changes during pregnancy, continuous production of prolactin during breastfeeding, episiotomy (Banaei et al., 2018; Chayachinda et al., 2015; Eid et al., 2015), perineal tears, prolapse, infection, obstetric fistula, female genital cutting, postpartum pain (Banaei et al., 2018; Eid et al., 2015; Wood et al., 2022), uterine prolapse, forced sexual intercourse, sexual violence, and loss of sexual desire/arousal (Ng et al., 2023; Wood et al., 2022), fatigue, how to give birth, urinary incontinence, and depression (Banaei et al., 2018; Eid et al., 2015; Ratnaningsih, 2019; Saotome et al., 2018).

From the information above, only 7–13% said they needed help or advice to overcome problems regarding sexual satisfaction; 40% of women did not even seek

help from a doctor for their sexual complaints. Meanwhile, 54% reported that they only wanted to find a solution to the problem of sexual satisfaction without actually doing it (Eid et al., 2015). If sexual needs are met, the quality of life will be better and the fulfillment of reproductive rights can be achieved (Academy, 2022; Peraturan Menteri Kesehatan Republik Indonesia No. 97 Tahun 2014, 2014). There is also various literature that shows that low sexual satisfaction can cause an imbalance in marriage (Ashdown et al., 2014).

Data in Egypt shows that as many as 83% of women reported sexual problems in the first 3 months after giving birth, whereas at 6 months after giving birth, 18–30% of them still experienced sexual problems, including dyspareunia (Eid et al., 2015). Meanwhile, research in Morocco found that 88.46% of urban people and 79.38% of rural people were dissatisfied with their sexual life after giving birth. There is even research that states that 46.3% of postpartum mothers experience a lack of interest in sexual activity (Hababa & Assarag, 2023). Research on primiparous mothers in Australia, especially those of Asian ethnicity, reported sexual dissatisfaction 3 - 6 months after giving birth (Chayachinda et al., 2015). Some references say the time is between 6 weeks and 6 months after delivery. Especially at 12 weeks after giving birth (Eid et al., 2015). It may even take up to 12 months to return to the level of sexual activity you had before pregnancy (Ng et al., 2023). For Indonesia, the author has not found clear data regarding sexual satisfaction, especially in primiparas.

WHO has recommended integrating sexual issues services into primary care, especially in developing countries (Banaei et al., 2018). This has been continued by the Ministry of Health in the Regulation of the Minister of Health of the Republic of Indonesia No. 97 of 2014. This Minister of Health Regulation has regulated sexual health services that are integrated into health promotion programs, including counseling to provide information about sexual disorders by trained health workers. Sexual health counseling should be carried out during pregnancy check-up visits and childbirth classes to address sexual problems and increase intimacy (Karimi et al., 2021; Wood et al., 2022). Unfortunately, references regarding counseling services related to sexual practices have not been widely discussed (Radziah et al., 2013). Some of these studies include: Research at a health center in Southeast Iran showed that statistically there were significant differences in sexual function between respondents who received counseling and the control group. Sexual satisfaction was measured using a questionnaire (Banaei et al., 2018). Research by Karimi et al., (2021) shows that statistically, counseling can stimulate a woman to open up to her sexual needs so that she can get sexual satisfaction. Counseling also showed a significant difference in sexual satisfaction in postpartum women between those given and not given counseling at the Ardebil Health Center (Malakouti et al., 2020). In other fields, several studies on counseling include research in the Central Java area which obtained significant results that counseling can reduce anxiety in perimenopausal women (Rofi'ah et al., 2019), or research conducted by Herawati et al., (2018) which shows that Family Planning counseling using Family Planning Decision Making Tools (ABPK) for pregnant women is effective in increasing the use of postpartum contraception.

In a preliminary study at one of the PMBs in Puskesmas Kamonji working area for women 3 months postpartum, out of 10 women, 8 women admitted that they felt afraid when they had sexual intercourse for the first time after giving birth. Five women said they felt pain when having sexual intercourse for the first time. Three women mentioned occasional pain due to lack of foreplay or because they were tired and lazy about having sexual intercourse. Two other women admitted that they did not feel pain during intercourse but were afraid because they had scars from previous Sectio

Caesaria (SC) operations, but sometimes they had pain in the stomach. These women cannot enjoy sexual relations. Even though sexual problems are reported to be the second main cause of divorce among Muslim couples (Ng et al., 2023). The NSSS (The New Sexual Satisfaction Scale) questionnaire is a type of questionnaire that can be used to measure sexual satisfaction in both clinical and non-clinical samples. The conceptual framework of this questionnaire comes from sexuality counseling literature and focuses on several aspects of sexual satisfaction, namely Sexual Sensation, Sexual Presence / Awareness, Sexual Exchange, Emotional Closeness and Sexual activity (Brouillard et al., 2020).The aim of the research is to determine the effect of counseling on the sexual satisfaction of postpartum women in Puskesmas Kamonji working area.

METHODS

This research is a pre-experimental quantitative research with a one group pretest-posttest design. Data collection was carried out at the Community Health Center and several posyandu as well as Independent Midwife Practices (PMB) in the work area of Puskesmas Kamonji, Palu City during July – August 2023. The population in this study was primiparous women who had babies aged 2 – 6 months with a sample size of 49 respondents. The sample was determined using a non-probability sampling technique, namely consecutive sampling based on the inclusion criteria: a) Married; b) Living with a husband who has been able to have sexual relations for at least one month; c) There are no complications during delivery; d) There is no previous history of sexual dysfunction; e) Willing to be a respondent. Meanwhile, the exclusion criteria in this study were: a) Currently being treated for a medical illness; b) Currently using hormonal contraception.

The research began by selecting respondents who met the inclusion criteria. Respondents were then asked to fill out the NSSS (The New Sexual Satisfaction Scale) pretest questionnaire. Furthermore, respondents are given appropriate counseling about sexual sensations, sexual awareness, mutual give and take in sexual relations, emotional closeness and sexual activity. Counseling is carried out for a maximum of 30 minutes accompanied by questions and answers. Counseling is repeated every week until the fourth week. In the fourth week, respondents filled out a posttest questionnaire.

Sexual satisfaction measured here is the feeling of pleasure or satisfaction felt by respondents, especially those related to Sexual Sensation, Sexual Presence / Awareness, Sexual Exchange, Emotional Closeness and Sexual activity. The Measurement uses a standard questionnaire with the NSSS scale (The New Sexual Satisfaction Scale)(Brouillard et al., 2020) a total of 20 statement items. The assessment was carried out using a Likert scale, with 5 levels ranging from not at all satisfied (0) to very, very satisfied (5). The data presented in this research is in the form of tables and narrated. This research has gone through ethical clearance at the Palu Ministry of Health Health Polytechnic Health Research Ethics Commission and has received ethical approval no. 0083/KEPK-KPK/V/2023.

RESULTS

Table 1. Frequency Distribution of Respondents Based on Age and Education Level

Characteristics	f	%
Age		
<20 Years	2	4.1
20 – 35 Years	47	95.9
Education		
Elementary school	3	6.2
Junior High School	20	40.8
Senior High School	18	36.7
Bachelor	8	16.3
Total	49	100

Table 1 shows that almost all respondents were aged 20 – 35 years (95.9%), and almost half of the respondents had junior high school education, 20 respondents (40.8%).

Table 2. Frequency Distribution according to the answers to the questionnaire statement before and after being given counseling

No	Statement	Pre-test		Post test	
		f	%	f	%
1	Sexual Sensation	260	53.06	275	56.12
2	Sexual Presence / Awareness	653	53.31	652	53.22
3	Sexual Exchange	896	52.24	913	53.24
4	Emotional Closeness	408	55.51	427	58.10
5	sexual activity	379	51.56	379	51.56

Table 2 above shows the changes in scores between before and after being given counseling about sexual satisfaction. There was a higher increase in statements regarding sexual sensation and Emotional Closeness. Meanwhile, in general, the results of counseling can be seen as in the picture below.

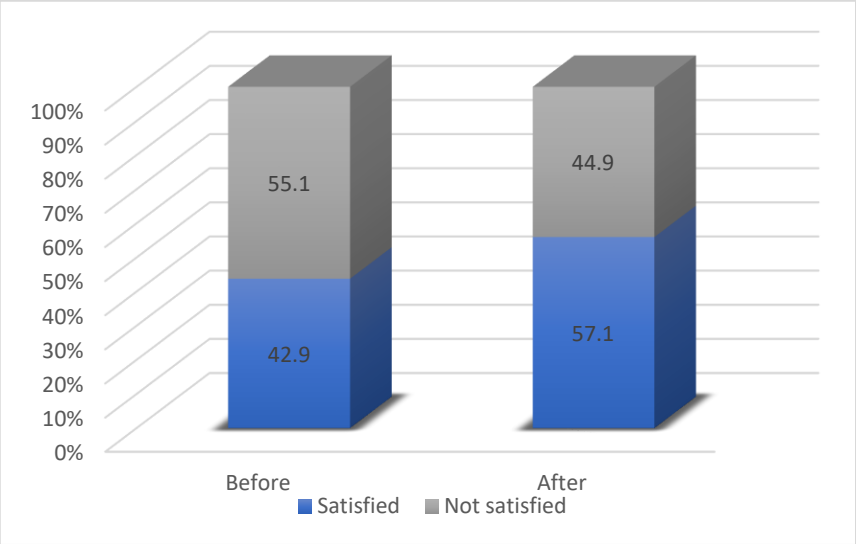

Figure 3. Frequency Distribution of Respondents According to Sexual Satisfaction before and after being given Counseling

Figure 3 shows the frequency distribution of respondents' sexual satisfaction, where before being given counseling, almost half of the respondents were sexually satisfied, namely 42.9%, but after being given counseling about sexual satisfaction, an increase was seen where the majority of respondents felt sexually satisfied to 57.3 %.

Table 3. The Effect of Counseling on Sexual Satisfaction in Puskesmas Kamonji working area, Palu City

Variable	n	Median	Average±sb	p-value
Before being given counseling	49	53 (47 – 57)	53.0 ± 2,602	< 0.001
After being given counseling	49	54 (49 – 58)	54.0 ± 2,525	

Bivariate data analysis was carried out using the Wilcoxon test because the data distribution was not normal, rather than using the paired T-test. Seen onTable 3 shows a significance value < 0.001 (p < 0.05). Thus, it can be concluded that there is a significant difference in sexual satisfaction before and after providing counseling regarding sexual satisfaction to respondents in Puskesmas Kamonji working area, Palu City.

DISCUSSION

The results of this study show a significant difference in sexual satisfaction between before and after being given counseling about sexual satisfaction. The researcher assumes that this is because talking about things related to sexual practices and sexual satisfaction is an issue that is not appropriate to discuss with other people. Women also tend to maintain their image, not wanting to be seen as a woman who is hungry for sex, even though in fact it is a basic human need. During counseling activities and filling out questionnaires, many respondents felt embarrassed to talk about or reveal things related to their sexual life. There were respondents who said they were embarrassed, this was something taboo, uncomfortable to talk about with other people, there were even potential respondents who refused to be respondents when told about the aims and objectives of the research.

In terms of health and culture, women are prohibited from having sexual relations up to 40 days after the postpartum period (Gutzeit et al., 2020). But even though the 40 days have passed, there are still many women who have not been able to enjoy sexual relations. Guidelines published by WHO to address the problem emphasize the importance of counseling regarding the resumption of sexual relations (Radziah et al., 2013).

Recent research shows that women receive very limited counseling from professional staff regarding sexual relations, especially from pregnancy to postpartum (Janssen et al., 2023). Counseling carried out in health facilities mostly only focuses on danger signs for both mother and baby (Chayachinda et al., 2015). Even if there is a discussion about postpartum women's health, it is mostly about the use of postpartum contraception to provide space between births. There is very little counseling regarding efforts to reduce sexual dysfunction or increase sexual satisfaction during the postpartum period (Chayachinda et al., 2015; Ng et al., 2023). This could be due to a lack of provider knowledge or clinical guidelines (Janssen et al., 2023). Identifying and overcoming these sexual problems has a big impact not only on women's health but also on the survival and development of their children so that they

are raised by mothers who are physically, mentally, socially, and emotionally healthy (Hababa & Assarag, 2023).

The results of the study showed differences in sexual satisfaction between before and after providing counseling about sexual satisfaction to respondents. Research conducted by Erfanifar et al., (2022), where the research involved a case group that was given counseling and control to primiparous respondents. The research shows that counseling can reduce anxiety and fear about postpartum sexual relations, improve mental and psychological health, increase sexual self-efficacy, and increase marital happiness. Likewise, research conducted by Ghafoori et al., (2022) where there was a statistically significant increase in sexual satisfaction in the group given counseling compared to the control group. Counseling provided to the case group can help solve the patient's sexual problems and concerns. Providing counseling is also recommended for women suffering from dyspareunia because they are at risk of experiencing sexual health problems that persist for up to a year postpartum (Ghafoori et al., 2022; Gommesen et al., 2022). Increasing sexual satisfaction, creating positive psychological effects, and reducing stress and anxiety are also the results obtained from providing counseling to postpartum women (Nejad et al., 2023).

The counseling provided should be comprehensive to married couples regarding sexuality before, during, and after pregnancy (Erfanifar et al., 2022). Other researchers also argue that postpartum women need professional counseling about their body image and sexual life after giving birth (Gommesen et al., 2022; Ng et al., 2023).

CONCLUSIONS AND RECOMMENDATIONS

It can be concluded that counseling can influence the sexual satisfaction of primiparous women. It is recommended that starting from first-level health facilities provide counseling, especially regarding meeting sexual needs periodically since pregnancy as preparation for facing sexual relations in the postpartum period. The involvement of the husband's role is highly recommended to become a support system, especially understanding the wife's condition, helping with household activities, and caring for children so that it can help with physical and good mood in dealing with sexual problems during this period.

ACKNOWLEDGEMENTS

We appreciate to Direktorat Jenderal Tenaga Kesehatan Kesehatan for research funding, the participants' and their families' enthusiastic participation in the study, the clinical staff at participating, the study research team, and the operational support staff for their contributions to the trial.

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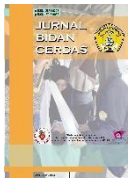
Jurnal Bidan Cerdas
e-ISSN: 2654-9352 dan p-ISSN: 2715-9965
Volume 5 Nomor 4, 2023, Halaman 199 – 207
DOI: 10.33860/jbc.v5i4.3014
Website:https://jurnal.poltekkespalu.ac.id/index.php/JBC
Penerbit: Poltekkes Kemenkes Palu



Quick Evaluation on Preterm Baby Developmental Care Model Focusing on the Suitable Component and Intervention in Indonesia

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ARTICLE INFO

Article History:

Received: 2023-09-09
Accepted: 2023-12-28
Published: 2023-12-31

Keywords:

quick evaluation; developmental care model; premature babies.

ABSTRACT

Introduction: The neonatal stage is important because of its high mortality risk. Neonatal Intensive Care Unit (NICU) is both an important and dangerous place for preterm babies since it can increase the developmental disorders in the baby. Various programs containing several early interventions for preterm babies are implemented and combined into a developmental care model. **Objective**: This study identified the components, contents, and interventions in the developmental care model for preterm babies that is suitable for Indonesia. **Method:** This qualitative research was done through Rapid Assessment Procedures (RAP) to produce information quickly to help decision-making, continued by content analysis using Microsoft Excel through several stages, namely case classification, condensing, streamlining meaning, and compiling, hence producing subcontent. **Results**: The DSC developmental care model looks more detailed, while NIDCM has core components of teamwork and collaboration that are not found in the DSC, thus complementing each other. **Conclusion**: The NIDCM developmental care model is more applicable than DSC since it can be done in the NICU with limited human resources or staff that are not yet fully trained. Both interventions need to be made shorter, and terms can be created as a combination of both so that they become alternative developmental care.

INTRODUCTION

World Health Organization reported that 15 million preterm birth occurred annually in the world, and Indonesia ranks the fifth highest preterm birth with 675,700 cases. *Net Death Rate* (NDR) of neonatal preterm case in NICU occurred due to unprepared service from the resources that have not met the Man, Money, Material, method, Machine, Market, Technology, Time, Information (6M 2T 1I) factors. Preterm baby contribute to 60% to 80% of neonatal mortality and has mortality risk rate of 20 times higher than baby born with normal weight (Syamsu, 2021)

Various programs consisting of early intervention for preterm baby have been done and combined with certain developmental care model. However, the implementation of this developmental care in various hospital in Indonesia has not been optimal due to many obstacles encountered, particularly by Regional General

Hospital of Undata (RSUD Undata) and Regional General Hospital of Anutapura (RSUD Anutapura) Palu. The health workers in charge of neonatal ward in RSUD Undata Anutapura Palu ideally must have a certificate of developmental care competences. Globally, the certification is obtained through *The Wee Care Neuroprotective NICU Program.* However, such program and the similar ones are not provided in Indonesia yet, hence becoming the primary trigger of the suboptimal implementation of developmental care in neonatal ward.

Developmental care includes the adjustment of baby care and ability that involves the family. There are currently 5 preterm developmental care model, including *Developmental Supportive Care* (DSC), *Newborn Individualized Developmental Care and Assessment* Program (NIDCAP), *Infant Behavioral Assessment and Intervention Program* (IBAIP), *Model Universal Developmental Care* (UDC), and *Neonatal Integrated Developmental Care Model* (NIDCM).

In addition to the implementation of the preterm baby developmental care model, Indonesia also does not have *the Wee Care Neuroprotective NICU Program* or other program, hence it becomes the main trigger of the suboptimal developmental care implementation in neonatal ward. Previous research found that the human resources competence in several NICU room of hospital, particularly some of the pediatrician do not have *Newborn Life Support* certificate yet and the nurses do not have NICU certificate yet. In this case, the strategic issue for the medical staff who do not have the competence needed are participating in a training (Syamsu, 2021).

Globally, this certification is obtained from *the Wee Care Neuroprotective NICU Program 10*. *Wee Care Neuroprotective* training program in NICU room is effective in improving seven main nerve protection measures for the development focusing on preterm neonatal families. This program improves neonatal care and practice as a whole and shall be widely implemented in NICU, particularly for the preterm babies. Research concerning the most preterm baby developmental care model needed in Indonesia, in addition to its effectiveness, has not been done. Furthermore, no research has been done on the efforts to improve the quality of the developmental care model implementation by human resources in NICU through training, so that it is assumed as a novelty aspect of this research, that is by looking at the implementation of integrated and applicative preterm baby developmental care. Therefore, this research aims identify the component content and intervention in preterm baby developmental care in Indonesia.

METHOD

This qualitative research was carried out through *Rapid Assessment Procedures* (RAP) aiming to produce quick information that can assist the decision making. RAP has been used in organization evaluation studies and healthcare service administration (Vindrola-Padros & Vindrola-Padros, 2018). Furthermore, it also provides information about cultural values, beliefs, and perspectives needed to effective design health education program or curriculum (Amadio, 2013; Palinkas & Zatzick, 2019). This research involved six experts, including the practitioners and academics specialized in pediatric care throughout Indonesia. In this case, the data collection method applied in RAP is structured interview to identify the component and its contents in the developmental care model as well as formative evaluation to obtain agreement concerning the suitable intervention to be used in Indonesia. Expert was first invited through invitation letter to participate in this research, containing the objective and brief explanation of the research. After the experts agreed to participate, time contract for the interview was distributed, and they filled the instrument in the forms of checklist of

the components, component contents, and intervention in the preterm baby developmental care model containing DSC (Coughlin, Gibbins, & Hoath, 2009; Jannes et al., 2020; Klug et al., 2020; Liaw, Yang, Chang, Chou, & Chao, 2009; Mohammed, Khamis, & Sabry, 2018; Mohammed, Bayoumi, & Mahmoud, 2014; Sathish et al., 2019) and NIDCM (Altimier & Phillips, 2016, 2013; Kim & Shin, 2014; Syamsu, 2021) as the references. The data collected were then processed through content analysis using Microsoft excel in several stages, including case classification, condensation of meaning downsizing, and compilation so that content and sub-content are obtained. This research has received ethical approval with number 0030/KEPK-KPK/II/2023 in Poltekkes Kemenkes Palu.

RESULTS

In this research, six experts participated with education level of graduate program and specialized in pediatric care. Among them, 4 experts are academics (66.7%), while the other two are practitioners in NICU room (33.3%). We juxtapose the main developmental care component in DSC and NIDCM models, then asked the experts to choose or provide the most suitable term as preterm baby developmental care. The results are provided in the following table:

Table 1. Experts' agreement concerning the components and their content in developmental care suitable in Indonesia

Content		Sub-content
Eight main components of preterm baby developmental care	1	Sleeping period surveillance
	2	Minimizing stress and pain
	3	Cooperating with the family
	4	Recovery environment
	5	Position setting and treatment
	6	Nutrition optimization
	7	Protecting skin
	8	Team-cooperation and collaboration
Varied component content	1	Modification of component content: assessing the status of baby sleeping-caking up; baby pain; family interaction; interdisciplinary care – optimal baby positioning
	2	Combination of DSC & NIDCM component contents

Table 1 above shows that NIDCM Model term is more dominant based on the condition of Indonesia because 7 of 8 terms were chosen by the experts. Meanwhile, in DSC term, there is only 1 term used, that is "nutrition optimizing". Related to the component content, several experts suggested modification for the conformity and combination of the component content of DSC and NIDCM. However, NIDCM model is more dominant and all of its components can be adopted. This matter is strengthen by the statement from the expert as follow:

> *"It shall be adopted and modified so that it can complete each other. It is difficult to involve the parents in the baby care in NICU. It is also difficult to assess the status of baby sleeping-waking up. It is difficult to assess the baby pain in each procedure or treatment. It is difficult to involve the family to interact with the baby, to evaluate the competence of the parents. In addition it is difficult to be adopted for the interdisciplinary care each week. The limitation of NICU human resources is the reason why optimal baby positioning cannot be carried out"* (E4, E5, E6)

"*Description of both is similar. DSC seems more detailed, while NIDCM has main components of team cooperation and collaboration that are not met in DSC, hence they can complete each other. Another term can be made as the combination or the best version of the existing term so that it can be the developmental care alternative, thus both model can be combined."* (E1, E2, E4, E5)

"NIDCM is more applicative and can be carried out at NICU condition with limited human resources or NICU whose staffs have not been completely trained. NIDCM is more flexible and gives more spaces for the family. Therefore, NIDCM is more suitable to be applied holistically" (E4, E5, E6)

Furthermore, experts were required to evaluate the conformity of the intervention with the competences that must be owned by NICU staff in providing preterm baby developmental care. The conformity refers to whether the intervention provided is suitable to be applied by the healthcare staff in the NICU room based on the facilities, condition, and situation of Indonesia. There were 149 intervention in the developmental care, consisting of 18 interventions for the sleeping period surveillance, 11 interventions for minimizing stress and pain component, 23 interventions for family cooperation, 30 interventions for recovery environment component, 20 intervention for positioning setting and treatment component, 17 interventions for nutrition optimizing component, 15 interventions for skin protection, and 15 interventions for team cooperation and collaboration. The intervention agreed by the experts are provided below:

Table 2. Experts' agreement related to the intervention in developmental care model suitable for Indonesia

Content		Sub-content
Intervention for sleeping period surveillance	1	Measurement of sleeping-waking up condition
	2	Protecting the sleeping cycle
	3	Maintaining the room calm
	4	Avoiding sleep interruption
	5	Flexible care schedule
	6	Method to waking the baby up
	7	Assisting the baby to sleep
	8	Closing the incubator
	9	Avoiding the use of sedative
	10	Position that support sound sleep
	11	Making sure that the sleep pattern is normal
	12	Guiding the parents in baby sleeping transition
Intervention to minimizing stress and pain	1	Training the parents to know the symptoms of stress and how to overcome it
	2	Using the pain measurement tools
	3	Evaluation of intervention causing stress and pain
	4	Non-pharmacological support
	5	Aids for positioning setting
	6	Directing the parents to minimizing stress and pain
	7	Inviting the parents to be involved in the procedure that may cause pain
	8	Training the parents to reduce stress and pain

Content		Sub-content
Intervention to cooperate with the family	1	Training the family to participate actively in baby care
	2	Family support
	3	Adhering to HIPPA and security in NICU
	4	Administering the needs for baby care
	5	Supporting the breastmilk release and breastfeeding
	6	Improving the parents' confidence in taking care for the baby
	7	Sharing information with NICU staff concerning the principles and method of family-based care
Intervention for recovery environment	1	Training the parents to realize recovery environment
	2	Providing neat and clean room
	3	Planning single family room
	4	Tactile - facilitating skin contact
	5	Setting the room humidity – if there is any ELBW case
	6	Change the baby position carefully
	7	Smelling – maintaining the room free from odour
	8	Feeding colostrum/ breastmilk
	9	Realizing positive breastfeeding experiences
	10	Hearing – maintaining the room to make it calm and quiet
	11	Being careful in making noise
	12	Setting the noise level at about 45 dB
	13	Avoiding alarm sound
	14	Visual – provides lighting at maximum of 60 fv
	15	Close the baby eye when expose to light
	16	Setting the baby view area
	17	Avoid visual stimulus
	18	Recovery environment – pay attention to all light, sound, movement, and aroma sources. Remove unnecessary stimulation sources.
	19	Provide guidance for parent about how to realize and maintain the recovery environment
	20	Suggesting environment renovation that provides facilities and infrastructures that support the family support
Intervention for positioning setting and treatment	1	Facilitating skin contact
	2	Guiding the parent of how to set the position and hold the baby
	3	Assisting the optimal baby positioning
	4	Making sure that the baby position is correct
	5	Providing stomach pad
	6	Using a mat while bathing/weighing
	7	Avoid prone position
	8	Providing individual needs
	9	Sensitive to baby behaviour
	10	Carrying out care with the baby
	11	Changing the position of the baby in every four hours
	12	Bring the hand closer to the mouth of the baby
	13	When giving intervention, bring all tools closer
	14	Involving the parents during intervention
	15	Position self as the baby partner
Intervention for nutrition optimizing	1	Guiding the parents when giving oral stimulation
	2	Encouraging oral stimulation/ positive smelling
	3	Reducing negative perioral stimulation
	4	Considering the use of catheter
	5	Providing positive eating experience

Content		Sub-content
	6	Teaching the parents of the importance of breastfeeding
	7	Supporting the breastmilk release and breastfeeding
	8	Giving direct oral breastfeeding to mothers' breast
	9	Supporting the breastfeeding abilities before the baby go home
	10	Guiding the parents to give positive breastfeeding experience
Intervention for skin protection	1	Checking the position of nasal prong-if there is any
	2	Reduce the adhesive sticking the baby skin and being careful when removing it
	3	Avoid the use of soap and emollient
	4	Bathing the baby on bed or bathtub using warm water
	5	Bathing the baby once in every 72 – 96 hours
	6	Guiding the patents of how to protect the baby skin
Intervention for team cooperation and collaboration	1	Discussing the intervention period with the team
	2	Respect and support each other's role
	3	Making sure that all baby and families are treated well
	4	Teaching the staff to improve the developmental care
	5	Teaching the staff about the listening and communication abilities

Table 2 above shows that among 149 intervention in the developmental care, there are only 83 interventions most suitable for NICU room condition in Indonesia. It consists of 12 interventions for the sleeping period surveillance, 8 intervention for minimizing stress and pain component, 7 interventions for family cooperation component, 20 for recovery environment component, 15 interventions for positioning setting and treatment component, 15 interventions for nutrition optimizing component, 6 intervention for skin protection, and 5 interventions for team cooperation and collaboration.

There are 66 interventions that are not suitable with the details of the seven similar interventions yet there are in different components. In addition, 59 interventions need to be reviewed because they are not supported by the facilities as well as NICU human resources and situation. This is supported by the statement from the experts as follow:

> *"The existing intervention are very complete but not all can be adopted and applied more due to the current NICU condition that has not met the standard and number of human resources, human resources' abilities, or facilities to support the care. I am disagree if the parents are involved as full participant in NICU because seeing the current NICU condition, it is impossible. Parents should not be given full access to medical record because the document is confidential."* (E4, E5, E6)

> "*The content of the components and the intervention must be made more briefly. Several interventions need to be reviewed and place in accordance with the components"* (E2, E6)

DISCUSSION

Components and its contents in preterm baby developmental care suitable for condition in Indonesia.

Developmental care is a method that aims to adjust the NICU room environment so that it can reduce the preterm babies' stress, improve their physiological stabilities, maintain their sleeping rhythm, and improve the baby's nerve growth and maturity (Altimier & Phillips, 2016; Sizun & Westrup, 2004). The developmental care methods

applied in this research are DSC and NIDCM in order to reach approval related to component and its contents in accordance with the care need in Indonesia.

This research found 8 components in accordance with Indonesia condition, and most of them are from NIDCM method. Conceptually, NIDCM has seven main neuroprotective treatments and illustrated as overlapping lotus petals consisting of 1) recovery environment, 2) family cooperation, 3) position & treatment, 4) maintaining sleep, 5) minimizing stress and pain, 6) skin protection, 7) optimizing the nutrition and one additional component, that is team cooperation and collaboration (Altimier, 2011; Altimier, 2015; Altimier & Phillips, 2016, 2013). This result is related to the results of the research carried out by Efendi & Rustina (2013) that *Basic Developmental Care* and *Complete Developmental Care* can be applied in NICU but does not affect the results of preterm baby development in long term.

The content of the component in developmental care is suggested to be modified aby combined between DSC and NIDCM because they complete each other. The main component of DSC model contains attribute and criteria, while the main component of NIDCM model contains standard, characteristics, and objectives. In addition, it was also found that the demand of involving the parents in baby care is difficult to reach, while the concept of developmental care emphasizes the training and participation of parents or family to support the social, emotional, and physical health of the baby, and are significant factor in the process of developmental care focusing on family (Rafiey, Soleimani, Torkzahrani, Salavati, & Nasiri, 2016; Symington & Pinelli, 2006).

Intervention in preterm baby developmental conditions suitable for the condition in Indonesia.

Optimal preterm baby growth and development in developmental care includes intervention that manage the NICU environment so that it can resemble the intrauterine environment and give integrated individual intervention with the healthcare staff and preterm baby family (Kim & Shin, 2014). Intervention of development care is proven effective to remove stress as well as to improve the sleep quality and nerve developmental results (Lavallée et al., 2019).

This research result shows that most of the intervention in NIDCM model can be adopted in Indonesia. However, 44% of the developmental care intervention assessed are not suitable yet due to facilities, infrastructures, and human resources. In order to give qualified developmental care for preterm baby, NICU system and personal characteristics of the service provider must be considered well. This is in line with the result of other research projects that work condition, financial support, manpower support, staff changing, and patient case burden in NICU are different, depending on the healthcare service system and the socio-cultural aspect of each country, and these matters become the obstacles of developmental care (Graven & Browne, 2008; Lavallée et al., 2019).

Developmental care that is not supported by the institution administration can increase the working intensity of the NICU medical staff, hence negatively affects the work environment (Altimier, 2015). Therefore, the most appropriate and suitable developmental care is needed in accordance with each healthcare services. When an intervention is carried out on baby who has risk of developmental disruption, then the intervention should have preventive focus and strategy to minimize the developmental complication. Various proofs have been found and show that developmental care intervention has appropriate effect on the developmental results, both in short and long-term (Syamsu, 2021; Syamsu, Febriani, Alasiry, Erika, & Rustina, 2020; Vanderveen, Bassler, Robertson, & Kirpalani, 2009).

CONCLUSION AND RECOMMENDATIONS

Developmental care model of NIDCM is more application and can be carried out in NICU condition with limited human resources or NICU with staff who have not been completely trained compared to DSC. These two interventions complete each other so that it needs to be made more briefly. In addition, another term is needed as the combination of both so that it can be developmental care alternative.

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Jurnal Bidan Cerdas
e-ISSN: 2654-9352 dan p-ISSN: 2715-9965
Volume 5 Nomor 4, 2023, Halaman 208 – 219
DOI: 10.33860/jbc.v5i4.3206
Website:https://jurnal.poltekkespalu.ac.id/index.php/JBC
Penerbit: Poltekkes Kemenkes Palu

Dietary Intake and Emotional Eating Status in Relation to Gestational Weight Gain among Indonesian Pregnant Women in Bantul

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ARTICLE INFO

Article History:

Received: 2023-10-12
Accepted: 2023-12-29
Published: 2023-12-31

Keywords:

dietary intake;
emotional eating;
diversity intake;
gestational weight gain;

ABSTRACT

Introduction: Covid-19 pandemic impact the ability to reach nutritious food due to social restrictions and economic difficulties situation. **Objective:** This study determined the relationship between dietary diversity status (DDS) and emotional eating and its association with dietary intake and gestational weight gain (GWG) in Bantul, Indonesia. **Methods:** The cross-sectional study design conducted from December 2021 to February 2022 in three public health centers. Of 105 third trimester pregnant women were obtained and interviewed for DDS, semi quantitative food frequency questionnaire (SQ-FFQ), and emotional eating questionnaires. Bivariate analysis was used to measure association between variables with SPSS 25.0 version. **Results:** The majority of pregnant women had an adequate varied diet and an emotional eating with food (59.0% and 56.2%, respectively). The GWG status was mostly (61%) had normal GWG. There was no association of DDS with GWG ($p = 0.131$). However, there was a significant association between emotional eating and dietary intake status on GWG status ($p<0.001$ for all comparisons). **Conclusion:** Dietary intake and emotional eating during pregnancy were linked to GWG status. Pregnant women need to maintain their psychological well-being and dietary intake in order to maintain a normal GWG and prevent adverse pregnancy outcomes.

INTRODUCTION

Coronavirus Disease 2019 (COVID-19) is a new type of disease that can be transmitted from human to human and has spread widely in the world and has become a global pandemic (PPSDM;, 2020; Rachmah et al., 2021). A pandemic causes a condition of fear and stress that can increase many risk factors that affect our health status. Individuals who experience stress can cause various kinds of problems including the economy, family, work (Devid Saputra, 2020). Stress will also affect emotional eating, which makes people eat more because it doesn't fulfill their appetite in order to improve emotional conditions or as a reward (Trimawati & Wakhid, 2018). Pregnant women are a vulnerable group and easily get stressed due to the pandemic and worries about their pregnancy and childbirth. Pandemic has made people spend more time at home and there may be an opportunity to change eating patterns to

become less diverse, increased consumption of processed foods, and lack of consumption of nutritious food (*FAO, IFAD, UNFPA, WFP, WHO, dan UNICEF tentang Ketahanan Pangan dan Gizi | UNICEF Indonesia*, 2020).

The pregnancy is a very important period for maintaining body weight because it determines the generation's health status that will be born (Robertson et al., 2019). Adequate weight gain is necessary to support the growth of the fetal so that it can be born normally and healthy (Zhang et al., 2020). Gestational weight gain (GWG) is influenced by many factors, including nutritional status, maternal age during pregnancy, diet during pregnancy, knowledge, social factors, and poverty (Aji et al., 2022; Mooduto et al., 2023). Adequate weight gain during pregnancy can reduce the risk of complications and inadequate weight gain during pregnancy will have negative consequences for both of them (Nurhayati, 2016). Therefore, it is necessary for pregnant women to maintain their adequate nutritional intake and weight gain in order to prevent risks such as low birth weight, risk of labor bleeding, gestational diabetes mellitus, and premature birth (Aji et al., 2022; Susanto et al., 2021).

One of the nutritional problems experienced during pregnancy is KEK (Chronic Energy Deficiency) (Istiany, 2013). The prevalence of KEK in Indonesia in 2018 is 17.3% (Kemenkes RI, 2018). Based on data from the Special Region of Yogyakarta (DIY) Health Service Department, the prevalence of pregnant women suffering from CED in 2019 was 12.68%. The prevalence of CED in pregnant women in Bantul Regency in 2016 was 9.92%, increased in 2018 to 9.96% and continued to increase in 2019 to 10.66% with the highest cases being in Banguntapan District, namely 197 cases.

There is a significant relationship between nutritional status and diet (a diet of staple foods and animal side dishes) on the weight gain of pregnant women (Harti et al., 2016). Consuming of balanced nutrition of carbohydrates, fats and proteins can help increase pregnant women's weight gain optimally (Lai et al., 2019). Apart from dietary patterns, diversity in food consumption also influences weight gain. The Dietary Diversity Score (DDS) is a simple method for measuring the diversity of food consumption at the household and individual level. Food consumption diversity refers to increasing consumption of various types of food that can meet nutritional needs optimally, because no one food contains all the nutrients needed by the body (Nurhayati et al., 2020). Pregnant women who consume a variety of foods with the lowest scores tend to had no adequate of weight gain and failed to meet the standards (Tebbani et al., 2021). Dietary diversity has a positive relationship with weight gain in pregnant women (Perkins et al., 2018). Hence, this study determined whether the dietary diversity status (DDS) and emotional eating and its association with dietary intake and GWG in Bantul, Indonesia.

METHODS

This was cross-sectional study design as known as Bantul's Maternal Weight Gain (BMW) Study. This study conducted between December 2021-February 2022 at three public health centers (Banguntapan 1, Banguntapan 2, and Banguntapan 3) in Bantul District, Special Region of Yogyakarta Province, Indonesia. The study variables were socio-demography, dietary diversity score (DDS), dietary intake, emotional eating, and other factors associated with gestational weight gain (GWG). The aimed of this study was to determine whether DDS, dietary intake, and emotional eating status have associated with GWG during pregnancy during pandemic Covid-19.

The sample collection in this research was used the Purposive Sampling technique. The results of calculations using the Slovin formula obtained a sample of

95 subjects with 90% of power calculation. To anticipate if there is incomplete or unwilling data, the sample will be increased by 10%. So the total sample was 105 people. The sample in this study was pregnant women who met the criteria. The study participants were women with third trimester of pregnancy. The inclusion criteria of study participants were women who have maternal and child book (KIA), have pre-pregnancy body weight data, clearly to be able to communicate, healthy, and willing to be study participant. While, women who have given birth and chronic diseases were excluded. These data were acquired directly from the participants through questionnaires and included information from the women's medical histories as provided by certified nutritionists and midwives. Total of study participants was 105 third trimester pregnant women from three different public health centers. All participants were signing the informed consent form and following the study protocol. All individual information gathered before the data collection and recruitment in this study has remained confidential. This study was approved by Universitas Alma Ata's Ethic Committee review board (No: KE/AA/XI/10637/EC/2021).

Data characteristics were collected from the socio-demographic questionnaire such as age, education level, and parity status. The pregnancy history data was collected from maternal and child book (KIA). This book was used to monitor pregnancy health recorded during pregnancy until the newborn aged five years old, promoting maternal and neonatal health education (Osaki et al., 2018). Secondary data in this study is data from a cohort of pregnant women which was obtained from the records of midwives at Banguntapan Community Health Center 1, Banguntapan Community Health Center 2, and Banguntapan Community Health Center 3.

Emotional eating was the purpose of eating to not satiate the hunger, but to relieve stress and to enhance one's emotional state (Trimawati & Wakhid, 2018). Emotional eating status was to determine whether women during pregnancy have changing consumption behavior during pandemic covid-19. The Dutch Eating Behavior Questionnaire (DEBQ-C) in Bahasa Indonesia version was used to assess emotional eating status (Blau et al., 2018). Three domains are covered by the DEBQ-C: controlled eating, external eating, and emotional eating. Regarding the feelings of anxiety, aggravation, boredom, despair, loneliness, disappointment, rage, fear, etc., only the emotional eating domain, which consists of 13 items, was employed in the current survey. The frequency of occurrence of the aforementioned emotional eating during the COVID-19 pandemic was examined using a Likert scale. The frequency was categorized as "never", "rarely", "sometimes", "often", or "always" and was given a score between 1 and 5. Assessment of each aspect of eating behavior is carried out by obtaining an average score with dividing the total score from the aspect of eating behavior by the number of questions on each aspect. If the average score is <2.35, then the emotional eating score is said to be low and vice versa if the average score is ≥ 2.35 then it is said to be high (Cebolla et al., 2014).

Anthropometric measurements were performed by a trained measurer in a private room with the help of a midwife. A portable adult beam scale with 150 kg capacity (Gmbh & co.kg, Germany) was calibrated every morning and used to measure weight of participants. Height measurements were performed twice on every participant and the mean of the readings was considered as the height using stadiometer (OneMed Medicom stature meter, YF.05.05.V.A.1022, Indonesia). The PPBMI was created as the standard formula weight in kg divided by the square of body height in meter (Pan & Yeh, 2008). Four categories classification from the Asian-Pacific population cut-off point were determined as the World Health Organization (WHO) recommendation (underweight, < 18.5 kg/m2; normal, 18.5–22.99 kg/m2; overweight, 23.00–24.99

kg/m2; and obese ≥ 25 kg/m2) (WHO, 2004).

GWG status determined when the women divided into two group categories who gain adequate and inadequate based on pre-pregnancy BMI (PPBMI)(Kominiarek & Peaceman, 2017). The Institute of Medicine (IOM) weight gain recommendation was used as the GWG status indicator (Institute of Medicine, 2009). The IOM guidelines state the following categories for recommended GWG: 12.5–18 kg for underweight, 11.5–16 kg for normal weight, 7–11.5 kg for overweight, and 5–9 kg for obese (Table 1).

Table 1. Pre-pregnancy body mass index (PPBMI) and gestational weight gain (GWG) categories

PPBMI status	Asian-pacific BMI status	IOM-recommended GWG
Underweight	<18.50	12.50-18.00
Normal	18.50-22.99	11.50-16.00
Overweight	23.00-27.49	7.00-11.50
Obese	≥27.50	5.00-9.00

IOM: International of Medicine; GWG: Gestational weight gain; BMI: Body mass index; PPBMI: Pre-pregnancy body mass index.

Dietary intake data were assessed using the semi-quantitative food frequency questionnaire (SQ-FFQ). The details about SQ-FFQ data explanation was available elsewhere (Aji et al., 2019, 2020, 2022; Putri et al., 2019). We calculated energy (kcal), carbohydrate (g), protein (g), and fat (g) to determine dietary intake of pregnant women during their third trimester of pregnancy. Dietary diversity is defined as the consumption of at least four food groups of a total of seven food groups: 1) grains, roots and tubers; 2) legumes and nuts; 3) dairy products; 4) animal protein foods; 5) eggs; 6) vitamin-A rich fruits and vegetables; and 7) other fruits and vegetables (Kant et al., 1995). Dietary diversity score (DDS) was calculated by counting the number of the food groups (group 1-7) which was consumed during last 24-h recall (Rathnayake et al., 2012). Summing up all the scores and dividing them by the number of respondents. Therefore, DDS was not considering a minimum intake for the food group and the participants divided into adequate (if they consumed ≥5 food groups) and inadequate (if they consumed <5 food groups).

Data analysis was performed using SPSS V.23.0. Basic information about the variables was provided by descriptive statistics, which used frequencies, means, and standard deviations (SD) to represent both numerical and categorical data. GWG and the rates of GWG during the third trimester of pregnancy were the outcome variables of interest. The suggestions made by the IOM were compared with these two outcome factors. Chi-square and Mann-Whitney bivariate analyses were used to compare variables. The cut-off for statistical significance was p=0.05.

RESULTS

Table 2 shows that the frequency distribution based on age group shows that the group of pregnant women aged 20-35 years is 88 people (83.8%), the majority of pregnant women who are respondents in this study are aged 20-35 years. In the category of education level, the majority of mothers who were respondents in this study were high school graduates, namely 75 people (71.4%). Based on the level of employment, the majority of pregnant women who were respondents in this study worked as housewives (IRT) of 75 (71.4%). Based on the occupational level of the husband, the most respondents were self-employed/entrepreneur 74 (70.5%). Based on parity, the majority of pregnant women with multigravida parity were 57 (54.3%).

Based on the weight gain of 105 respondents, there were 64 respondents whose weight gain (61%) was in accordance with IOM standards, while 41 (39%) of respondents had weight gain not in accordance with IOM standards. 62 (59%) consumed an adequate varied diet, while 43 respondents (41%) consumed an inadequate varied diet. Then those who experienced emotional eating were as many as 59 (56.2%).

Table 2. Characteristic of Participants

Variables	n	%
Maternal age		
<20	4	3.8
20-35	88	83.8
>35	13	12.4
Mother Educational Level		
Junior high school	24	22.9
Senior high school	75	71.4
Diploma	6	5.7
Mother Occupational Status		
Housewife	75	71.4
Employee	16	15.2
Civil Servant	5	4.8
Entrepreneur	9	8.6
Parity Status		
Primiparous	48	45.7
Multiparous	57	54.3
Dietary Diversity Score (DDS) Status		
Adequate varied diet	62	59.0
Inadequate varied diet	43	41.0
Emotional eating status		
High	59	56.2
Low	46	43.8
Gestational Weight Gain (GWG) Status		
Adequate	64	61.0
Inadequate	41	39.0

Table 3. Dietary Intake Status

Variables	Mean±SD	N	%
Energy, kcal	2146.7±97.7		
Adequacy status of energy intake (n=105)			
Adequate		49	46.7
Inadequate		56	53.3
Protein, g	71.5±8.5		
Adequacy status of protein intake (n=105)			
Adequate		44	41.9
Inadequate		61	58.1
Fat, g	59.3±8.3		
Adequacy status of fat intake (n=105)			
Adequate		57	54.3
Inadequate		48	45.7
Carbohydrate, g	347.5±39.7		
Adequacy status of carbohydrate intake (n=105)			
Adequate		52	49.5
Inadequate		53	50.5

Table 3 shows that the nutrient with the highest percentage is a source of fat (54.3%) while the lowest is a source of protein (41.9%). The average total food intake for pregnant women in Banguntapan District is 2146.7 kcal, 71.9 grams of protein, 59.2 grams of fat and 347.5 grams of carbohydrates. The average consumption is still low when compared to the standard consumption based on the nutritional adequacy rate of third trimester pregnant women who should consume 2550 kcal of energy, 90 grams of protein, 65.3 grams of fat and 400 grams of carbohydrates (Ministry of Health Republic of Indonesia, 2019).

Table 4 shows that the percentage of pregnant women whose adequate gestational weight gain is in the group of mothers who consume <5 types of food groups with a percentage of 48.8% and the least in the group of mothers who consume >5 types of food groups (32.3%). It shows that there is no association between the dietary diversity score (diversity in food consumption) and the gestational weight gain of pregnant women (p> 0.131). It shows that the percentage of pregnant women who have adequate weight gain is higher (58.7%) than women with low emotional eating status, while pregnant women who have inadequate weight gain (76.3%) with emotional eating status. It found that a significant association between emotional eating and gestational weight gain status in pregnant women (p <0.001).

Table 4. Association of DDS and Emotional Eating with GWG Status

	Gestational Weight Gain Status				OR	95%CI	P-Value
	Adequate		Inadequate				
	n	%	n	%			
Dietary Diversity Score							
Inadequate varied diet	21	48.8	22	51.2	2.0	0.9-4.5	0.131
Adequate varied diet	20	32.3	42	67.7			
Emotional eating status							
High	14	23.7	45	76.3	3.3	1.4-7.6	<0.001
Low	27	58.7	19	41.3			

Table 5. shows that the group of women with inadequate weight gain has a median energy intake higher than the group of pregnant women with adequate gestational weight gain. Likewise with protein, fat and carbohydrate intake, the median intake was higher in the group of mothers who had inadequate weight gain compared to those with adequate weight gain. There is a significant median difference between the amount of food consumption (energy, protein, fat, carbohydrates) in the group of mothers with an increase in normal and abnormal weight gain (p <0.001 for all comparison).

Table 5. Association of Dietary Intake with GWG Status

Dietary Intake Status	Gestational Weight Gain Status				P-Value
	Adequate		Inadequate		
	Median	IQR	Median	IQR	
Energy, kcal	1988.5	1945.2 -2031.0	2310.0	2231.0-2366.0	<0.001
Protein, g	66.0	61.1-70.0	76.0	74.8-79.0	<0.001
Fat, g	53.3	50.0-57.8	65.2	60.7-68.5	<0.001
Carbohydrate, g	316.5	305.0-360.0	366.0	350.8-385.7	<0.001

DISCUSSION

DDS Status and Its Association with GWG Status

The diversity of food consumption measured on an individual scale in pregnant women in this study, on average, had a high score of five. However, the score of food diversity in pregnant women was not statistically related to GWG of pregnant women. This could have been due to conducting interviews with women who are consuming quite a variety of types of food so that the data obtained shows a variety of consumption. According to research by Mayimbo S (2020), the DDS cannot describe an individual's eating habits because data collection was carried out using the recall method 24 hours earlier (Mayimbo et al., 2020).

Dietary diversity is influenced by socioeconomic status because the income of a family greatly affects the fulfillment of primary needs, which will have an impact on the nutritional status and health of the family, especially for pregnant women who need a variety of intakes to meet the nutritional needs of the fetus they contain (Dhiu et al., 2022). This study is in line with Ismi Nurwaqiah Ibnu et al., (2020) which states that the food diversity score of pregnant women is not statistically significant for the nutritional status of pregnant women. This could be because it is not known whether the intake consumed is sufficient or not for the calorie needs of pregnant women due to the dietary questionnaire the diversity score only mentions the type of food consumed at least 10 grams with the 24-hour recall method so it cannot describe an individual's eating habits (Ibnu, 2020). However, this study is not in line with the research of Brazier et al (2020) which stated that the dietary diversity score (diversity in food consumption) is positively correlated with weight gain for pregnant women (Brazier et al., 2020). Another study from Tebbani et al., (2021) found that pregnant women with a variety of food consumption with low scores tended to gain weight that did not meet the standard (Tebbani et al., 2021).

Emotional Eating Status and Its Association with GWG Status

Excess GWG based on IOM standards can cause several consequences in pregnancy, such as labor and postpartum. Overweight pregnant women risk lifelong obesity in both mother and child. The desire to consume food and negative influences are often cited as triggers for excessive food consumption in pregnant women (Blau et al., 2018). According to Hadiyuni et al (2021) eating behavior is a condition that describes a person's attitude towards eating manners, eating patterns, eating preferences, and food choices. Unhealthy eating behavior will certainly have a negative impact and it is important for someone to maintain their eating behavior (Hadiyuni et al., 2021). Eating behavior is a risk factor for obesity, one of which is emotional eating. Emotional eating is a tendency to overeat in response to negative emotions that are inadequate and ineffective (Kustantri et al., 2021).

In this study, it is known that the results of the study show that pregnant women who experience emotional eating have adequate GWG with an OR= 3.3, which means that respondents who experience high emotional eating have three times the risk of experiencing weight gain during pregnancy. This happened because during the pandemic, pregnant women experienced increased consumption which caused GWG during pregnancy. This was supported by previous research which stated that people experienced changes in their behavior, such as eating behavior, which was described as emotional eating (Zhang et al., 2020).

Emotional eating that is carried out continuously, can affect improper eating

patterns, weight and health (Sukianto et al., 2020). Wijaksana et al., (2016) explained that, if the amount of energy input and energy expenditure is not balanced, body weight can become heavier than ideal body weight and become obese due to fat accumulation in the body (Wijaksana, 2016).

Dietary Intake Status and Its Association with GWG Status

Pregnant women need far more nutrients than what is needed in a non-pregnant state, nutritional needs increase with increasing gestational age and there is an increase in the basal metabolic rate. contains energy, protein, fat, vitamins and minerals in a balanced portion and according to the recommended requirements (Usrina et al., 2021).

The results of bivariate analysis using the Mann Whitney statistical test showed that pregnant women who consumed higher protein experienced weight gain that was in accordance with IOM recommendations or included in the good category compared to mothers who consumed low protein. The results of this study are in line with Fitri et al., (2018) which stated that pregnant women with low protein intake are 12 times more likely to give birth to LBW babies compared to mothers with good protein intake (Fitri & Wiji, 2018). Haryani et al., (2012) stated that protein intake has a significant relationship with maternal weight gain during pregnancy (Haryani et al., 2012). The results of this study are in line with the theory that increased protein requirements during pregnancy will affect the development and growth of the fetus (Pratiwi & Hamidiyanti, 2020; Siregar et al., 2022). The average protein consumption of pregnant women in Banguntapan District is 71.9 grams of protein.

The results of bivariate analysis using the Mann Whitney statistical test found that pregnant women who consumed higher fat experienced GWG in accordance with IOM recommendations or were included in the adequacy category compared to mothers with low fat consumption. This study is in line with Setyarahma et al, (2016) which states that there is a relationship between the level of adequacy of fat and the GWG of pregnant women (Setyarahma et al., 2016). Fat intake in some pregnant women is low. Fat during pregnancy serves as a source of energy, a source of essential fatty acids, maintains body temperature and protects the placenta and prepares milk production (Ningsih et al., 2021). In this study, the fat intake of pregnant women was 59.2 gr.

The results of bivariate analysis using the Mann Whitney statistical test showed that pregnant women who consumed higher carbohydrates experienced weight gain in accordance with IOM recommendations or were included in the inadequate category compared to mothers who consumed low carbohydrates. This finding is in line with the research by Ningsih Setya N et al (2021) which stated that there is a significant relationship between the amount of carbohydrate consumption and the weight gain of pregnant women (Ningsih et al., 2021). According to research by Syari M et al, (2015) pregnant women who consume less carbohydrates have 12 times the risk of giving birth to LBW newborn (Syari et al., 2015). Carbohydrates are nutrients needed by the body in large quantities to produce energy, carbohydrates can fulfill nearly 60% of the calories needed by pregnant women if the energy needs produced by carbohydrates are sufficient, it will help the formation of the placenta, fetal growth, blood vessels, fat reserves, and changes in metabolism, but conversely if it is not sufficient there will be impaired growth of placental function which will have an impact on the weight and size of the placenta which is more so that it reduces the transfer of nutrients to the fetus (Fitri & Wiji, 2018). In this study, the average carbohydrate intake of pregnant women was 347.5 g of carbohydrates.

Strength and Limitation of The Study

The strength of this research is that data collection is carried out directly so that it can determine the actual health condition of the community, such as eating habits, types of food consumed and foods that are avoided. In addition, this study also has weaknesses, including the age of the respondents who vary so that the standards for nutritional needs that are set also varied.

CONCLUSION AND RECOMMENDATIONS

The diversity intake of pregnant women is not associated with GWG. However, there is an emotional eating effect of pregnant women on dietary intake status and GWG. Pregnant women need to pay attention to the type and amount of food consumed to maintain optimal weight for pregnant women and maintain their psychological well-being and dietary intake in order to maintain a normal GWG and prevent adverse pregnancy outcomes.

ACKNOWLEDGEMENT

Thanks to all participants who participated during the study and all the staff in public health centers of Banguntapan 1, Banguntapan 2, and Banguntapan 3. All the research members and supervisor who helped us a lot in data collection guidance, analysis, and writing the manuscript.

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Jurnal Bidan Cerdas
e-ISSN: 2654-9352 dan p-ISSN: 2715-9965
Volume 5 Nomor 4, 2023, Halaman 220 – 226
DOI: 10.33860/jbc.v5i4.3262
Website:https://jurnal.poltekkespalu.ac.id/index.php/JBC
Penerbit: Poltekkes Kemenkes Palu

Prevalence and Risk Factor of Hepatitis B among Pregnant Women In Prof. Dr. W. Z. Johannes Hospital Kupang, East Nusa Tenggara, Indonesia

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ARTICLE INFO

Article History:

Received: 2023-09-09
Accepted: 2023-12-28
Published: 2023-12-31

Keywords:

pregnant women;
Hepatitis B;
risk factor;
Kupang City;

ABSTRACT

Introduction: Hepatitis B (HB) during pregnancy was a treating condition for both mother and fetus. Prevalence of Hepatitis B in Indonesia was 0,39 and Kupang City was 0,37 based on Riskesdas in 2018. **Purpose**: This study aims to measure the prevalence of hepatitis and its risk factors among pregnant women in Prof. Dr. W. Z. Johannes Hospital Kupang. **Methods**: This study was a descriptive qualitative research using cross sectional design, population was all pregnant women underwent HBsAg Rapid Test excluded HIV co-infection, the sample of this study was 345 pregnant women who visited the hospital during 2021 using constitutive sampling technique, prevalence of hepatitis was calculated and data obtained was analysed using chi-square and fisher exact test for the risk factor. **Results**: Prevalence of Hepatitis B were 19.7% (66 of 345). Risk factor of hepatitis B on this study was >1 sexual partner (p= 0,000, OR= 53,26), while age (p = 0,597), gestational age (p = 0,597), and parity (p = 0,329) were not the risk factors in this study. **Conclusion**: Prevalence of Hepatitis B among pregnant women was high, having >1 sexual partner was risk factor of pregnant women in Prof. Dr. W. Z. Johannes Hospital Kupang. It is recommended to encourage early detection and Hepatitis B vaccine on pregnant women to provide specific protection.

INTRODUCTION

Pregnancy is a term used to describe the development of the fetus in the womb, this development is divided into 3 stages called trimesters consisting of the first, second and third (ACOG committee, 2013; Spong, 2013). There are various worrying conditions in pregnancy, one of which is the threat of disease caused by hepatitis B virus infection which not only endangers pregnant women but also the fetus in her womb. The Indonesian government considers hepatitis B to be a serious problem that requires more attention especially for pregnant women, through the Minister of Health Regulation number 52 of 2017, triple elimination (HIV/AIDS, Syphilis and Hepatitis B) from mother to child is established, one of the programs is to require HBsAg examination during pregnancy with the aim of preventing transmission of hepatitis B from mother to baby (Peraturan Menteri Kesehatan Republik Indonesia Nomor 52 Tahun 2017 Tentang Eliminasi Penularan Human Deficiency Virus, Sifilis Dan Hepatitis B Dari Ibu Ke Anak, 2017).

In 2019 it is estimated that there are 296 million cases of hepatitis B in the world with 1.5 million additional cases each year and the number of deaths from this disease is predicted to be 820,000 deaths. Women who suffer from hepatitis B can transmit the virus to newborns during childbirth (Center for Disease Control and Prevention, 2022; World Health Organization (WHO), 2022). Based on the results of basic health research in 2018, the prevalence of hepatitis B in Indonesia was 0,39, while in the province of NTT was 0,37 and prevalence of Hepatitis B in Kupang City was 0,47 (Kementerian Kesehatan, 2021).

Research on the risk factors for the occurrence of hepatitis B in pregnant women in the Jakarta area in 2015 – 2016 identified the risk factors involved, including work in the formal sector, have had blood transfusions, have sex partners> 1, and live at home with Hepatitis B patients (Pratono, 2019), another study by Pither, et al. risk factors for hepatitis B in pregnant women in East Luwu district, namely education level, parity and partner sexual (Pither et al., 2021).

Hepatitis B virus can be transmitted through exposure to blood products and body fluids, one of which is through vertical transmission from mother to baby (Khalil et al., 2017; MacLachlan et al., 2015). Infants born to mothers with positive hepatitis B surface antigen (HBsAg) have a high risk of suffering from hepatitis B infection, especially in the first 5 years of life (Center for Disease Control and Prevention, 2022; World Health Organization (WHO), 2022). From these conditions can develop into chronic hepatitis B if without proper treatment around 25% of these babies can experience complications from hepatitis B such as liver failure, liver cancer and cirrhosis, hepatitis B virus carriers have a 100 times risk of developing hepatocellular carcinoma (Wong et al., 2014).

Hepatitis B medication on pregnancy must handle with many precaution, because the medication could gave side effect to the fetus, WHO already arranged guideline that include the recommendation for the antiviral prophylaxis in pregnant women as a prevention of vertical transmission from mother to baby (World Health Organization (WHO), 2020), although Hepatitis B was curable but there should be many aspect to consider for pregnant condition. The purpose of this research is to measure the prevalence of hepatitis B and its risk factors among pregnant women in Kupang City. There's a lack of study conducted to assessing hepatitis B prevalence among pregnant women in Kupang City also this study is more deep in finding the risk factor of Hepatitis spesifically on pregnant women in Kupang City which never done before or might have been done but unpublished, by understanding the magnitude of Hepatitis B cases in pregnant women and its risk factor could be a valuable information for the stake holders to take necessary policy to tackle this problem.

METHODS

This study was a descriptive qualitative study using cross-sectional design based on Hospital data collected during January – December 2021 (on covid-19 pandemic situation) data collected from patient medical record on Prof. Dr. W. Z. Johannes Kupang Hospital, we choose to collect data in a year to avoid duplication data. Population of this study were all pregnant women who underwent the HBsAg test (required test for all pregnant women due to triple elimination program by the government) in Prof. Dr. W. Z. Johannes Kupang Hospital as the referral government hospital in Kupang City, Sampling technique using consecutive sampling the sample size was 345 pregnant women, while pregnant women with HIV positive was excluded. HBsAg test performed by taking venous blood and trough centrifugation serum was obtained and serum was dripped onto HBsAg rapid test cassette and incubated for 5

minutes the double lines formed indicates the Hepatitis B positive, while single line meaning otherwise.

Variable on this study was sexual partner define as quantity of pregnant women sexual partner before and during pregnancy, age define as period of pregnant women life in years count since birth, gestational age is measure of the age of a pregnancy taken from the beginning of the woman's last menstrual period (LMP) and parity was the number of times a woman has given birth to a live neonate (any gestation) or at 24 weeks or more, regardless of whether the child was viable or non-viable (i.e. stillbirths). The information obtained was recorded into research form including all study variable, data collection held in hospital medical record unit with permission we access the pregnant women medical record data and recorded all data needed. Data collected was cleaned, coded, and uploaded into a computer using Statistical Package for the Social Sciences (SPSS) version 26 statistical software for analysis and interpretation. Descriptive values were expressed as the frequency and percentage while chi-square and fisher exact test was using to calculated the risk factors. This protocol was ethical approved by the ethical commission of Poltekkes Kemenkes Kupang number LB.02.03/1/0038/2022.

RESULTS

A total 345 pregnant women HBsAg testing data collected from medical record of Prof. Dr. W. Z. Johannes Kupang Hospital, and the respondent characteristic is described on table 1.

Table 1. Respondent's Characterictic of Pregnant Women In Prof. Dr. W. Z. Johannes Hospital Kupang, East Nusa Tenggara

Variables	n	%
Pregnant women's age		
Low risk age (≤35 yr)	288	83.5
High risk age (>35 yr)	57	16.5
Gestational Age		
Early preg. (<14 wks)	42	12.2
Late preg. (≥14 wks)	303	87.8
Sexual patner(s)		
1 person	333	96.5
>1 person	12	3.5
Parity		
≤3 times	329	95.4
>3 times	16	4.6
HBsAg Test Result		
Negative	277	80.3
Positive	68	19.7

Table 1 shows there is 68 from total 345 pregnant women who has a positive HBsAg result which mean they were expose or infected with hepatitis B virus, and it is calculate the prevalence of hepatitis B among pregnant women is 19.7% which consider high.

Table 2 shows the risk factor of Hepatitis B among pregnant women in Kupang City using non parametric test (chi-square and fisher exact), p-value shows that only sexual patners variable as the risk factor for hepatitis B among pregnant women in Kupang city (sig = 0.000; OR =53,26), while other variables like age, gestational age and parity is not the risk factors of hepatitis B among pregnant women.

Table 2. Risk Factors of Hepatitis B among Pregnant Women In Prof. Dr. W. Z. Johannes Hospital Kupang, East Nusa Tenggara

Variable	Hepatitis B				Sig	OR
	Neg		Pos			
	n	%	n	%		
Pregnant women's age						
Low risk age (≤35 yr)	229	79.5	59	20.5	0.471	0.73
High risk age (>35 yr)	48	84.2	9	15.8		
Gestational Age						
Early preg. (<14 wks)	35	83.3	7	16.7	0.682	1.26
Late preg. (≥14 wks)	242	79.9	61	20.1		
Sexual patner(s)						
1 person	276	82.9	57	17.1	0.000	53.26
>1 person	1	8.3	11	91.7		
Parity						
≤3 times	266	80.9	63	19.1	0.329	1.92
3 times	11	68.8	5	31.3		

DISCUSSION

This study found that most of pregnant women got the HBsAg test did not have high risk age (too young or too old), most of the pregnant women also have full term pregnancy (3rd trimester) which is safer to the deliver the baby, 96.5% pregnant women was having 1 sexual partner which consider at low risk of having communicable disease such as hepatitis B. the parity also dominated by normal parity as >3 times parity could put pregnant women in high risk of exposed to hepatitis b from the blood product, body fluid, any used delivery instrument or health facility contamination. This study found the prevalence of hepatitis b among pregnant women in Kupang city is consider high, this study was in line with of hepatitis among pregnant women in Jayapura and Sentani with prevalence 13% while the same study in Malang found prevalence is 8% (for anti-HBs positive) (Hasanah Syifa, 2018; Pangulu, 2018). While in other developing country the prevalence of hepatitis b among pregnant women was 6% in Ohana with prevalence 6%, 11.8% in Uganda, and 9.20% in Gambia (Antuamwine et al., 2022; Bayo et al., 2014; Bittaye et al., 2019). This finding shows that the hepatitis infection among pregnant women.

This finding indicates that prevalence of hepatitis B among pregnant women in Kupang city is higher than some reported prevalence in other region in Indonesia, this finding also higher than the national SIHEPI survey that conducted in 2018-2019 in 34 province in Indonesia which screened 1.643.204 pregnant women with HBsAg test and the result there were 30.965 (1,88%) positive infected with hepatitis b virus (Kementerian Kesehatan, 2019). Some of pregnant women with positive HBsAg result did not realize they got the disease because it is asymptomatic and most of them found the infection very late in the 3rd trimester of their pregnancy so the pregnant women did not having enough time to have proper treatment or medication, one of the confounding factor is the covid-19 outbreak that put the pregnant women in high risk of covid transmission that makes them afraid to visiting the healthcare for routine checkup and prefer to check up in private doctor practice which consider safer place.

The risk factor that associated with the hepatitis b among pregnant women in kupang city was having >1 sexual partners, this finding is in agreement with study conducted among pregnant women in DKI Jakarta that found that having >1 sexual partner is the risk factor of hepatitis B and pregnant women who have >1 sexual partner

having 21.4 times higher risk of hepatitis B (Pratono, 2019), the same finding was found in study done by Umare et al in east ethiopia also study by Eba et al in Nekemte town that concluded having multiple sexual partners was statistically associated with hepatitis B positivity (Eba et al., 2021; Umare et al., 2016). As one of sexual transmitted disease during sexual contact Hepatitis B Virus will migrate which increases with the duration of sexual activity and the number of sexual partners (Tesfu et al., 2023), moreover when it is unprotected and is done with multiple partners, the transmission rate will be increased (Alemu et al., 2020). The transmission of hepatitis B among pregnant women could be found from the sexual partners that might having connection to free sex, contact with body fluids such as blood, semen and vaginal mucus (Kenea & Lemessa, 2020). Study by Wakjira et al in 2022 found that mothers who has multiples sexual partners were around seven times more risk of having sero-positivity of HBsAg compared to those who had no multiples sexual partners (Wakjira et al., 2022)., while in contrary study in Makassar city in 2019 found sexual partner as protective factor from hepatitis b infection (Nurhidayati et al., 2019) this may happen because the sexual patners practicing safe sex e.g. using condom. Changes in sexual practice and behavior modification may therefore be an important step towards reduction of hepatitis B infection (Rabiu et al., 2010).

Other risk factor that assessed on this study were age, gestational age and parity, this study found those risk factor not significant associated with hepatitis B among pregnant women in kupang city, this finding has the same result with study done by Indriani and Anggraini on 2021 that the three risk factor did not associated with hepatitis B in pregnant women (Indriani & Anggraini, 2021), in other hand, study conducted by siwi ida et al in 2020 found that age, gestational age are the risk factor of hepatitis B on pregnant women.

This study also has limitations, such as the incomplete data that impact to the variety of variable that can be analysed, also the lack of hepatitis B vaccine history from pregnant mother that could be an impact factor to the prevalence of hepatitis B, we also found the data about household contact that might be another factor of hepatitis transmission.

CONCLUSION AND RECCOMENDATION

Conclusion of this prevalence of Hepatitis B among pregnant women in Kupang City was high, having more than one sexual partner was risk factor of pregnant women in Kupang City. It is recommended to encourage early detection of Hepatitis B on pregnancy. Health providers have to more proactive in screening process (HBsAg test on first visit to PHC), and providing a free vaccine on pregnant women to provide specific protection especially who have high risk.

ACKNOWLEDGMENTS

We would like to express our highest appreciation to the Director of Health Polytechnic of Kupang for giving us a chance to conduct our research. We acknowledge the Director of Prof. Dr. W. Z. Yohannes Kupang Hospital for their valuable cooperation during data collection. We would like to express our gratitude to all enumerators who participated in this study. We are also grateful to the Medical Laboratory Technology Department, Health Polytechnic of Kupang,for the facilitation and support for the study.

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