

Communication Infrastructure for the prevention of free sex behavior of adolescents in Bogor Regency, Indonesia



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Abstract Reproductive health education plays a crucial role in individual well-being. This study aims to explore the impact of free sex on reproductive health, with a specific focus on the increasing cases of HIV/AIDS. A proposed solution is the implementation of comprehensive sex education. The research objectives include examining the effects of early marriage on reproductive health, evaluating the prevalence of HIV/AIDS resulting from inadequate sex education, and assessing the effectiveness of comprehensive sex education. In terms of research methodology, a mixed-methods approach was employed, involving both surveys and in-depth interviews. The data analysis encompassed statistical methods and thematic qualitative analysis. The findings of the research indicate that early marriage contributes significantly to heightened reproductive health risks, closely associated with the prevalence of HIV/AIDS. Participants who underwent comprehensive sex education demonstrated a superior understanding of reproductive health and exhibited more favorable behavior, underscoring the positive role of such education in reducing risks. This study provides valuable insights into the impacts of early marriage and highlights the success of comprehensive sex education. The implications for policies and intervention measures are crucial for enhancing community well-being.

Keywords: comprehensive sex education, early marriage, HIV/AIDS, prevention of free sex

1. Introduction

Reproductive health and free sex remain challenges in every country around the world. These challenges include early marriage, maternal mortality due to childbirth when mothers are under twenty years old, and an increase in HIV/AIDS. A low understanding of sex makes the productivity of human resources in a country low so that the health and welfare needs of adolescents are not met. There are 111 million cases of sexually transmitted infections (STIs) worldwide, and 15% of new HIV cases occur among adolescents (Hubert *et al.* 2019). Adolescent girls are at risk for reproductive tract infections, social spectrum disorders, and psychological consequences such as quitting education, early marriage, unplanned pregnancies, unsafe abortions, and depression (Shankar *et al.*, 2017). Good and purposeful sex and reproductive education can play a central role in preparing young people for safe, productive, and fulfilling future lives (Ram and Mohammadenzhad 2020).

Reproductive education generally refers to the condition of physical, mental and social well-being as a whole in all matters related to reproductive systems, functions and processes, including the right and freedom to reproduce safely, effectively, appropriately, affordably and not against the law. Adolescent reproductive health has the scope of providing health services or care for women from premarital to pre-pregnancy, postpartum and abortion prevention. In addition, providing information or health education to adolescents about reproductive health (early sex education), sexually transmitted diseases due to free sexual relations, the dangers of drugs, young marriages, which can cause high maternal mortality rates, a lack of mental and psychological preparedness, and the impact of increasing divorce rates that can cause social problems (Darwin 2016).

Development carried out by a country will not succeed and will run optimally if it is not supported by quality human resources. The family becomes the first environment for the formation of high-quality human resources. The family is the smallest sociocultural institution in society and has a very large role in shaping children's behavior and in molding individual character. Family as a means to educate, nurture, introduce children to the surrounding environment, and develop the ability of all members to carry out their functions in society properly (BKKBN 2017).

Adolescence is a time of exploring sexuality issues. The period of appearance of the hormones at maturity. Teenagers are attracted to wasps of the opposite sex. At this time, adolescents seek and receive information from various sources. These



sources come from formal and informal sources. Formal sources were schools and health workers. Informal sources include parents, peers, and the media. Parents, peers, and the media most frequently rely upon informal sources of adolescent sexual health information (Akers *et al.* 2011; Wight and Fullerton 2013; Bleakley *et al.* 2018).

School is also an important environment for adolescent development. One of the roles of schools is to guarantee students' basic rights, such as obtaining knowledge and obtaining health knowledge. A school is a space that is crowded to develop educational strategies in an interactive and dynamic manner that will increase knowledge. In addition to the issue of free sex, the role of schools will help reduce various problems of free sex in adolescents (Bandeira *et al.*, 2016).

The role of schools in informing adolescents cannot be underestimated. Basically, sexual education is something that must be obtained by teenagers. This confirms that missteps in understanding sexual health can lead to deep disappointment with the future of adolescents. Reproductive health education involving school-based sex education, if well planned and delivered effectively, can improve health (O'Sullivan *et al.* 2019). In 2015, the United Nations Educational, Scientific and Cultural Organization (UNESCO) showed that most adolescents do not receive adequate and proper education and knowledge about sexuality, leaving them vulnerable to sexual abuse, sexually transmitted diseases and unwanted pregnancies (Razali *et al.* 2017).

In Indonesia, the issue of sexuality is still taboo. Society still views matters in which reproductive health must be discussed in a limited way (Angie *et al.*, 2021). Communication between parents and adolescents, as in developing countries, usually occurs behind closed doors. Teachers who provide sexuality lessons are still not optimal because there is no standardization of sexual education. Adolescents obtain sexual information through narration from the communication infrastructure that each teenager has. Communication infrastructure is a basic communication system that exists in the community and is relied upon by community members to obtain the information needed in daily life (Wilkin *et al.*, 2011). According to the theory of communication infrastructure, the life of adolescents is influenced by the surrounding environment. The neighborhood has a network of original stories made up of citizens, local community organizations, and local media. Storytelling systems consist of micro, meso-, and macrolevel actors who produce and disseminate information about the community. Microlevel agents are interpersonal networks that include family, friends, coworkers, and neighbors who share information about their daily lives, offer advice, and tell stories about the environment. Meso-level agents are smaller, community-based media and organizations that focus on a specific area or group of people. Delivery of adolescent reproductive health information at the micro level through schools. Macrolevel agents include all media, politics, religion, and other large institutions and organizations that have the capacity to tell stories about entire cities, nations, and the world for large audiences (e.g., cities, counties, regions) (Ball-Rokeach *et al.* 2001). In Indonesia, there has not been much research on how communication infrastructure affects adolescent free sex. The study used micro- and meso-level agents.

2. Materials and Methods

This study used a survey research design. The unit of analysis in this study was adolescents. The selection of research locations was carried out in a simple random manner through a lottery at a private vocational high school in Cibinong District. After the draw, the school determines the class to be taken as a sample through a draw. The location is based on the subdistrict that has the greatest number of marriages in Bogor Regency, which is 171,102 (Ruhendi, 2023). The first reason for sampling Class XI was that they had already received reproductive health education. Second, a better understanding of the body and reproductive functions is needed. The research methodology employed cluster random sampling (Figure 1). At the public senior high school, 4 students were absent. At the public vocational high school, 1 student was absent. At the private Islamic senior high school, 1 student was absent.

The communication infrastructure consists of micro, meso, and macro components. The questionnaire in this study refers to the book Predicting Health Belief Model (Abraham and Sheeran 2005), which has been adapted to the situation and conditions of Indonesia. The use of *Smart PLS* to examine the influence of micro, meso-, and macrolevels on the prevention of adolescent sex-free behavior.

Primary data were obtained from interviews using questionnaires that had been tested for validity and reliability. Information on the prevention of free sex from family, peers, and teachers is included among the microlevel agents. The free sex information derived from the media is categorized as meso-level agents. All questionnaires refer to the book Predicting Health Belief Model (Abraham and Sheeran 2005). The family information questionnaire consisted of information from fathers, mothers, and siblings and included 6 statements using a Likert scale ranging from 1 to 4 (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree), with a Cronbach's alpha of 0.901. The information questionnaire from the teacher consisted of 4 statements using a Likert scale ranging from 1 to 4 (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree), with a Cronbach's alpha of 0.835. A peer information questionnaire consisting of 8 statements measured using a Likert scale ranging from 1 to 4 (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly disagree) had a Cronbach's alpha of 0.765. The media information questionnaire consisted of 6 statement items and was measured using a Likert scale ranging from 1 to 4 (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree), with a Cronbach's alpha of 0.761. The action questionnaire consists of 10 items.

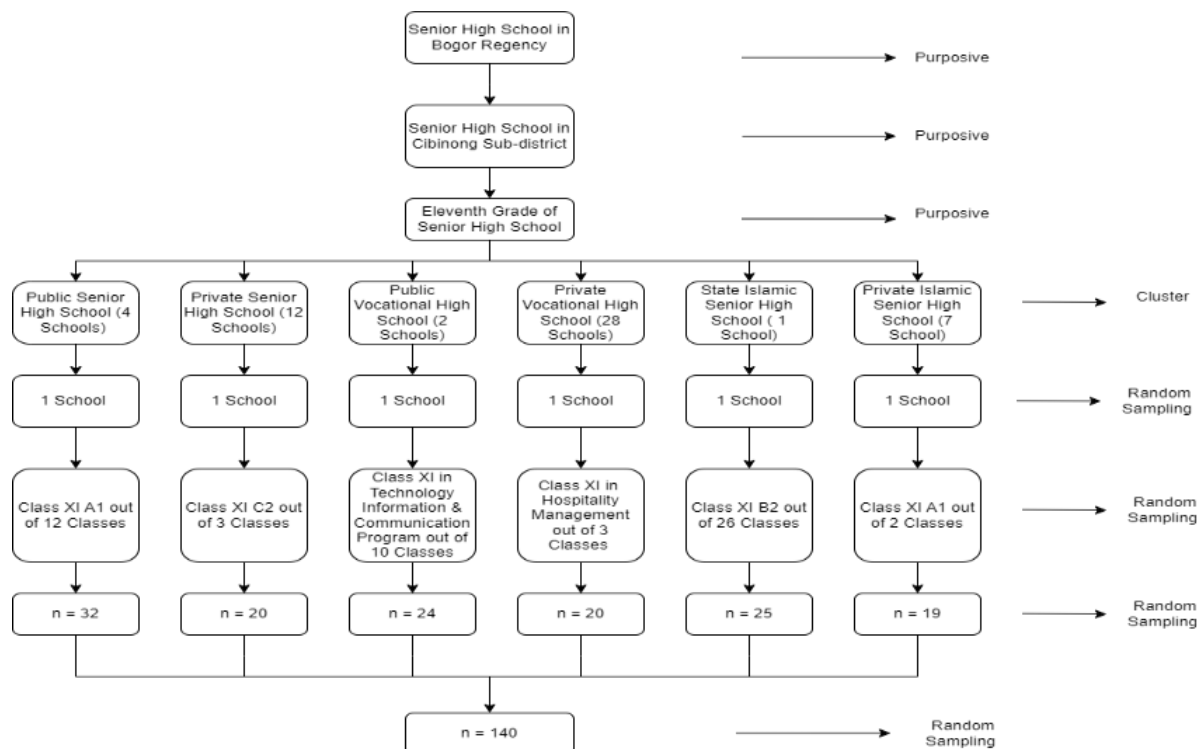


Figure 1 Sampling.

3. Results

This study used a quantitative approach and descriptive statistical analysis. Hypothesis testing using partial least squares (PLS) regression. The variables involved in this study are Family Information, Media Information, Peer Information, Teacher Information, and Action. PLS analysis is a multivariate analysis that estimates the influence between variables simultaneously with the aim of predictive studies, exploration or structural model development (Hair, 2019) (Figure 2).

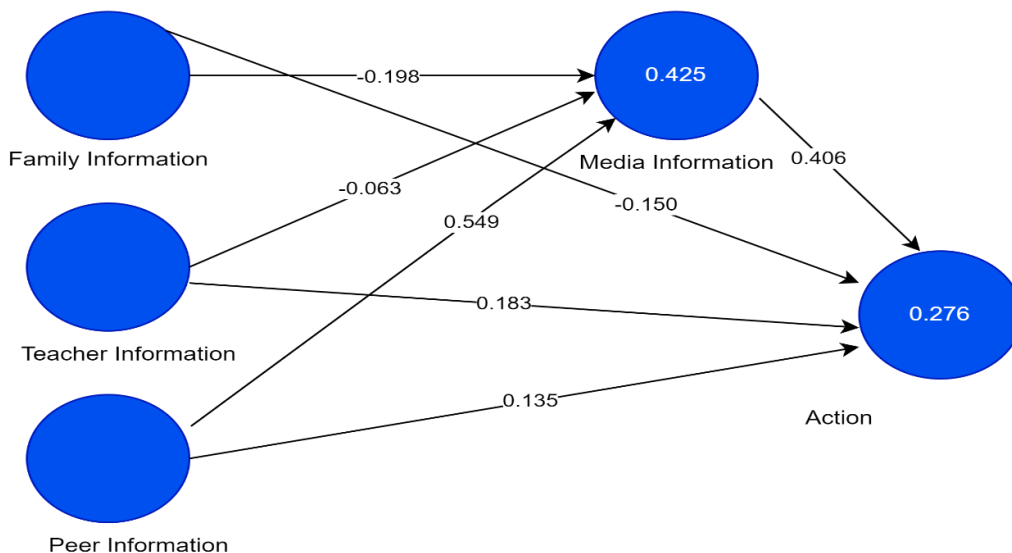


Figure 2 Outer Loading.

The table 1 has an outer loading above 0.70, which shows that the above measurements are valid for measuring variables. Indicators with outer loadings less than 0.70 are omitted because they are less valid in measuring variables. The measurement item that most closely reflects the measurement of the information variable of the family is FI3. The results showed that when information from families increased, it was reflected more strongly in the FI3 measurement items (in my family, mothers who were reminded not to impregnate/conceive out of wedlock). The measurement item that most highly reflects the measurement of variable information from the media is MI4. The results show that when information from the



media increases, it will be reflected more strongly on MI4 measurement items (I watch). The measurement item that most highly reflects the measurement of variable information from peers is PI5. The results showed that when peer information increased, it was reflected more strongly in the PI5 item (I watched with friends). The measurement item that most highly reflects the measurement of variable information from teachers is TI2. The results showed that as information from teachers increased, it was reflected more strongly in the TI2 measurement items (schools teachers warned of the dangers of free sex). The measurement item that most highly reflects the measurement of the action variable is A3. The results showed that when action increased, it reflected more strongly on the A3 item (I discussed sex issues with my friend).

Table 1 Outer Loading.

| Variabel | Measurement Items | Indicator | Outer Loading | Cronbach's Alpha | Composite Reliability | AVE |
|---------------------|-------------------|--|---------------|------------------|-----------------------|-------|
| Family Information | F11 | In my family, it was my mother who warned of the dangers of casual sex. | 0,777 | 0,911 | 0,931 | 0,692 |
| | F12 | In my family, it was my father who warned of the dangers of free sex. | 0,765 | | | |
| | F13 | In my family, the mother who reminded me not to impregnate/conceive out of wedlock. | 0,885 | | | |
| | F14 | In my family, the father who reminded me not to impregnate/get pregnant out of wedlock. | 0,867 | | | |
| | F15 | In my family, it was my mother who warned of the dangers of sexually transmitted diseases. | 0,867 | | | |
| | F16 | In my family, the father who warned of the dangers of sexually transmitted diseases. | 0,822 | | | |
| Media Information | M13 | I obtained information about pornographic films from mobile media. | 0,741 | 0,809 | 0,875 | 0,640 |
| | M14 | I watch porn. | 0,890 | | | |
| | M15 | I watch porn once a week. | 0,874 | | | |
| Peer Information | PI5 | I watch porn with friends. | 0,823 | 0,822 | 0,875 | 0,586 |
| | PI6 | It was my friend who introduced sex. | 0,733 | | | |
| | PI7 | It was my friend who influenced me to have casual sex. | 0,804 | | | |
| | PI8 | My friend forced me to have sex. | 0,815 | | | |
| Teacher Information | TI2 | At school teachers warn of the dangers of free sex. | 0,916 | 0,885 | 0,929 | 0,813 |
| | TI3 | At school, teachers remind you not to impregnate out of wedlock. | 0,912 | | | |
| | TI4 | At school teachers warn of the danger of sexually transmitted diseases. | 0,876 | | | |
| | | | | | | |
| Action | A2 | I am more of a believer in talking about sex issues with my friends. | 0,749 | 0,838 | 0,879 | 0,549 |
| | A3 | I discussed sex with my friend. | 0,814 | | | |
| | A6 | In the family, I discussed sex with my mother. | 0,741 | | | |
| | A7 | In the family, I discussed sex with my father. | 0,800 | | | |
| | A8 | In the family, I discussed sex with my sister. | 0,707 | | | |

3.1. Hypothesis Testing

This study used an alpha of 5% (two-sided) so that a t statistic greater than 1.96 or a p value less than 0.05 indicated that the hypothesis was accepted or that there was a significant influence. Multicollinary examination in statistical analysis, including PLS analysis, is important because multicollinaries can cause biased parameter estimates, large standard error values, wide confidence distances, estimated path coefficients, and even affect the significance of hypothesis testing. The values of the outer variance inflation factor (VIF) range from 1,352-3,893. This value is lower than the recommended value of 5 (Diamantopoulos and Siguaw, 2006; Hair et al., 2017). To determine discriminant validity, the heterotrait-monotrait ratio (HTMT) is used because it has a higher level of sensitivity in detecting discriminant validity (Henseler and Sarstedt, 2014). Table 2 shows that the value of the variable pair is less than 0.90, which shows that the variable has good discriminant validity.

Table 2 HTMT.

| | Action | Family Information | Media Information | Peer Information | Teacher Information |
|---------------------|--------|--------------------|-------------------|------------------|---------------------|
| Action | | | | | |
| Family Information | 0.247 | | | | |
| Media Information | 0.545 | 0.407 | | | |
| Peer Information | 0.413 | 0.264 | 0.734 | | |
| Teacher Information | 0.208 | 0.594 | 0.337 | 0.250 | |

According to the path coefficient of the table 3, the influence of family information on action is -0.150 and is not significant, with a t statistic of 1.691 ($1.691 < 1.96$) or a p value of $0.091 > 0.05$. This hypothesis was rejected. Changes in family information did not significantly increase adolescent action toward free sex prevention. The influence of family information on media information is -0.198 and significant, with a t statistic of 2.065 ($2.065 > 1.96$) or a p value of $0.039 < 0.05$. This hypothesis is accepted. Any change in family information will significantly increase the use of adolescent information media. The influence of media information on action is 0.406 and significant, with a t statistic of 5.009 ($5.009 > 1.96$) or a p value of $0.000 < 0.05$. This hypothesis is accepted. Any change in information media variables will significantly increase adolescent action. The effect of peer information on action was 0.135 and was not significant, with a t statistic of 1.854 ($1.854 < 1.96$) or a p value of $0.064 > 0.05$. This hypothesis was rejected. Any change in the peer information variable does not significantly increase action. The effect of peer information on information media is 0.549 and significant, with a t statistic of 6.979 ($6.979 > 1.96$) or a p value of $0.000 < 0.05$. This hypothesis is accepted. Any change in peer information variables will increase the use of media information by adolescents. The effect of teacher information on action was 0.183 and was not significant, with a t statistic of 1.779 ($1.799 < 1.96$) or a p value of $0.075 > 0.05$. This hypothesis was rejected. Any change in teacher information variables will not significantly increase action. The effect of teacher information on media information is -0.063 and is not significant, with a t value of 0.745 ($0.745 < 1.96$) or a p value of $0.456 > 0.05$. This hypothesis was rejected. Changes in teacher information variables did not significantly increase the use of media information among adolescents.

The mediation variables explain that there are variables that are among the influences of one variable on other variables.

Table 3 Hypothesis Testing Table (Path Coefficients and Statistical T).

| | Original Sample | T Statistic | P Value | Decision |
|---|-----------------|-------------|---------|-------------|
| Family Information → Action | -0.150 | 1.691 | 0.091 | Not Support |
| Family Information → Media Information | -0.198 | 2.065 | 0.039 | Support |
| Media Information → Action | 0.406 | 5.009 | 0.000 | Support |
| Peer Information → Action | 0.135 | 1.854 | 0.064 | Not Support |
| Peer Information → Media Information | 0.549 | 6.979 | 0.000 | Support |
| Teacher Information → Action | 0.183 | 1.779 | 0.075 | Not Support |
| Teacher Information → Media Information | -0.063 | 0.745 | 0.456 | Not Support |

Media information did not significantly mediate the influence of family information on action, with a mediation path coefficient of -0.080, and was nonsignificant, with a t statistic of 1.840 ($1.840 < 1.96$) and a p value of $0.066 > 0.05$ (Table 4). Media information significantly mediated the influence of peer information on action, with a mediation path coefficient of 0.223 and a t value of 3.962 ($3.962 > 1.96$), p value of $0.000 < 0.05$. Media information did not significantly mediate the influence of teacher information on action, with a mediation path coefficient of -0.026, and was not significant, with a t statistic of 0.731 ($0.731 < 1.96$) and a p value of $0.465 > 0.05$.

Measurement of effect size mediation using epsilon statistics. The results of the epsilon statistical calculation showed that 0.175 had a strong mediating effect, 0.075 had a moderate mediating effect, and 0.01 had a weak mediating effect. The results of the mediation effect size are shown in the Table 5.



Table 4 Mediation Test Table.

| | Original Sample | T Statistic | P Value | Decision |
|--|-----------------|-------------|---------|-------------|
| Family Information→Media Information→Action | -0.080 | 1.840 | 0.066 | Not Support |
| Peer Information→Media Information→Action | 0.223 | 3.962 | 0.000 | Support |
| Teacher Information→Media Information→Action | -0.026 | 0.731 | 0.465 | Not Support |

Table 5 Effect Size Mediasi.

| No | Effect | Upsilon Statistic (v) | Decision |
|----|--|---------------------------------------|----------------------|
| 1 | Family Information→Media Information→Action | $(-0.198)^2 \times (0.406)^2 = 0.007$ | Low mediation effect |
| 2 | Peer Information→Media Information→Action | $(0.549)^2 \times (0.406)^2 = 0.050$ | Low mediation effect |
| 3 | Teacher Information→Media Information→Action | $(-0.063)^2 \times (0.406)^2 = 0.001$ | Low mediation effect |

4. Discussion

The purpose of this study was to examine the influence of family, media, peer, and teacher information on adolescent free sex prevention. The results of this study show that communication with family is very important for adolescents to prevent adolescent sex-free behavior. This finding is consistent with existing research showing that child–parent attachment prevents promiscuous sexual activity, which is particularly risky (Soh et al., 2018). Parents communicate more about sexuality to teenagers about the negative effects of sexual activities. Parents lack discussion of positive topics such as sexual satisfaction (Evans et al., 2020). According to the results of this study, parents never or rarely discuss sexuality problems with adolescents. Perhaps parents who are ignorant of parental sexual education or who are parents feel ashamed to convey sexual education to their teenagers. Parental monitoring, family communication, and parenting styles are parental controls on adolescent sexuality. Specifically, parental communication to adolescents includes warm communication, balanced communication, and good parenting to protect adolescents from sexual activities (Bianchi et al., 2019). However, when adolescents have conflicts with their parents, they choose to spend more time using media than discussing with their parents (Santrock, 2019). The internet is the main source of information for adolescents about sexuality (Werner-Wilson et al., 2004). This leads adolescents to actively use electronic media. The high use of the internet (media) by adolescents can increase adolescent pornography or sexual behaviors (Laili et al., 2018).

Communication with parents influences adolescent decision-making. Difficulty communicating with parents can increase early sexual activity in adolescents. Some studies have shown that good communication, good relationships, and closeness with parents are major factors that can protect adolescents (Buhi & Goodson, 2007). The more open parents are to adolescents, the more adolescent pornography/sexual behaviors decrease. However, it is not easy for adolescents to communicate with their parents. Adolescents feel that they have difficulty communicating about sexual health issues with their parents. Generally, parents tend not to answer questions from adolescents about sexual health (Laili et al., 2018).

Friends for teenagers have a role that goes beyond their parents in discussing sexuality issues. According to the results of this study, adolescents discuss sexuality more with friends than with their parents. The sexual behavior of adolescents is highly responsive to peer influence (Peçi, 2017). In media use, friends usually play a completely different role than parents do. Lam and Chan found in their study of 229 young Chinese men in Hong Kong that

Online pornography is strongly correlated with peer influence and pressure (Lam and Chan 2007).. Lam and Chan's research aligns with the results of this study that peers are very dominant in influencing adolescents' sexuality. Schools are important as a deterrent to free sex. However, this study revealed that school is not the main way for adolescents to obtain sex education. Teenagers generally do not have access to discussion about their sexuality. Teenagers generally seek themselves through the media. Teachers also have no role in the development of adolescent sexuality. According to the results of Adekola and Mavhandu-Mudzusi's research, an educator must improve skills in teaching sexual education to his students (Adekola and Mavhandu-Mudzusi 2022). Having good skills is an important factor in the delivery of quality and effective sexual education (Bonjour and Vlugt 2018).

School environments are also crucial for adolescent development. One of the roles of schools is to ensure the basic rights of students, such as acquiring knowledge and obtaining health-related information. Schools provide adequate space for developing interactive and dynamic educational strategies that will have an impact on knowledge enhancement. Furthermore, concerning reproductive health issues, the role of schools will help reduce various reproductive health problems (Bandeira et al., 2016).



5. Conclusion

Reproductive health and free sex, including early marriage, the risk of young maternal mortality, an increase in HIV/AIDS, and low understanding of sex, remain serious challenges worldwide. Adolescent girls are at high risk of experiencing negative consequences, such as reproductive tract infections, social impacts, and psychological consequences, such as quitting school, early marriage, unplanned pregnancy, unsafe abortion, and depression. Good, purposeful sex and reproductive education can play a central role in preparing adolescents for safe, productive, and fulfilling lives. The family becomes the first environment in which quality human resources are formed. The role of the family is very large in shaping the behavior of children and individual character. Adolescence is a time of exploration of sexuality issues in which hormones of maturity appear, and adolescents seek information from a variety of sources, both formal and informal. Schools play an important role in providing sexual education. The presence of well-trained teachers is considered an important factor in the delivery of quality and effective sexual education. Peers and the media have a major influence on adolescent sexual behavior. Peers can influence positively or negatively, whereas the media, if not properly regulated, can provide inappropriate information. Sex education policies and programs should take into account the roles of families, schools, teachers, peers, and the media. Training for educators is key in improving the quality of sexual education in schools.

6. Recommendations

Efforts are needed to increase the role of families in providing sexual education to adolescents. Better training and information for parents can help create a supportive environment. Teachers need to receive adequate training in delivering sexual education materials. The role of schools in providing accurate information and educating adolescents about the impact of free sexual behavior should be strengthened. The need for counseling and supervision of the media, especially content, has the potential to have a negative impact on adolescents. Partnerships between schools and media can help create a balanced understanding. Empowering peers who have a positive understanding of sexuality to become agents of change and provide positive support to youth. Therefore, sex education needs to be delivered appropriately in adolescence. Sexual counseling and education programs should be tailored to the physical and emotional development of adolescents. The development of a sex education curriculum that is in accordance with local values and culture and accommodates the development of technology and information. Further research on the impact of communication infrastructure on adolescent sex-free behavior in Indonesia is needed to provide a basis for a better and more detailed understanding of this topic. Governments and relevant organizations need to be actively involved in developing effective and relevant sex education policies and programs to address adolescent reproductive health challenges.

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Ethical considerations

The article does not explicitly mention details about the ethical permission obtained for conducting the study. Ethical considerations in research involving sensitive topics such as adolescent sexual behavior and health are crucial, including obtaining informed consent, maintaining confidentiality, and ensuring participants' well-being throughout the study.

Conflict of Interest

The article does not explicitly mention any conflicts of interest. However, in research concerning sensitive issues such as adolescent sexual health, it is essential to disclose any potential conflicts of interest, financial or nonfinancial, to ensure the study's integrity and objectivity. This abstractive summary provides an overview of the application of the HBM to explore adolescents' perceptions of free sex in Indonesia, highlighting both the strengths and limitations of the study while addressing ethical considerations and potential conflicts of interest.

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