

PROACTIVE COGNITIVE GAME METHOD FOR PERSONS WITH DISABILITIES TO PREVENT EARLY MARRIAGE IN BOGOR CITY

*Metode Game Kognitif Proaktif pada Penyandang Disabilitas untuk Mencegah
Pernikahan Dini di Kota Bogor*

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ABSTRAK

Individu dengan disabilitas sering mengalami keterbatasan dalam memahami kesehatan reproduksi akibat rendahnya pendidikan reproduksi serta terbatasnya akses terhadap layanan dan informasi terkait seksualitas. Oleh karena itu, diperlukan metode edukasi yang sesuai dan mudah dipahami. Salah satu pendekatan yang efektif adalah pembelajaran yang bersifat interaktif dan partisipatif, seperti game kognitif proaktif. Penelitian ini bertujuan untuk menganalisis pengaruh edukasi kesehatan reproduksi menggunakan metode game kognitif proaktif terhadap peningkatan pengetahuan remaja penyandang disabilitas di Kota Bogor. Penelitian menggunakan desain kuasi-eksperimen dengan kelompok intervensi dan kelompok kontrol. Studi dilaksanakan pada tahun 2024 di Kota Bogor dengan populasi remaja penyandang disabilitas sebanyak 1.058 orang. Sampel dipilih secara purposive sampling, terdiri atas 60 responden, dengan 30 orang pada kelompok intervensi dan 30 orang pada kelompok kontrol. Kelompok intervensi diberikan edukasi kesehatan reproduksi melalui game kognitif proaktif, sedangkan kelompok kontrol memperoleh edukasi dengan metode konvensional. Pengumpulan data dilakukan melalui observasi dan kuesioner pre-test dan post-test. Analisis data menggunakan uji Mann-Whitney karena data tidak berdistribusi normal. Hasil penelitian menunjukkan adanya pengaruh signifikan edukasi kesehatan reproduksi melalui game kognitif proaktif terhadap peningkatan pengetahuan remaja putri mengenai dampak pernikahan dini. Karakteristik remaja penyandang disabilitas pada dasarnya serupa dengan remaja tanpa disabilitas, dengan tingkat kecerdasan yang setara, meskipun memiliki keterbatasan pada aspek kemampuan verbal. Oleh karena itu, disarankan penggunaan metode edukasi yang interaktif dan menarik untuk meningkatkan efektivitas pendidikan kesehatan pada remaja.

Kata kunci: disabilitas, game kognitif proaktif, pengetahuan

ABSTRACT

Individuals with disabilities often experience limitations in understanding reproductive health due to low levels of reproductive health education and limited access to sexuality-related services and information. Therefore, appropriate and easily understood educational methods are needed. One effective approach is interactive and participatory learning, such as proactive cognitive games. This study aimed to analyze the effect of reproductive health education using a proactive cognitive game method on improving the knowledge of adolescents with disabilities in Bogor City. A quasi-experimental design was employed with an intervention group and a control group. The study was conducted in 2024 in Bogor City, involving a population of 1,058 adolescents with disabilities. Samples were selected using purposive sampling, consisting of 60 respondents, with 30 participants in the intervention group and 30 in the control group. The intervention group received reproductive health education through proactive cognitive games, while the control group received education using conventional methods. Data were collected

through observation and pre-test and post-test questionnaires. Data analysis was performed using the Mann–Whitney test due to non-normally distributed data. The results showed a significant effect of reproductive health education delivered through proactive cognitive games on increasing adolescent girls' knowledge regarding the impacts of early marriage. Adolescents with disabilities generally share similar characteristics with adolescents without disabilities, including comparable levels of intelligence, although they experience limitations in verbal abilities. Therefore, the use of interactive and engaging educational methods is recommended to enhance the effectiveness of health education for adolescents.

Keywords: disability, game cognitive proactive, knowledge

INTRODUCTION

The phenomenon of early marriage rates is followed by the vulnerability of disabled teenagers in early marriage. From this phenomenon, there is a gap/lack of education about the impact of early marriage, so that a new educational technique/game has emerged with the "proactive cognitive game" method for people with disabilities, especially those with speech impairments. From this phenomenon, what educational gaps/deficiencies exist, thus giving rise to new educational/games that are different from "proactive cognitive games." WHO defines early marriage as marriage under the age of 19, while UNICEF defines child marriage as under the age of 18. In Indonesia, the prevalence of child marriage has decreased, but the figure remains high, with 11.2% of girls married under 18[1].

The ten countries with the highest rates of child marriage are predominantly from Asia and Africa. Globally, an estimated girl marries every 3 seconds, indicating that the practice of child marriage remains widespread in many countries.[2]UNICEF notes that in South Asia, including India, the prevalence of child marriage is quite high, with most girls marrying before the age of 18. Furthermore, Indonesia also faces a major challenge regarding early marriage as a public health issue. In Indonesia alone, tens of millions of girls enter marriage before the age of 18, with a significant prevalence in various provinces, especially among children with low education, where many marry while still in primary or junior high school. This practice has an impact on the education, reproductive health, and well-being of young women in Indonesia[3].

The social stigma that exists in today's society tends to be negative, which can indirectly impact children's social lives, mental health issues, and overall quality of life. Stigma can also stem from social norms that prioritize perfection and physical ability. Children with disabilities are often perceived as "different" in certain situations and as not conforming to societal standards, which can lead to marginalization. Stigma can hinder children with disabilities' access to education, health services, and other social opportunities, according to this study[4]. Barriers to accessing reproductive health information and services result in relatively low levels of knowledge for this group. However, the reproductive maturity of adolescents with disabilities is comparable to that of adolescents without disabilities, so the risk of early marriage and its impacts remains high[5].

Cooperative and interactive learning methods, including proactive cognitive game approaches, are considered effective in increasing adolescent knowledge. These games involve participatory discussions on cases related to early marriage, encouraging participants to think critically and draw their own conclusions about the impacts. This study aims to analyze the effect of providing reproductive health education using proactive cognitive game methods on improving the knowledge of adolescents with disabilities in Bogor City.

METHODS

This study used a quasi-experimental design, comparing an intervention group with a

control group. The independent variable was reproductive health education using a proactive cognitive game method, while the dependent variable was the knowledge of adolescents with disabilities. This method is expected to provide an alternative in providing reproductive health and sexuality education to adolescents.

The study was conducted in Bogor City from August to November 2024. The study population included all 1,058 adolescents with disabilities in Bogor City. The study sample consisted of 60 respondents attending special education foundations in Bogor City. Sampling was conducted using a purposive sampling technique, with inclusion criteria being healthy adolescents with speech impairments and exclusion criteria being sick adolescents with speech impairments. The sample consisted of 30 respondents in the intervention group and 30 respondents in the control group. The intervention group received reproductive health education using a proactive cognitive game in three 60-minute sessions. The control group received education using lectures and question-and-answer sessions for the same number and duration.

Data collection was conducted through observation and questionnaires. The research instruments consisted of pre-test and post-test questionnaires regarding knowledge about the impacts of early marriage. Data analysis was performed using the Mann–Whitney test because the dependent variable data were not normally distributed. The results showed a significant effect of providing health education through proactive cognitive games on increasing adolescent girls' knowledge about the impacts of early marriage.

Instrument validity was tested using Spearman's Rank Test with an r value > 0.3 , and reliability was tested using Cronbach's Alpha with an alpha value > 0.05 . This study has obtained ethical approval under No. 21/KEPK/EC/X/2024 and was declared ethically sound. In general, the characteristics of adolescents with disabilities are similar to those of adolescents without disabilities, with similar levels of intelligence but limitations in verbal abilities.

RESULT

Respondent Characteristics

After data collection, the respondent data were found to be as in Table 1 below:

Table 1. Respondent Characteristics Based on Intervention and Control Groups					
Variables	Category	Intervention (n)	Control (n)	Total (n)	p-value
Age (years)	15	2	4	6	0.81
	16	6	6	12	
	17	10	12	22	
	18	4	3	7	
	19	8	5	13	
	Total	30	30	60	
Mother's Education	Elementary School	15	17	32	0.48
	Junior High School	5	11	16	
	Senior High School	10	12	22	
	Total	30	30	60	
Resources	Print media	8	15	23	0.20
	Electronic media	20	15	35	
	Health workers	2	0	2	
	Total	30	30	60	
Mother's Employment Status	Housewife	7	12	19	1.00
	Work	23	18	41	

Variables	Category	Intervention (n)	Control (n)	Total (n)	p-value
Having a Boyfriend	Total	30	30	60	0.370
	Yes	21	10	31	
	No	9	20	29	
Dating History	Total	30	30	60	0.152
	Yes	28	30	58	
	No	2	0	2	
Family Knowledge	Total	30	30	60	0.172
	No	10	6	16	
	Yes	20	24	44	
	Total	30	30	60	

Table 1 shows that in both the intervention and control groups, the majority of respondents were 17 years old, their mothers were educated in elementary school, their sources of information about reproductive health were electronic media, their mothers were employed, they were currently in a relationship, they had a girlfriend, they had been in a relationship, and their families knew that they were in a relationship. The analysis using the Lambda contingency coefficient test showed a p-value > 0.05. This finding indicates that there is no relationship between respondent characteristics and the knowledge of adolescents with disabilities about the impact of early marriage.

Before providing education to both the intervention and control groups, a pretest was conducted to determine respondents' initial knowledge regarding the impact of early marriage. After the intervention was implemented in both groups, a posttest was conducted to assess the extent to which respondents' knowledge of the impact of early marriage among adolescents with disabilities had changed. The results of the pretest and posttest on the knowledge of adolescents with disabilities regarding the impact of early marriage are shown in Table 2.

Table 2. Respondents' Knowledge of the Impact of Early Marriage

Group	N	Mean	Range	SD
Pre-test				
Intervention (Cognitive Game)	30	24.53	16–33	4.309
Control (CTJ)	30	20.50	14–33	4.495
Post-test				
Intervention (Cognitive Game)	30	28.28	19–35	4.157
Control (CTJ)	30	21.73	14–34	4.344

Table 2 shows an increase in the mean knowledge score in the intervention group after receiving the cognitive game, from 24.53 in the pre-test to 28.28 in the post-test (an increase of 4 points). Meanwhile, the control group showed a smaller increase of 1.23 points, from 20.50 to 21.73. This indicates that the improvement in knowledge was greater in the intervention group than in the control group.

Table 3. Changes in Respondents' Knowledge Scores Before and After the Intervention

Score Change	Control (CTJ)	Intervention (Cognitive Game)
Negative Rank (Post-test < Pre-test)	3	0
Positive Rank (Post-test > Pre-test)	16	28
Ties (Post-test = Pre-test)	11	2
Total	30	30

Table 3 shows that in the control group, 3 respondents experienced a decrease in post-test scores compared to pre-test scores. In contrast, no respondents in the intervention group experienced a decline. A total of 28 respondents in the intervention group showed an increase in knowledge scores, compared to only 16 respondents in the control group, indicating the effectiveness of the cognitive game intervention.

Table 4. Mann–Whitney Test Results on Respondents' Knowledge

Group	N	Median	Mean ± SD	p-value
Cognitive Game	30	29	28.28 ± 4.157	0.000*
CTJ	30	21	21.79 ± 4.33	

*Note: * statistically significant at $\alpha = 0.05$*

Table 4 shows a p-value of 0.000 (< 0.05), indicating a statistically significant difference in knowledge between the intervention and control groups. Therefore, it can be concluded that the cognitive game intervention significantly improves respondents' knowledge regarding the impact of early marriage.

DISCUSSION

Early marriage is a marriage that occurs at a lower age than the legal age, when physical, mental, and material preparation is not yet fully developed. After the data is processed and presented along with the results, the next stage is a discussion tailored to the research variables, as follows.

Respondent Characteristics

From the results of the Lambda test analysis, no significant differences in characteristics were found between the intervention group and the control group, so it can be stated that there is no significant relationship between the characteristics of the respondents (age, mother's education, mother's occupation, sources of reproductive health information, history of having a boyfriend, status of having a boyfriend, and family involvement in knowing the respondent's dating status).

According to Heri Purwanto in the book *General Orthopedagogy*, speech impairment is a condition where a person experiences a disturbance in language articulation or voice quality that deviates from normal speech patterns, thus causing obstacles in communicating verbally in their surroundings[6]. In general, children with speech impairments do not have characteristics that differ from those of children in general, except in terms of language and speech abilities. Children with speech impairments generally show delays in language and speech development compared to children with normal speech development[5].

The reproductive health education provided did not correlate with the respondents' age, as all respondents were in the same age range, namely mid-adolescence. Neither maternal education nor occupation was associated with respondents' level of knowledge regarding the impact of early marriage. This is likely influenced by the availability of various other sources of information related to early marriage, which are easily accessible in today's digital age. One of the main factors driving adolescents to premarital sex is exposure to pornographic content, both through reading material and films. This situation has the potential to lead to pregnancy outside of marriage, which then encourages adolescents to choose marriage at a young age. Some adolescents believe that early marriage is a way to avoid behaviors considered sinful, such as premarital sex. During adolescence, the search for self-identity becomes crucial, namely, understanding who one is and what role one will play in society[5].

Teenagers tend to be dissatisfied with being treated the same as others, as they seek to assert their individual identity while simultaneously striving to maintain acceptance within their peer group. Negative stigmas often arise in society, such as being seen as untidy, untrustworthy, or prone to destructive behavior. This perception leads adults to

feel the need to constantly monitor and guide their lives. However, this stigma can complicate the transition from adolescence to adulthood, as parental suspicions can actually lead to conflict and widen the gap between them and their children[7].

Adolescents with disabilities face various barriers in obtaining information about health, sexuality, and reproduction. Disability groups have tended to be overlooked in health intervention programs, particularly those related to reproduction and sexuality, because the primary focus has been on people without disabilities. Yet, reproductive organ maturity and sexual function in individuals with disabilities are not significantly different from those without disabilities[8]

Parents play a crucial role in providing children with an understanding of reproductive health. This education is expected to prevent children from engaging in premarital sexual behavior, which can lead to early marriage. Early marriage undermines children's right to a decent standard of living[9].

Changes in Respondents' Pre- and Post-Test Scores

Tables 2 and 3 showed that 28 respondents in the intervention group had post-test scores higher than their pre-test scores, while only 16 respondents in the control group had post-test scores higher than their pre-test scores. Overall, before statistical testing, it was clear that the intervention resulted in improved post-test scores.

These findings align with research conducted by Anik Sulistyowati at SMA Negeri 2 Demak, with a population of 140 female students and a sample of 59. The results showed that the majority of young women (28 students, 47.5%) had good knowledge about the risks of early marriage and pregnancy, while 9 students (15.3%) had less knowledge[10].

Respondents' knowledge levels were considered quite good, as information and communication regarding the risks of early marriage on pregnancy were readily accessible. This information came from various media sources and was reinforced by communication with parents. However, some young women still did not fully understand the risks of early marriage on pregnancy, as a small number of them considered it unnecessary to know the consequences[11]. In line with the opinion of Rahayu et al., the intelligence quotient (IQ) of children with disabilities is generally no different from that of children without disabilities, only that verbal IQ scores tend to be lower than performance IQ. Early marriage often occurs during puberty, because adolescents are in a phase vulnerable to sexual behavior. In addition, early marriage also often occurs due to the mindset of adolescents who are still emotional, so they think that mutual love is enough to be ready for marriage. Another factor that contributes to early marriage is the practice of arranged marriages carried out by parents, which usually arises due to dropping out of school or the family's economic situation[5].

Influence Proactive Cognitive Games on Respondents' Knowledge

The results showed that cognitive game intervention affected increasing respondents' knowledge about the impact of early marriage ($p < 0.05$). According to Wood, health education can be understood as a series of experiences that support the formation of habits, attitudes, and knowledge related to the health of individuals, communities, and specific races[12]. Meanwhile, Setiawati and Dermawan explained that health education is a planned effort aimed at influencing individuals, families, groups, and communities to be able to implement healthy lifestyle behaviors[13].

Developing cooperative and interactive learning methods is effective in increasing the knowledge of students with disabilities. Cooperative methods, using a cognitive-proactive game approach, are one strategy for providing reproductive health and sexuality education to adolescents. This educational process is conducted through games that involve active participation in discussions about a case study related to the impact of early marriage, based on cognitive-proactive principles[13].

The goal of health education is to help individuals, families, and communities achieve

optimal health through their own desires and initiatives. Changes in health behavior following health education can help prevent disease and disability. The primary goal of health education is to change health behavior and improve health status[13].

In the control group, the method used to provide health education was a lecture with a question-and-answer approach. The lecture method is one of the simplest and most commonly used methods in the education process. In this method, the instructor acts as the transmitter of information, while the students act as the receivers. Communication is carried out through language, both verbal and nonverbal, which serves as the primary medium for conveying messages or ideas. Communication is considered effective if the message is fully received by the recipient. Conversely, communication is considered less effective if the message received differs from the sender's intent. The lecture method tends to be more appropriate for audiences with higher levels of education[14].

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The cognitive-proactive game education method is one approach to reproductive health and sexuality education for adolescents. This activity is implemented through games based on case discussions related to reproductive issues or deviant sexual behavior, based on cognitive-proactive principles. This principle encourages adolescents to actively identify the positive and negative aspects of reproductive health and sexuality issues, allowing them to conclude for themselves whether the behavior is appropriate or not[15].

CONCLUSION

In the intervention and control groups, the majority of respondents were 17 years old, had a mother with an elementary school education, obtained reproductive health information from electronic media, had a working mother, had been or were currently in a relationship, and their families were aware of the respondents' dating status. The characteristics of adolescents with disabilities were essentially the same as those of adolescents in general, although they had limitations in verbal abilities. Providing health education through the cognitive-proactive game method in the intervention group showed an average increase in knowledge of 4 points, from 24.53 to 28.28, while the control group only experienced an increase of about 1 point. These results indicate that the cognitive-proactive game method is more effective in increasing the knowledge of adolescent girls about the impact of early marriage. Statistical tests also showed a significant effect of the intervention on increasing knowledge ($p < 0.05$). It is recommended that adolescent health education optimize the use of interactive and interesting learning methods to increase the effectiveness of achieving the expected results.

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