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Relationship between Young Women's Reproductive Health Knowledge, Attitude and Self-efficacy in Luwero District, Uganda

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우간다 루웨로 지역 젊은 여성의 성생식보건 지식, 태도 및 자기효능감 간의 관련성

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Abstract This study explored the link between reproductive health knowledge, attitudes, and self-efficacy in young women from Uganda's Luwero district. A survey was conducted on 82 women in the Luwero region from May to July 2016, and the predictive power of knowledge and attitudes toward self-efficacy was evaluated through multiple linear regression analysis. Results showed positive correlations among these factors, with knowledge and attitude predicting self-efficacy. Specifically, understanding healthy puberty habits and valuing women's roles positively influenced self-efficacy for healthy behaviors. These findings emphasize the need to target these aspects in reproductive health education programs, crucial for addressing adolescent pregnancy and related issues in Uganda's rural areas.

Key Words : Reproductive health, Knowledge, Attitude, Self-efficacy, Adolescents, Uganda

요 약 본 연구는 우간다 루웨로 지역의 젊은 여성들 사이에 성생식보건 지식, 태도, 자기효능감의 관계를 조사했다. 2016년 5월부터 7월까지 루웨로 지역의 여성 82명을 대상으로 설문조사를 실시했으며, 다중 선형 회귀 분석을 통해 자기효능감에 대한 지식과 태도의 예측력을 평가했다. 연구 결과 참가자 중 48.8%가 16-17세였으며, 지식, 태도, 자기효능감 사이에 유의한 상관관계가 있었다. 또한, 지식과 태도는 자기효능감의 59.6%를 설명했으며, 모두 자기효능감을 예측하는 데 유의한 역할을 했다. 연구 결과는 건강한 활동에 참여하는 자기효능감과 여성의 역할과 가치에 대한 긍정적 태도, 청소년기 건강 유지에 대한 지식 간의 관련성을 강조한다. 이를 토대로 향후 교육 프로그램은 이러한 요소를 강화하여 우간다의 청소년 임신 및 성생식보건 문제에 대응해야 할 것이다.

주제어 : 성생식보건, 지식, 태도, 자기효능감, 청소년, 우간다

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1. Introduction

Based on data from the Uganda Demographic Health Survey, around a quarter of young women between the ages of 15 and 19 in Uganda are either currently pregnant with their first child or have already experienced childbirth[1]. Adolescent pregnancy has significant implications for the overall well-being of women and their children[2,3]. The problem of teenage pregnancy is exacerbated by limited availability of reproductive services and contraceptives[4,5]. Insufficient knowledge about reproductive health and negative attitudes toward contraceptive methods can also lead to unhealthy outcomes for young women[4]. Providing reproductive health education to prevent unwanted pregnancies is crucial for improving the health and rights of women[6,7].

Despite government and private sector efforts, Uganda struggled with a severe HIV/AIDS epidemic worsened by economic decline, national security challenges, and warfare-induced destruction to communication and healthcare systems. High infection rates among skilled workers and educated youth hindered economic development, with the majority of cases occurring in individuals aged sixteen to forty. To address this, aggressive nationwide school education programs, blood screening, and public awareness campaigns were launched. These efforts included broadcasting warnings through various media channels[8].

Various political and social organizations have implemented numerous initiatives with the goal of addressing the reproductive health necessities of young individuals and diminishing rates of teenage pregnancies[6,7]. Globally, despite the abundance and variety of programs aimed at preventing adolescent pregnancy, reproductive health education continues to be a fundamental element within these initiatives. Countless curricula focused on reproductive health and sexual education have been created and put into practice within schools, clinics, and communities, targeting youth groups[6,7,9].

Other studies have indicated that mediating factors play a crucial role in adolescents' sexual decisions and risky behaviors. These factors include increased knowledge related to sexuality, pregnancy, sexually transmitted infections (STIs), preventive measures, as well as one's perception of risk and individual attitudes towards risky behaviors, and self-efficacy in declining sexual intercourse and utilizing contraceptive methods[9-11]. These studies have also demonstrated that intermediary factors like knowledge and attitudes can influence adolescents' self-efficancy in making sexual decisions.

A well-conducted study evaluated the effectiveness of the "World Starts With Me (WSWM)" program, a comprehensive sexuality education program. By comparing the intervention and comparison groups, significant variations were observed in knowledge, attitudes, self-efficacy, and intentions regarding condom use and addressing coercive sex during the post-test. Participants in the WSWM program exhibited positive effects on self-efficacy and attitudes towards condom usage, as well as self-efficacy in preventing sexual assault[10]. Psychological theories emphasize the significance of knowledge, attitudes, and skills in influencing behavior, suggesting that modifications in these areas can lead to changes in health behaviors[12].

Limited research has explored the association between knowledge, behavior, and self-efficacy regarding health with a focus on specific regions in Uganda. Therefore, such studies can serve as

valuable reference materials for developing tailored adolescent education programs that address the specific needs of individual areas. A study conducted in the Luwero district of Uganda aimed to examine the association between reproductive health knowledge, attitudes, and self-efficacy among young women, and derive implications for developing a suitable reproductive health education program tailored to the rural area of Uganda.

2. Methods

2.1 Study Setting

The research took place in Luwero District, situated in the central region of Uganda. According to the National Population and Housing Census (NPHC), Uganda's population was 34.6 million in 2014, with a sex ratio of 94.5%, indicating 17.1 million males and 17.6 million females[1]. The district's population was approximately 476,900 in 2016, which increased to 523,600 by 2020[1, 13]. According to the health report from Luwero District, a total of 16,163 girls who were under the age of 19 experienced pregnancies in the 2020/21 fiscal year. Out of these young women, 442 were below the age of 15[14]. During the 1980s, the region was plagued by multiple wars and conflicts. This period was marked by severe violence, including armed combat, atrocities against civilians, and widespread human rights abuses. Females, in particular, faced heightened vulnerability to various forms of violence and exploitation. Women and girls were exposed to significant risks, including sexual violence such as rape and other gender-based abuses[8]. The district's literacy rate was reported as 82.7%, access to clean water stood at 69.0%, and access to electricity was recorded at 26.8%[15].

2.2. Study population and data collection

Data were collected from May to July 2016 in Luwero District, Uganda, using a cross-sectional survey. One of our researchers, who received training and supervision, carried out and oversaw the surveys[16]. The study population consisted of young women aged between 14 and 26 years. A self-reported, anonymized survey questionnaire was distributed in schools and health centers, and participants were recruited from both places. The secondary and primary schools were selected randomly. Teachers helped distribute the self-report survey questionnaires to female students in schools. Health facilities providing reproductive health services and relatively representative youth-friendly health services in the region were selected. In health facilities, participants were either clients or family members of clients waiting to be seen by a healthcare provider. The study's objective was clarified to prospective participants, who were then granted permission to proceed. The researcher explained the purpose of the interview and asked each informant for consent. Interviews were recorded using a digital device, with participants being informed that recordings would be kept confidential. Survey participants independently read and completed the informed consent form and survey. A total of 82 young women successfully filled out the self-report survey.

2.3. Validity and reliability of instrument

To construct the survey questionnaire, we initially gathered a wide range of items from existing questionnaires and measures used in journal articles. These instruments have been previously validated and demonstrated reliability[10,17-19]. To begin with, we included items from the questionnaire used in the WSWM program, which is an extensive sexual

education initiative implemented in Uganda. These inquiries address various aspects such as understanding, attitudes, intentions, and confidence in relation to sexual development, pregnancy, sexually transmitted infections (STIs), and the use of condoms[10]. Additionally, we incorporated the 'Mathtech Questionnaires: sexuality questionnaires for adolescents' into our approach. This standardized tool fulfills two objectives: evaluating essential knowledge domains, attitudes, and abilities that contribute to the prevention of adolescent pregnancy, and gauging significant outcomes related to reproductive health and sexuality education[17]. Thirdly, we utilized the 'SATZ adolescent health survey', which has been validated and proven reliable in measuring the outcomes of HIV/AIDS education programs in South Africa and Tanzania[18]. Lastly, we included the 'HOT questionnaire', which covers questions regarding demographic attributes, knowledge, attitudes and beliefs about HIV/AIDS/STIs, sexual behaviors, and substance use[19].

We excluded items that were less relevant or redundant, resulting in the selection of 24 questions that formed a concise scale aligned with the specific indicators. Some of the questions were appropriately reframed. The Cronbach's alpha coefficient values for knowledge, attitude, and self-efficacy items were 0.849, 0.751, and 0.691, respectively. The overall scale had a high Cronbach's alpha coefficient (0.870).

Data were collected from each participant using a self-report questionnaire consisting of seven sections; 1) questions related to sociodemographic characteristics of the participants. 2) questions related to knowledge of staying healthy during puberty. 3) questions related to knowledge of preventing unwanted pregnancy and STIs/HIV. 4) questions related to attitude toward contraceptive methods. 5) questions related to attitude toward women's roles and values. 6) questions related to attitude toward getting reproductive health support. 7) questions related to self-efficacy to participate in healthy activities.

The knowledge aspect focused on understanding sexual development, pregnancy, menstruation, sexually transmitted infections (STIs), and contraceptive methods. The questionnaire assessing knowledge of staying healthy during puberty consisted of six items, including 'I am knowledgeable about menstruation,' 'I understand the changes that occur during puberty,' and 'I know various ways to maintain good health and well-being.'

The questionnaire assessing knowledge of preventing unwanted pregnancy and STIs/HIV consisted of eight items, including 'I know about maintaining healthy relationships with boys' 'I am knowledgeable about preventing STIs, including HIV', 'I know how to prevent unwanted pregnancy', and so on.

Each item in the knowledge section, which comprised a total of 14 items, was rated on a five-point Likert scale spanning from 1 to 5. Higher scores indicated better knowledge. The final score for each knowledge category was obtained by summing the points from the respective questions. To determine the overall knowledge level, the total knowledge score was computed by adding up the scores obtained from the questionnaires assessing knowledge about maintaining health during puberty and knowledge about preventing unwanted pregnancy and sexually transmitted infections (STIs) or HIV.

The section on attitudes examined participants' perspectives women's roles and values, sexual education, the utilization of contraceptives, teenage pregnancy, and the level of confidence in healthcare providers.

The questionnaire assessing attitude toward

contraceptive methods consisted of three items, including 'If two individuals are not prepared for parenthood, they should use some form of birth control during sexual activity', 'If I engage in sexual activity without contraception (family planning), I am likely to become pregnant', and ' If I become pregnant now, it is a lot harder to live my dreams.'

The questionnaire related to attitudes towards women's roles and values consisted of two items, including 'Women play a significant role in society' and 'I consider myself important as a woman.'

The questionnaire assessing attitudes towards getting reproductive health support included two questions such as 'If I need to discuss matters concerning reproductive health with a healthcare professional, I trust that the information will be kept confidential' and 'I believe that sex education is important for students in Uganda.' In total, the attitude dimension encompassed seven items, and participants rated their responses on a five-point Likert scale ranging. The overall attitude score was calculated by summing the points from the individual questions within each attitude scale, and separate scores were obtained for each specific attitude scale.

The self-efficacy assessment evaluated the participants' self-efficacy in using or obtaining sanitary products, their aspirations to become future leaders and positive role models, their involvement in activities that promote healthy living, and their access to reliable reproductive health information and services in their communities. The questionnaire assessing self-efficacy to participate in healthy activities consisted of four items, such as 'I can use/make sanitary products (pads) correctly', 'I can be a good leader and a good role model in the future', 'I can participate in activities that make me feel good and stay healthy (yoga, exercises, songs and dances)', 'If I need reproductive health information, I am able to obtain the information in my community'. Respondents rated each of these four items on a five-point Likert scale. In this scale, increased scores indicated greater levels of self-efficacy.

2.4. Statistical analysis

After the collection of data was finished, responses that contained incomplete information were excluded from the dataset. After completing the process of data cleaning, the gathered data was subjected to analysis using IBM SPSS Statistics for Windows version 23.0[20]. To showcase the characteristics of the study population, descriptive statistics such as frequencies, percent distribution, means, and standard deviation were employed. To identify any statistical differences between the means of different groups, t-tests and ANOVA were employed for bivariate analysis. Linear regression was performed, with self-efficacy scores as dependent variables and attitude and knowledge scores as independent variables. Statistical significance was determined by considering p-values below 0.05.

3. Results

3.1. Sociodemographic result

Eighty-two young women completed the survey. The socio-demographic characteristic of data indicated that among the participants surveyed, 48.8% were aged 16 to 17 years, and 20.7% were agreed under 15 years (Table 1).

Table 1. Characteristic of the respondents (N=82)

Characteristic	Categories	N	%
Age-group	〈15	17	20.7
	16-17	40	48.8
	18-19	15	18.3
	〉20	10	12.2

3.2. Results of each scale

Of the 82 respondents, 25 (30.5%) knew a lot about menstruation, 34 (41.5%) knew a lot about the changes that happen during puberty, 32 (39.0%) knew a lot about maintaining emotional and physical health, 28 (34.1%) knew a lot about where to seek help when abused or raped, 35 (42.7%) knew a lot about eating healthy foods for proper nutrition, 21 (25.6%) knew a lot about how to prevent unwanted pregnancy, and 23 (28.0%) knew some about preventing STIs, including HIV. Whereas 19 (23.2%) respondents answered that they knew nothing about where to get help if they were in an unhealthy relationship and could not get out, and 33 (40.2%) knew nothing about maintaining healthy relationships with boys. Many respondents answered that they knew nothing about family planning methods such as injection, implant, intrauterine device(IUD), pill (43.9%, 74.4%, 73.2%, 41.5%, respectively), and 23 (28.0%) knew very little about a condom (Table 2).

The responses regarding attitudes toward delaying initiation of sex, showed that 32 (39.0%) of 82 respondents strongly agreed to use contraceptive methods if they are not ready for a child, 32 (39.0%) strongly agreed that having sex without contraception can make pregnant, and 33 (40.2%) strongly agreed that they are pregnant now can be a barrier to live their dreams. In response of attitudes toward women's role and value, 59 respondents answered that they strongly agreed that women have an important role in the world, and 54 (65.9%) strongly agreed they were very important as a woman. Regarding the questions about attitude toward getting reproductive health support, 29 (35.4%) strongly agreed to trust healthcare workers regarding reproductive health issues, and 38 (46.3%) strongly agreed that sex education for students in Uganda is important(Table 3).

Table 2. Knowledge survey results **(N=82)**

Questions about knowledge	I know nothing (%)	I know very little (%)	I know some (%)	I know a good amount (%)	I know a lot (%)	Mean±SD
Knowledge of staying healthy during puberty						
Menstrual knowledge	11.0	9.8	30.5	18.3	30.5	3.5 ± 1.3
Knowledge pertains to the transformations that occur during puberty	11.0	8.5	14.6	24.4	41.5	3.8 ± 1.4
Knowledge of multiple methods to promote personal well-being and maintain good health	7.3	11.0	24.4	18.3	39.0	3.7 ± 1.3
Knowledge of the resources and procedures for seeking assistance in cases of abuse or rape	17.1	7.3	17.1	24.4	34.1	3.5 ± 1.5
knowledge of resources for help in unhealthy relationships and inability to leave	23.2	12.2	22.0	20.7	22.0	3.1 ± 1.5
Knowledge of healthy food for proper nutrition	12.2	8.5	12.2	24.4	42.7	3.8 ± 1.4
Knowledge of preventing unwanted pregnancy and STIs/HIV						
Knowledge of maintaining healthy relationships with boys	40.2	18.3	17.1	12.2	12.2	2.4 ± 1.4
Knowledge of STI and HIV prevention	24.4	8.5	28.0	12.2	26.8	3.1 ± 1.5
Knowledge of unwanted pregnancy prevention	24.4	20.7	18.3	11.0	25.6	2.9 ± 1.5
Knowledge of the injection as a family planning method	43.9	30.5	9.8	7.3	8.5	2.1 ± 1.3
Knowledge of the implant as a family planning method	74.4	12.2	4.9	6.1	2.4	1.5 ± 1.0
Knowledge of the intrauterine device as a family planning method	73.2	4.9	11.0	7.3	3.7	1.6 ± 1.2
Knowledge of the condom as a family planning method	14.6	28.0	14.6	17.1	25.6	3.1 ± 1.4
Knowledge of the pill as a family planning method	41.5	12.2	23.2	11.0	12.2	2.4 ± 1.4

Table 3. Attitude survey results (N=82)

Questions about attitudes	Strongly Disagree (%)	Disagree (%)	Neither (%)	Agree (%)	Strongly Agree (%)	Mean±SD
Attitude toward contraceptive methods						
The importance of birth control for individuals not ready for parenthood	12.2	7.3	9.8	31.7	39.0	3.8 ± 1.4
The consequences of unprotected sex: potential pregnancy without contraception	9.8	11.0	11.0	29.3	39.0	3.8 ± 1.3
The impact of early pregnancy on the pursuit of personal aspirations	15.9	8.5	3.7	31.7	40.2	3.7 ± 1.5
Attitude toward women's role and value						
The significance of women's role in society	4.9	2.4	0	20.7	72.0	4.5 ± 1.0
Recognizing the importance of women's contribution	13.4	4.9	2.4	13.4	65.9	4.1 ± 1.4
Attitude toward getting reproductive health support						
Ensuring confidentiality in reproductive health discussions with healthcare professionals	13.4	13.4	4.9	32.9	35.4	3.6 ± 1.4
The importance of sex education for students in Uganda	23.2	13.4	2.4	14.6	46.3	3.5 ± 1.7

Table 4. Self-Efficacy survey results (N=82)

Questions about self-efficacy	Strongly Disagree (%)	Disagree (%)	Neither (%)	Agree (%)	Strongly Agree (%)	Mean±SD
Self-efficacy to participate in healthy activities						
Correct usage of sanitary products (pads)	12.2	4.9	2.4	30.5	50.0	4.0 ± 1.4
Future potential as a leader and role model	9.8	3.7	1.2	28.0	57.3	4.2 ± 1.3
Engagement in wellness-promoting activities (yoga, exercises, songs, and dances)	8.5	2.4	9.8	34.1	45.1	4.0 ± 1.2
Access to community-based reproductive health information	13.4	9.8	7.3	46.3	23.2	3.6 ± 1.3

Table 5. Description of the generated scores

	Knowledge of staying healthy during puberty score	Knowledge of preventing unwanted pregnancy and STIs/HIV score	Attitude toward contraceptive methods score	Attitude toward women's role and value score	Attitude toward getting reproductive health support score	Self-efficacy to participate in healthy activities score
Mean	21.3	19.1	11.3	8.7	7.1	15.8
Median	22.0	18.0	12.0	10.0	7.5	17.0
SD	5.9	6.9	3.0	2.1	2.5	3.7
Variance	34.9	47.2	9.1	4.4	6.1	13.7
Minimum	6.0	8.0	3.0	2.0	2.0	4.0
Maximum	30.0	36.0	15.0	10.0	10.0	20.0

The findings of the self-efficacy to participate in healthy activities, as reported by the participants, showed that 41 (50.0%) respondents strongly agreed that they could use or make sanitary products correctly. Additionally, 47 (57.3%) respondents strongly agreed that they could be good leaders and role models in the future. Moreover, 37 (45.1%) respondents strongly agreed that they could participate in activities that make them feel good and stay healthy, while 38 (46.3%) respondents agreed that they can obtain reproductive health information in the community when needed (Table 4).

3.3. Score calculations and correlation

The mean scores for each scale were as follows; knowledge of staying healthy during puberty (21.3±5.9), knowledge of preventing unwanted pregnancy and STIs/HIV (18.0±6.9), attitude toward contraceptive methods (12.0±3.0), attitude toward women's role and

value (10.0±2.1), attitude toward getting reproductive health support (7.5±2.5), and self-efficacy to participate in healthy activities (17.0±3.7) (Table 5).

Knowledge of staying healthy during puberty was significantly associated with knowledge of preventing unwanted pregnancy and STIs/HIV(r=0.519), attitude toward contraceptive methods (r=0.296), attitude toward women's role and value (r=0.420), Attitude toward getting reproductive health support (r=0.361), and self-efficacy to participate in healthy activities (r=0.609). Knowledge of preventing unwanted pregnancy and STIs/HIV was significantly associated with attitude toward women's role and value (r=0.258) and self-efficacy to participate in healthy activities. (r=0.318). Attitude toward contraceptive methods was significantly associated with attitude toward women's role and value (r=0.536), attitude toward getting reproductive health support (r=0.504), and self-efficacy to participate in healthy activities (r=0.517). Attitude toward women's role and value was significantly associated with attitude toward getting reproductive health support (r=0.459). Attitude toward getting reproductive health support was significantly associated with self-efficacy to participate in healthy activities (r=0.559) (Table 6).

3.4. Bivariate analysis of factors associated with scores

The findings indicate that a higher average score for attitude toward contraceptive methods was correlated with the age range of 18 to 19 years. Similarly, a higher mean attitude score toward obtaining reproductive health support was associated with the age range of 16 to 17 years. Moreover, a higher mean score for self-efficacy to engage in healthy activities was linked to the age range of 16 to 17 years (Table 7).

Table 6. Pearson's correlation between each score

	Knowledge of staying healthy during puberty	Knowledge of preventing unwanted pregnancy and STIs/HIV	Attitude toward contraceptive methods	Attitude toward women's role and value	Attitude toward getting reproductive health support	Self-efficacy to participate in healthy activities
Knowledge of staying healthy during puberty	1.00					
Knowledge of preventing unwanted pregnancy and STIs/HIV	0.519***	1.00				
Attitude toward contraceptive methods	0.296**	0.16	1.00			
Attitude toward women's role and value	0.420***	0.258*	0.536***	1.00		
Attitude toward getting reproductive health support	0.361***	0.05	0.504***	0.459***	1.00	
Self-efficacy to participate in healthy activities	0.609***	0.318**	0.517***	0.649***	0.559***	1.00

*p < 0.05, **p < 0.01, ***p < 0.001.

Table 7. Bivariate analyses of factors associated with scores

	Knowledge of staying healthy during puberty	Knowledge of preventing unwanted pregnancy and STIs/HIV	Attitude toward contraceptive methods	Attitude toward women's role and value	Attitude toward getting reproductive health support	Self-efficacy to participate in healthy activities
Age-group						
<15	20.4 ± 8.5	18.5 ± 5.8	8.5 ± 3.6	7.5 ± 3.0	4.6 ± 2.2	12.8 ± 5.0
16-17	21.7 ± 4.8	18.6 ± 6.8	11.6 ± 2.4	9.0 ± 1.7	8.2 ± 1.8	17.0 ± 2.8
18-19	21.5 ± 5.5	19.1 ± 5.5	12.7 ± 2.1	9.0 ± 1.6	7.7 ± 2.0	16.0 ± 2.7
>20	20.7 ± 5.8	22.2 ± 10.2	12.4 ± 2.8	8.9 ± 1.7	6.2 ± 2.7	16.0 ± 3.2
P-value	0.873	0.499	<0.001	0.071	<0.001	<0.001

ANOVA test was used to compare between three or more groups. Bold values represent the largest proportion in the corresponding part.

Table 8. Multivariable analyses: multiple linear regression

	Unstandardized beta	Standardized beta	P-value	95% confidence interval for B	
				Lower limit	Upper limit
Model 1 taking the self-efficacy to participate in healthy activities score as the dependent variable					
Knowledge	0.112	0.339	<0.001	0.060	0.165
Attitude	0.307	0.515	<0.001	0.195	0.418
Model R^2			0.596		
Model 2 taking the self-efficacy to participate in healthy activities score as the dependent variable					
Knowledge of staying healthy during puberty	0.236	0.376	<0.001	0.119	0.352
Knowledge of preventing unwanted pregnancy and STIs/HIV	0.008	0.014	0.867	-0.084	0.099
Attitude toward contraceptive methods	0.114	0.093	0.331	-0.119	0.347
Attitude toward women's role and value	0.583	0.330	<0.001	0.267	0.898
Attitude toward getting reproductive health support	0.176	0.118	0.241	-0.121	0.474
Model R^2			0.650		

3.5. Multivariable linear regressions

Multivariable linear regression took self-efficacy to participate in healthy activities scale score as the dependent variable. Sociodemographic characteristics were used as control variables. Model 1, taking the self-efficacy to participate in healthy activities score as the dependent variable, suggested that total knowledge score (β=0.339, p<0.001) and total attitude score (β=0.515, p<0.001) were significantly associated with self-efficacy score. The results showed that these variables accounted for 59.6% of the variance in self-efficacy to participate in healthy activities. Model 2 indicated that the higher knowledge of staying healthy during puberty (β=0.376, p<0.001) and attitude toward women's role and value (β=0.330, p<0.001) were significant predictors of self-efficacy to participate in healthy activities (Table 8).

4. Discussion

The study revealed that young women with extensive knowledge about maintaining good health during puberty and a positive attitude towards women's roles and value exhibited higher self-efficacy in engaging in healthy activities. The findings are consistent with previous studies that factors such as knowledge of sexual issues, pregnancy, STIs, and prevention methods, personal attitudes toward risky sexual behaviors, pregnancy, and protection, as well as self-efficacy in refusing sexual activity and using contraception[9-11].

Inadequate information and education regarding sexual and reproductive health were identified as prominent factors that contribute to risky sexual behavior and teenage pregnancy[21]. Our findings propose that educational approaches can effectively raise awareness and improve skills, empowering girls to understand their rights as women and make independent decisions[22].

The primary goal of reproductive health education programs is to decrease the adverse consequences of sexual behavior and minimize teenage pregnancies. Kirby and colleagues undertook a comprehensive review of 83 evaluations of sexual education programs across different countries, encompassing both developed and developing nations[9]. The analysis primarily concentrated on assessing the effects of these programs on sexual risk behaviors and associated factors. Among the studies reviewed, 18 specifically focused on

developing countries in East Africa. These programs were specifically designed for adolescents aged 9 to 24 from low to middle-income households.

The results demonstrated increased knowledge about sexually transmitted infections (STIs) and pregnancy (in the majority of programs), improved values and attitudes (over 60% of programs), enhanced understanding of peer sexual conduct and societal norms (over 40% of programs), increased self-confidence in preventing unwanted sexual encounters (over 50% of programs), and more consistent condom use (over 60% of programs)[9]. Furthermore, previous investigations into sexual health education carried out in Kenya and Nigeria showed changes in adolescents' sexual health behaviors, including deferred onset of sexual activity, reduced frequency of sexual encounters, and/or heightened condom usage[23,24].

The groups considered in the review exhibit resemblances to the demographic of young women in Uganda who are the focus of this study. Additionally, the findings from the prior studies indicated similarities across countries and various settings, such as schools, clinics, and communities[9]. Therefore, the findings and outcomes of the review can be relevant to result of this study, which deal with similar sexual behavior concerns. According to the reviews, many sexual education programs can improve mediating factors. Relevant perceived norms, knowledge, attitudes, and self-efficacy are the factors specified in the theory of planned behavior as determining behavior. Furthermore, these factors have been demonstrated empirically to be related to their respective sexual behaviors[9].

Consistent with previous studies, in our study we also found that knowledge and attitude had a significant association with self-efficacy regarding reproductive health. To be specific we found a better knowledge of how to stay healthy and a more positive attitude toward women's roles and values are critical factors contributing to changes in self-efficacy of health behaviors. Based on our findings, we emphasize that when people develop reproductive health education programs, they need to consider how to increase their knowledge of staying healthy during puberty. The education program for adolescents needs to include information on how to manage menstruation, body changes, and healthy relationship with others. Moreover, not only improves knowledge of women, but it is also important to remind females how they are important as women. By placing emphasis on the roles and values of women, it will actively contribute to the empowerment of teenagers in Uganda, ensuring the consistent establishment of a safe social environment.

Developing effective interventions to prevent adolescent pregnancy requires incorporating best practices and insights from various studies[25-28]. Additionally, these interventions should be grounded in sound psychological theories that emphasize the role of internal cognitive factors in determining behavior[12]. Various psychological theories offer a conceptual structure to comprehend how interventions can affect cognitive factors and ultimately influence behavior[12].

To effectively address early pregnancy, it is necessary to develop programs that clearly define curriculum goals, long-term behavior outcomes, mediating factors, and corresponding activities[6,7,12,29]. It is crucial for these programs to prioritize addressing influential factors that promote delaying sexual initiation and reducing risky sexual behaviors. These factors include enhancing knowledge regarding

sexual matters, HIV, other sexually transmitted infections (STIs), and pregnancy. In addition, emphasis should be placed on shaping personal values and attitudes towards sex, contraceptive methods, pregnancy, and building skills and self-confidence to refuse unwanted sexual encounters and avoid engaging in risky behavior[9,11]. Evidence from studies conducted in Uganda and other developing countries highlights the effectiveness of comprehensive reproductive health education programs [10,23,24].

According to Meyer-Weitz et al., a study conducted in South Africa suggests that educational strategies aiming to promote healthy sexual behaviors should include components such as culturally sensitive provision of appropriate and accurate information, as well as the development of knowledge and skills[30]. The findings of the study emphasize the importance of educational programs that promote a deeper socio-cultural comprehension of sexual matters within the framework of gender dynamics[30]. The curriculum should be specifically tailored to address the complex factors contributing to risky sexual behaviors and adolescent pregnancy, including factors such as economic deprivation, disparities in gender roles and opportunities, instances of violence, early marriage of minors, and restricted availability of healthcare services for Uganda[22,31,32].

Many scholars suggest that schools can serve as ideal sites to deliver reproductive health education, providing a safe environment and addressing gender-based violence[33,34]. Peer education within schools can also be beneficial as young people are more likely to discuss sensitive topics like sexuality with their peers, fostering information sharing with perceived credibility[35]. Therefore, implementing the newly developed program within a school setting can enhance teenage participants' engagement and motivation.

However, it is crucial to ensure that youth friendly reproductive health programs are accessible to young people with limited formal education[36]. To achieve optimal social outcomes, reproductive health education should also extend beyond formal educational settings to reach adolescents in rural areas and disadvantaged households, as evidenced by the UDHS report[37]. Therefore, the education program must be adaptable to address the specific social settings in Uganda.

5. Conclusion

This study revealed interesting associations between individuals' self-efficacy in engaging in healthy activities, their knowledge of maintaining good health during puberty, and their attitudes towards women's roles and values. These findings suggest that reproductive health education programs should target these specific factors. Numerous previous research studies have demonstrated the effectiveness of comprehensive sexuality education programs in diverse countries and among various youth populations. While certain behaviors may undergo swift transformations following the intervention, additional alterations in sexual behaviors and outcomes may not be immediately or directly observable. Therefore, While the provision of reproductive health education might not necessarily provide a flawless solution, it can effectively prevent undesired teenage pregnancies and promote healthy behaviors. The newly developed program should adequately deal with the high-risk issues in Uganda by incorporating practical components, well-founded psychological theories and mechanisms, and

considering the specific cultural context. To effectively address adolescent pregnancy and related reproductive health issues in Uganda, future education programs should focus on enhancing knowledge about maintaining good health during adolescence and fostering positive attitudes toward women's values and roles.

This study had certain limitations that must be taken into consideration. First, the sample size needed to be bigger to be representative of the region. Therefore, it is essential to exercise caution while interpreting the outcomes. The reliability and representativeness of the findings could have been enhanced had a larger sample been involved in the survey. Second, we could not collect some sociodemographic information, such as educational level and residence, from some participants due to technical limitations. During the data-cleaning process, we eliminated these data and could only use limited data. So, we could not control some sociodemographic factors in regression analysis. Third, due to the nature of the study, this cross-sectional study may have limits in demonstrating a causal relationship between variables. Lastly, as the data were based on a self-report survey, the data may be subjected to participants' recall bias.

Despite these limitations, the primary strength of this study is its investigation of women in a specific region as an important case for understanding the association between mediating factors, including knowledge, attitudes, and self-efficacy, which play a crucial role in women's decision-making regarding healthy behaviors. As a result, the findings can have implications for the development of future strategies in reproductive health education programs for similar situations.

Conflict of interest: The authors declares that there is no conflict of interest

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