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Evaluation of a Right-based Intervention in Enhancing Knowledge of Life Skills and Pubertal Social Changes among Primary School Children: A Randomized Control Study in Jinja, Uganda

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Abstract

Adolescence programs designed to improve access to sexuality information and other services mainly focus on the rights of children in secondary schools leaving behind those aged 15 years and below. This study aimed at evaluating the effectiveness of a school-based curriculum intervention designed to enhance knowledge of survival skills, personal hygiene, and pubertal social changes among the 10-14-year-old boys and girls in primary schools in Uganda. We conducted a Randomized Controlled Study. In phase one, we used a self-administered questionnaire to collect baseline data from 10-14-year-old boys and girls in 16 primary schools. Baseline data was analyzed to identify life skills, personal hygiene and social changes knowledge gaps. We designed and pre-tested a curriculum intervention to address the identified knowledge gaps and randomly selected eight intervention and eight comparison schools. We trained two teachers from each intervention schools who implemented the intervention for six weeks. We used the same questionnaire administered at baseline to collect endline data from children in the 16 schools who had taken part in the baseline. Paired t-test and one-way ANOVA were used to compare the mean scores between the intervention and comparison groups at baseline and endline to determine the Net Intervention Effect (NIE). There was overall increase in knowledge of survival skills, personal hygiene and social changes from baseline to endline in the intervention schools. On average, boys aged 13 and 14 years in the intervention schools made a significant improvement in knowledge on survival life skills ($t=2.945$; $p<.05$) and ($t=3.721$; $p<.05$) with a NIE of 3.79 and 6.29 respectively. Boys whose both parents were alive showed an increase in knowledge on personal hygiene skills ($t=1.856$; $p<.05$) with NIE of 0.37. Boys in the intervention schools whose both parents were dead made a significant improvement in knowledge of social changes ($t=2.844$; $p<.05$) with a NIE of 0.71. There was improvement in knowledge and the intervention was most effective among children aged 12 and 14 years most especially those from Anglican and non-religious affiliated schools and parents' occupation had the biggest impact on knowledge improvement on social changes.

Key Words: Effectiveness, Right-based Intervention, Survival skills, Personal Hygiene skills, Pubertal Social Changes, Primary School Children, Jinja, Uganda

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1. Introduction

1.1. Background

Research on adolescence and programs designed to improve access to sexuality information and other services mainly focus on the rights of children aged 15-19 years in secondary schools (Mutea et al., 2019), which means that needs and concerns of children under 15 years are neglected (WHO, 2010). This implies that there is a need for key stakeholders to pay attention to life skills (survival and personal hygiene) and pubertal social changes among boys and girls especially those aged 10-14 years in primary schools so as to enable them cope with the natural sexual feelings and practice personal hygiene (MoES, 2018). Life skills are defined as “a large group of psychosocial and interpersonal skills that can help people make informed decisions, communicate effectively, and develop coping and self-management skills that may help lead a healthy and productive life (Education for Change & UNICEF, 2012).

Worldwide, the knowledge of teenagers on the dynamics that take place within their body during puberty plays a pivotal role on how they cope with pubertal social changes which require life skills, personal hygiene etc (UNICEF, 2019). Life skills are the combination of knowledge and attitudes that constitute a set of competencies that enable youth to adapt and thrive in society (Dupuy, Bezu, Knudsen, & Halvorsen, 2018). The onset of puberty affects boys and girls differently, these effects change the way teenagers relate socially because their bodies, emotions and brains are significantly altered (Mendle, Beltz, Carter, & Dorn, 2019). For instance, the life skills that benefit adolescent girls and boys are largely the same but may be applied differently, and to different kinds of needs, challenges and risks in their lives (UNFPA, 2019). It should be noted that social interactions become increasingly complicated as children move into adolescence where they spend more time with peers and as they interact with peers of the opposite-sex (PAHO, 2001).

In Africa, donors and NGOs among others have enthusiastically embraced life skills to the extent of developing curricula for implementation in schools and communities (Tiendrebéogo, Meijer, & Engleberg, 2003). Besides the rights-based approach, some of the interventions that are seen as avenues to reduce teenage pregnancies in Africa include: availability and accessibility of quality education, keeping young mothers in school, and counselling and guiding students to make the right choices among others (WHO/UNFPA, 2013). However, of the emerging activities in support of life skills programs in sub-Saharan Africa, most interventions do not have integrated evaluation components, and still few programs have been evaluated (Tiendrebéogo et al., 2003). Accordingly, these interventions must be combined and integrated for effectiveness (WHO/UNFPA, 2013).

Reports indicate that majority of children residing in developing countries such Uganda have limited social survival skills (Nabugoomu, Seruwagi, & Hanning, 2020). Likewise, a study conducted among primary schools in Eastern Uganda also established that teachers do not have enough time and often lack life skills materials (Opio, 2010). This is

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probably why an “evaluation of a school-based comprehensive sexuality education program among very young adolescents in rural Uganda” found greater improvements in SRH knowledge among intervention schools but did not find significant differences in some pubertal social changes (Kemigisha et al., 2019). Instead, a better understanding life skills helps young people to make independent decisions and better cope with pressure from peers, family, community and media messages (UNESCO, 2014). Thus, it is time to build the capacity of the next generation of adults with the relevant knowledge and skills to enable them thrive as adults and overcome challenges in their environment (UNICEF, 2017).

1.2. Problem Statement

Enhancing life skills has become a popular approach for prevention and health promotion in schools because it empowers children to effectively deal with day-to-day life demands. Children need information and life skills in order to manage and appropriately respond to changes and challenges they face during puberty (Prajapati, 2017). While, research on adolescence and programs designed to improve access to sexuality information and other services mainly focus on the rights of children aged 15 years and above, there is still little systematic and comprehensive understanding of life skills and pubertal social changes among children especially those who are below 15 years (Mutea et al., 2019; Ninsiima, Chiumia, & Ndejjo, 2021). Besides, some school-related factors such as student–teacher relationships tend to influence social skills development (Sørli, Hagen, & Nordahl, 2021). However, there is little evidence available on the effectiveness of life skills development programs (Kirchhoff & Keller, 2021), Therefore, there is a need to evaluate these programs in an effort to enhance life skills education as it promotes health-related self-regulation especially among young adolescents in primary schools.

1.3. Aim of the Study

The study evaluated the effectiveness of a rights-based intervention to enhance knowledge of life survival skills, personal hygiene and social changes that occur at puberty among boys and girls aged 10 -14 years in primary schools in Jinja District, Uganda.

2. Methods

2.1 Study Sites and Context

The study was conducted in primary schools in Jinja District in Eastern Uganda. Jinja is named after its main City and commercial center and has an area of 723sq km. The majority of the people in Jinja District belong to the Basoga ethnic group and Lusoga and Luganda are the most widely spoken local languages. Jinja is divided into two administrative units, Jinja City (urban) and Jinja District (Rural) as seen in table 1. Jinja rural is composed of two counties; Kagoma and Butembe. Jinja City is the second largest in Uganda and a former industrial heart of East Africa. Primary education in Jinja is under two separate entities; Jinja District Education Office and Jinja City Education Office.

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Table 1: Number of Primary Schools in Jinja District

S/N	Municipality/ County	Government schools	Private schools	Total
1	Jinja city (Urban)	20	05	25
2	Butembe County (Rural)	29	21	60
3	Kagoma County (Rural)	58	06	64
	Total	107	32	149

Source: Primary data 2018

2.2. Study Design and Setting

We employed a Randomised Control Trial (RCT) to evaluate the effectiveness of a rights-based intervention to enhance knowledge of life survival skills, personal hygiene and pubertal social changes among children aged 10-14 olds in 16 primary schools in Jinja district. We purposively selected Six urban schools from Jinja Municipal and ten rural schools from Kagoma County as shown in table 2. Purposive selection was intended to cater for diversity of school characteristics such as; day/ boarding, private/ government, urban/ rural, religious affiliation, and whether they are single sex/mixed. Jinja was desired because the Uganda Police Crime report of 2013 ranked Jinja as the district with highest cases of child sexual abuse in the Busoga region (Uganda Police Force, 2013). Busoga region is known for early pregnancies, early marriages and school dropout (Nabugoomu et al., 2020).

Table 2: Showing the Types of Visited Schools.

S/N	Municipality/ County	Total
1	Jinja Municipal (Urban)	06
2	Kagoma County (Rural)	10
	Total	16

Source: Primary data 2018

This study followed the CONSORT guidelines for reporting of randomized controlled trials (Schulz, Altman, Moher, & The Consort Group, 2010). When appropriately designed, conducted, and reported, RCTs represent the gold standard in evaluating healthcare interventions (Schulz et al., 2010).

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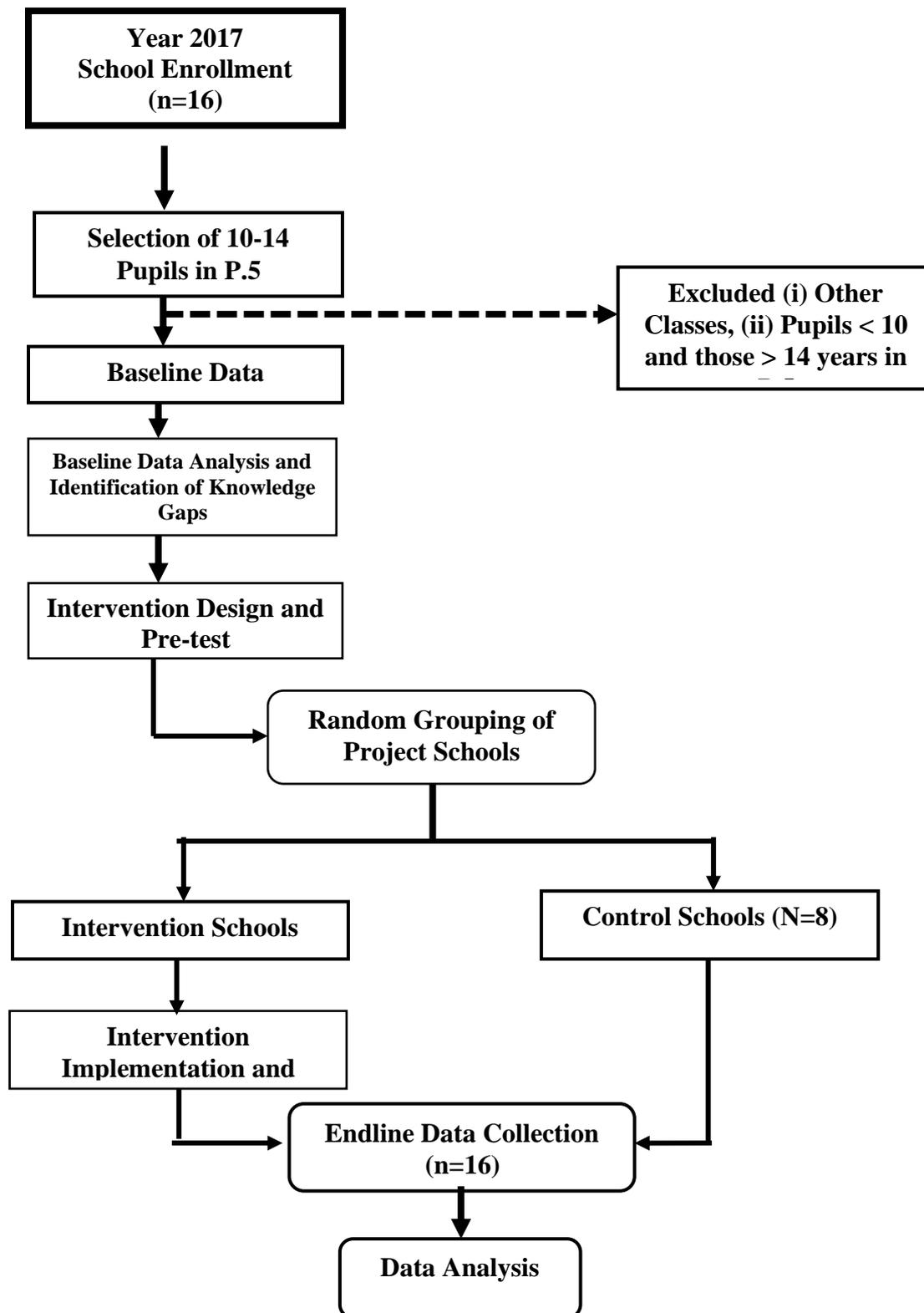


Fig. 1 Flow Chart Showing the Distribution of Participating Schools and Participants

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Source: Primary data collection design 2018

2.3. Characteristics of the Study Participants

The participants were 10-14-year-old boys and girls in Primary Five. This age group was selected because it is on average the age at which secondary sex characteristics begin to occur in both boys and girls; boys' voices deepen, grow facial and pubic hair, and this is when most girls start their menstruation periods, grow pubic hair and develop breasts (Search Institute, 2020). Also, the age of entry to primary school varies from child to child due to a number of factors but the official primary school enrollment age is 6 years (Kan & Klasen, 2021). It was therefore possible to get children aged 10-14 in primary five. It is important to note that some of the children were located in the rural and some in urban schools. Characteristics, exposure and provision of basic requirements of children in rural setting often differ from those of children located in urban settings (UNICEF, 2013).

2.4. Sample Size Calculation

The cluster randomized trial involved 8 intervention schools and 8 control schools. These were urban schools (n=6) and rural schools (n=10) which is representative of the local context. Sample size estimation was based on two-arm, parallel-group, completely randomized design (Rutterford et al., 2015). Considering the intra-class correlation of 0.01 calculated from the pilot test among 300 pupils and a design effect of 1.5, it was determined that a minimum sample size of 800 would be needed to measure a difference of 1.14 between groups with a power of 95% and a variance of 22.1. Therefore, for a comparison of means, in a two-arm trial with equal allocation the required number of individuals per group, m, is calculated as: -

$$m = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 (1 + (n-1)p)}{\Delta^2}$$

Where design effect is given by the formula: -

$$1 + (n-1)p$$

Where;

n is number of individuals per cluster and

p is the intra-class correlation collected

Z_x is the xth percentage point of the standard normal distribution,

Δ the clinically important difference in treatment means and

δ^2 the variance in the outcome.

$$\Delta^2 = 1.3, \delta^2 = 22.1, DE = 1.5, Z_{1-\alpha} = 1.96, Z_{1-\beta} = 0.84, n = 50$$

$$m = \frac{(1.96 + 0.84)^2 \times 22.1 \times 1.5}{1.3}$$

$$1.3$$

Therefore, the number needed in each arm was = 399.8 \approx 400

2.5. Data Collection and Intervention Procedures

Data for this study was collected in two phases, that is, during the baseline survey and during the endline survey. Prior to the baseline data collection, four research assistants; two males and two females were trained.

2.5.1. Baseline data collection: We used a self-administered questionnaire (SAQ) developed and pretested by the research team to collect the quantitative baseline data from the 16 selected primary schools. The questionnaire was designed to assess what children know about

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life skills, personal hygiene and pubertal social changes, among other things. Baseline data was analysed and knowledge gaps were identified to inform the intervention.

2.5.2. The intervention: The researcher designed and pre-tested a curriculum intervention in form of a teachers' manual aimed at addressing the identified knowledge gaps. The intervention was designed to guide the teachers in enhancing the 10-14-year-old boys and girls at primary school level with knowledge about life skills, personal hygiene and pubertal social changes as means of protection and empowerment against child abuse and exploitation. The intervention entailed clearly explained; topics, objectives, methods of teaching, content, illustrations, children's activities, teachers' activities and key messages

2.5.3. Randomized grouping of schools and training of teachers: The 16 project schools were randomly grouped as eight schools in the intervention arm and eight schools in the comparison arm. A total of 16 teachers; two from each of the eight intervention arm schools were purposively selected with the guidance of the school administration to implement the intervention. The 16 selected teachers were trained at a 2-day workshop. At the beginning of the training, teachers were asked what they knew about life skills, personal hygiene and pubertal social changes and child protection and their responses were written on a flipchart. The teachers were also asked for their expectations and fears during the training and implementation of the intervention. Thereafter, they were trained in the curriculum which entailed: - five sessions with content, time allocation, objectives, methods, materials needed, children's activities, teachers' activities and key messages spelt out for each session. At the end of the training, teachers were asked oral questions to ascertain whether their expectations mentioned at the beginning of the training had been met. They then drew an implementation action plan and shared the sessions among themselves.

2.5.4. Implementation of the intervention: After the training, the teachers in each intervention school taught the curriculum to the whole of the primary 5 children for six weeks, including those who were not selected to respond to the questionnaire. Timing of the six weeks was estimated basing on the number and length of the sessions to be taught. In the Uganda primary school education system, class time officially ends at 3:30 pm and children go for co-curricular activities. To avoid interfering with the official class time, the intervention was taught on every school day from 3:30pm-4:30pm.

2.5.5. Monitoring and Evaluation of the intervention implementation: This was done by the research team and officials from Makerere University Directorate of Research and graduate training (DRGT).

2.5.6. Endline data collection: After teaching of the intervention, Endline data was collected from all the 16 selected schools, i.e., the eight intervention and eight comparison schools. The same questionnaire that was administered at baseline data collection was administered to the same children who took part at endline phase.

2.6. Outcome Variable

These were the difference in difference in knowledge scores in Life survival skills, personal hygiene and social changes at baseline and at endline. We calculated a total knowledge score

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on each of the outcome variables by summing responses to all items. Each item was a statement about a particular topic and children were asked if they thought the statement was “Not true”, or “Certainly true” In the analysis, a higher score implied acceptable levels of knowledge. The details of the maximum scores for each domain are summarized in table 3.

Table 3: Showing Maximum Knowledge Scores at Baseline and Endline

Outcome variable	Items used	Coding
Survival Skills	23	Coded 1 if answer is correct and 0 if otherwise
Personal Hygiene Skills	9	Coded 1 if answer is correct and 0 if otherwise
Social Changes	8	Coded 1 if answer is correct and 0 if otherwise

Source: Primary data 2018

2.7. Data Analysis

Data were double-entered into EpiData 3.0 and analysed using Stata v14.0 for the calculation of frequencies as percentages, and averages as means and standard deviations (SDs). Paired t-test and one-way ANOVA were used to compare average scores between groups. Baseline data was analysed and an intervention was designed, pre-tested and implemented in eight intervention schools. Endline data was collected from 16 schools (eight in intervention and eight in comparison); and was compared with baseline data to establish net intervention effect (NIE). Thus, intervention effect was estimated as the difference between intervention and control groups regarding changes in means from baseline to end line. P-values from a t-test and 95% confidence intervals for the intervention effect were calculated based on a normal distribution assumption. P-value of 0.05 was considered a statistically significant result.

2.8. Ethical Considerations

Ethical considerations were approved by the Higher Degree Research Ethics Committee (HDREC) of Makerere University School of Public Health (MUSPH). Consent and assent were sought from all head teachers and children that participated in our study respectively. The study was conducted in accordance with the four basic research ethics principles namely; respect for persons, beneficence (limited harm, sound design and competent investigators), No evil, and morally right, and distributive (UNCST, 2007).

3.0 Results

3.1. Children’s Knowledge of Survival Life Skills.

Table 4 describes mean scores of children’s knowledge of survival skills according to their socio-demographic characteristics. Findings indicate mean scores in knowledge on survival skills based on assessments done in both the intervention and control primary schools at baseline and endline. On average, boys aged 13 and 14 years in the intervention and control schools at baseline and endline by their socio-demographic characteristics (Maximum Score $c = 23$) had significant variations. Those in intervention schools made a significant improvement in knowledge of survival life skills ($t = 2.945$; $p < .05$) and ($t = 3.721$; $p < .05$) with a NIE of 3.79 and 6.29 respectively. However, boys aged 11 years made a significant

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decrease in knowledge on survival life skills with a NIE of -3.75. Girls aged 12 years and 14 years in the intervention schools made a significant increase in knowledge on survival life skills ($t = 1.679$; $p < .05$) and ($t = 1.995$; $p < .05$) with a NIE of 2.20 and 3.77 respectively.

On average, boys in the intervention schools whose mothers and fathers were peasants made a significant improvement in knowledge on survival life skills ($t = 4.874$; $p < .05$) and ($t = 2.260$; $p < .05$) with a NIE of 4.75 and 2.58 respectively. On the contrary, boys in the intervention schools whose mothers were teachers and medical workers made a significant decrease in knowledge on survival life skills and this resulted into a NIE of -6.02 and -4.08 respectively. Similarly, girls in the intervention schools whose mothers were medical workers and business women made a significant decrease in knowledge on survival life skills with a NIE of -3.50 and -2.05 respectively.

Boys and girls whose both parents were dead showed significant increase in knowledge on survival life skills ($t=3.042$; $p < .05$) and ($t=1.908$; $p < .05$) with a NIE of 4.41 and 2.77 respectively. Relatedly, boys whose mothers were alive and were in the intervention schools had a significant increase in knowledge on survival life skills ($t=1.867$; $p < .05$) with a NIE of 1.21. Conversely, girls whose mothers were dead and were in the intervention schools had a significant decrease in knowledge on survival life skills with a NIE of -4.25. However, boys and girls with no fathers and were in the intervention schools had a significant increase in knowledge on survival life skills ($t = 2.194$; $p < .05$) and ($t=1.689$; $p < .05$) with a NIE of 3.62 and 2.68 respectively.

On average, boys in the intervention schools whose parents were not married to each other made a significant improvement in knowledge on survival life skills ($t = 3.063$; $p < .05$) with a NIE of 3.67. On the other hand, boys in the urban based intervention schools made a significant improvement in knowledge on survival life skills ($t = 2.932$; $p < .05$) with a NIE of 2.58. However, there was no statistically significant gain in knowledge on survival life skills made by girls regardless of the location of the school.

Concerning religious affiliation, boys in Anglican affiliated and those in non-religious affiliated intervention schools made a significant improvement in knowledge on survival life skills ($t = 3.011$; $p < .05$) and ($t = 4.240$; $p < .05$) with a NIE of 3.10 and 8.70 respectively. Alike their counterparts, girls in catholic affiliated intervention schools made a significant improvement in knowledge on survival life skills ($t = 4.495$; $p < .05$) with a NIE of 4.48 contrary to girls in Anglican affiliated intervention schools who made a significant reduction in knowledge on survival life skills with a NIE of -5.51.

3.1.1 Overall Net Intervention Effect for Correct Knowledge on Survival Skills

Children from the intervention schools exhibited stronger knowledge of survival life skills growth from baseline to end line. However, overall, differences in mean scores between knowledge on survival life skills of children in the intervention and comparison schools were not statistically significant as illustrated in table 4.

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Table 4: Overall Net Intervention Effect for Correct Knowledge on Survival Skills

	Mean	Standard Error	t
Comparison			
Baseline	10.79		
End line	15.45		
Diff (End line – Baseline)	4.67	0.625	7.48***
Intervention			
Baseline	10.28		
End line	15.78		
Diff (End line – Baseline)	5.49	0.626	8.77***
Diff – in - Diff	0.82	0.885	0.355

Means and Standard Errors are estimated by linear regression ****Inference: *****

p<0.01; ** p<0.05; * p<0.1

Source: Primary data 2018

3.2. Children’s Knowledge of Personal Hygiene Skills

Findings in table 6 indicate average scores on knowledge of personal hygiene skills based on the assessment done in both the intervention and non-intervention schools according to children’s socio-demographic characteristics. On average, boys aged 12 years and girls aged 13 in the intervention and control schools at baseline and endline surveys by their socio-demographic characteristics (maximum score=9) had significant variations. Those in intervention schools made a significant improvement in knowledge on personal hygiene skills ($t = 2.405$; $p<.05$) and ($t = 2.612$; $p<.05$) with a NIE of 0.96 and 1.40 respectively. However, boys aged 14 years in the intervention schools made a significant decrease in knowledge on personal hygiene with a NIE of -1.62.

On average, boys in the intervention schools whose mothers were business women made a significant improvement in knowledge on personal hygiene skills ($t = 2.368$; $p<.05$) and with a NIE of 0.70. On the other hand, boys in the intervention schools whose mothers were medical workers and girls whose mothers are teachers made a significant decrease in mean scores of knowledges on personal hygiene skills with a NIE of -2.37 and -1.6 respectively. Boys in the intervention schools whose fathers were teachers and those fathers were medical workers made a significant improvement in knowledge on personal hygiene skills ($t = 2.157$; $p<.05$) and ($t = 3.416$; $p<.05$) with a NIE of 1.63 and 1.97 respectively. Likewise, boys in the intervention schools whose fathers were peasant farmers made a significant improvement in knowledge on personal hygiene skills ($t = 2.734$; $p<.05$) with a NIE of 1.01. Equally, girls whose fathers were in other professionals made a significant improvement in knowledge on personal hygiene skills ($t = 2.665$; $p<.05$) with a NIE of 1.59. However, there was a decrease in mean scores by NIE of -0.48 among boys and NIE of -0.64 among girls whose fathers were businessmen.

Boys whose both parents were alive showed an increase in knowledge on personal hygiene skills ($t = 1.856$; $p<.05$) with NIE of 0.37. In contrast, boys with no father and those whose both parents were dead showed a decrease in knowledge mean scores with a NIE of -0.75 and -0.98 respectively. Boys with no mothers in the intervention schools made a significant improvement in knowledge on personal hygiene skills ($t = 3.855$; $p<.05$) with a NIE of 1.83. Girls in the intervention schools with both parents alive made a significant

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improvement in knowledge on personal hygiene skills ($t = 4.075$; $p < .05$) with a NIE of 0.37. Boys and girls whose parents were married to each other showed a significant improvement in knowledge on personal hygiene skills ($t = 3.079$; $p < .05$) and ($t = 3.100$; $p < .05$) with NIE of 0.63 and 1.07 respectively. However, boys whose parents were not married to each other had a decrease on mean scores with NIE of -0.93.

In regard to religion, boys in Anglican affiliated and non-religious affiliated intervention schools made a significant improvement in knowledge on personal hygiene skills ($t=4.243$; $p < .05$) and ($t = 2.055$; $p < .05$) with a NIE of 1.31 and 1.16 respectively. However, boys in Muslim affiliated intervention schools made a reduction in mean knowledge scores on personal hygiene skills with a NIE of -1.02. There was no statistically significant increase or decrease in knowledge on personal hygiene skills made by girls regardless of any religious affiliation.

3.2.1. Overall Net Intervention Effect for Correct Knowledge on Personal Hygiene Skills.

Overall, although there were no statistically significant differences between correct knowledge on personal hygiene skills of children in the intervention and comparison schools, children from the intervention schools exhibited improved knowledge growth from baseline to end line as illustrated in table 5.

Table 5: Overall net intervention effect for knowledge on personal hygiene skills

	Mean	Standard Error	t
Comparison			
Baseline	4.80		
End line	5.43		
Diff (End line – Baseline)	0.63	0.207	3.05***
Intervention			
Baseline	4.81		
End line	5.60		
Diff (End line – Baseline)	0.79	0.207	3.81***
Diff – in - Diff	0.16	0.55	0.586

Means and Standard Errors are estimated by linear regression **Inference: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Source: Primary data 2018

3.3. Children's Knowledge of Pubertal Social Changes

Findings in table 8 show mean scores of knowledges on pubertal social changes based on assessments done in both the intervention and non-intervention primary schools by socio-demographics of children aged 10-14 years. On average, boys aged 12 years in the intervention and control schools at baseline and endline based on socio-demographic characteristics (Maximum Score = 8) had significant variations. Those in intervention schools made a significant improvement in knowledge on social changes ($t = 2.556$; $p < .05$) with a NIE of 0.82. Similarly, girls, aged 11 and 14 years in the intervention schools made a

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significant improvement in knowledge on social changes ($t = 0.280$; $p < .05$) and ($t = 2.128$; $p < .05$) with a NIE of 0.07 and 0.98 respectively. However, girls aged 13 years in the intervention schools made a significant decrease in knowledge on social changes with a NIE of -0.88.

Boys in the intervention schools whose both parents were dead made a significant improvement in knowledge of social changes ($t = 2.844$; $p < .05$) with a NIE of 0.71. In contrast, boys whose mothers and those whose fathers were live made a significant improvement in knowledge on social changes ($t = 2.315$; $p < .05$) and ($t = 1.721$; $p < .05$) with a NIE of 0.32 and 0.25 respectively. However, girls in the intervention schools whose mothers were alive had a significant decrease in knowledge on social changes with a NIE -0.01, and girls whose mothers are dead had a decrease with a NIE of -1.08. There were no statistically significant gains in knowledge on social changes made by girls whose parents were alive.

On average, boys in the intervention schools whose mothers were peasant farmers and teachers, made a significant improvement in knowledge on social changes ($t = 3.012$; $p < .05$) and ($t = 1.734$; $p < .05$) with NIE of 0.63 and 0.92 respectively. Similarly, boys in the intervention schools whose fathers were peasant farmers made a significant improvement in knowledge on social changes ($t = 2.600$; $p < .05$) with a NIE of 0.70. Relatedly, girls whose mothers were peasants and medical workers made a significant improvement in social changes ($t = 0.360$; $p < .05$) and ($t = 1.838$; $p < .05$) with a NIE of 0.09 and 0.48 respectively. Also, boys in the intervention schools with both parents married to each other made a significant increase gain in knowledge on social changes ($t = 2.053$; $p < .05$) with a NIE of 0.34.

Relatedly, boys in the intervention day schools made a significant gain in knowledge on social changes ($t = 2.815$; $p < .05$) with a NIE of 0.43. Boys in the rural-based intervention schools made a significant gain in knowledge on social changes ($t = 3.203$; $p < .05$) with a NIE of 0.60. However, there was no statistically significant gains in knowledge on social changes made by girls in both rural and urban schools. Boys in catholic affiliated intervention schools made a significant improvement in knowledge on social changes ($t = 1.791$; $p < .05$) with a NIE of 0.35.

3.3.1 Overall Net intervention Effect for Correct Knowledge of Pubertal Social Changes

Overall, there were no significant differences between correct knowledge on social changes of children in the intervention and comparison schools. Children from the intervention group exhibited strongest knowledge growth from baseline to end line as illustrated in table 6.

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Table6: Overall net intervention effect for correct knowledge of pubertal social changes

	Mean	Standard Error	t
Pre	6.20		
Post	7.27		
Diff (Post – Pre)	1.07	0.147	7.29***
Treatment			
Pre	6.11		
Post	7.25		
Diff (Post – Pre)	1.14	0.147	7.75***
Diff – in - Diff	0.07	0.208	0.33

Means and Standard Errors are estimated by linear regression **Inference: *** p<0.01; ** p<0.05; * p<0.1

Source: Primary data 2018

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4. Discussion

A 2-day teacher training program on the implementation of an intervention aimed at enhancing children's knowledge of survival skills, personal hygiene skills, and pubertal social changes among primary school children aged 10-14 years in Jinja was conducted among two teachers in each of the eight intervention schools. Trained teachers implemented the intervention for six weeks. At an evaluation of effectiveness of the intervention after six weeks of its implementation, increase in knowledge was seen in three areas: - life skills, personal hygiene and social changes. This is because children aged 10-14 years are easier to teach, they are eager to learn compared to older children (Search Institute, 2020; Watkins, 2020). These young adolescents are much able to think like adults, but then they don't have the experience and judgment needed to act like adults, hence, they need strong support to help them develop confidence to make positive choices as they sort out who they are and how they fit in society/schools (Search Institute, 2014). Likewise, children at this stage are motivated to learn because of their natural curiosity and desire to understand more about themselves, their bodies and influence that different things have on them (Whitener, Cox, & Maglich, 1998). This current study is among few studies to evaluate a right-based intervention in an effort to enhance knowledge of life skills, personal hygiene and pubertal social changes among primary school children in Uganda. The discussion is focused on change in knowledge levels in relation to survival of parents, parents' occupation, parents' marital status, and religious affiliation of the school.

4.1 Knowledge of Survival Life Skills

After the intervention, our study registered an increase in knowledge on survival life skills among children from intervention schools. Specifically, children aged 12-14 years made an increase in knowledge on survival life skills. In line with Uganda's National Sexuality Education Framework, ages 10-12 years is when children develop survival skills in self-awareness, coping with emotions, coping with stress and goal-setting among others (MoES, 2018). According to United Nations Convention on the Rights of the Child [UNCRC], every child has the right to life, and this means that governments must do all they can to ensure that children survive and develop to their full potential (United Nations, 1989). Equally, according to Article 5 of the African Charter on the Rights and Welfare of the Child, every child has an inherent right to life that is supposed to be protected by law (OAU, 1990). It is thus implied that State Parties like Uganda shall ensure to the maximum extent possible, the survival, protection and development of every child.

Boys whose parents were peasants made an increase in knowledge on survival life skills. This literally means that some parents who are peasants (without formal employment) tend to have time for their children and may end up imparting life skills among their children as was the case during Covid-19 pandemic (Mathew, 2017). It should be noted that life skills strengthens the ability of an individual to meet needs and demands of the present society (Prajapati, 2017). They are essential for your child to learn how to be independent and become self-sufficient (Hamaker, 2016). Conversely, children whose both parents were dead made an increase in knowledge of survival life skills, a signal that orphans tend to receive much attention from close relatives or other community members in regard to survival skills' training. In the same way, boys whose mothers were alive and were in the intervention schools made an increase in knowledge on survival life skills. Mothers are found of having intimate relationship with their children and this may explain why boys in the intervention

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schools had increased knowledge in survival skills. On the other hand, boys and girls with no fathers and were in the intervention schools made an increase in knowledge on survival life. Helsen and colleagues (2000), suggested that having a parent to guide teenagers during puberty is fundamental in equipping them with relevant life skills. Equally, Henricson and Roker (2001), highlighted the added advantage(s) to any child whose parents raise them together in a happy marriage. Evidently, children entirely depend on their mothers who are believed to be good at imparting life skills compared to their counterparts. Elsewhere, the presence of fathers had mixed effects on their children's survival skills (Gray & Anderson, 2015; Sear & Mace, 2008). Moreso, a recent study conducted in Jinja found lack of survival skills among adolescents (Nabugoomu et al., 2020).

Concerning religious affiliation, boys in Anglican affiliated and non-religious affiliated intervention schools made an increase in knowledge on survival life skills. Unlike boys, girls in catholic affiliated intervention schools made an increase in knowledge on survival life skills. Regardless of the religious affiliation, schools are proved to be effective in as far as transferring survival life skills in children is concerned. That is, life skills education bridges the gap between basic functioning and capabilities. It also strengthens abilities of an individual to meet the needs and demands in the present society (Prajapati, 2017).

4.2 Knowledge of Personal Hygiene Skills

Findings of this study demonstrated that children aged 12 and 13 years made an increase in knowledge on personal hygiene skills from baseline to endline. Our findings are consistent with the Uganda National Sexuality Education Framework which considers ages 10-12 years to be the time when children develop skills of health seeking behavior (MoES, 2018). The teaching of hygiene education together with good life skills' tests (Jens-Holger, 2018) may account for this increased knowledge on personal hygiene skills in all intervention schools. Similarly, a school-based cross-sectional descriptive study conducted in Delta Nigeria revealed a high level of knowledge related to basic personal hygiene skills among the school children (Oyibo, 2012). Also, State Parties to the African Charter on the Rights and Welfare of the Child ensures that all key stakeholders of the society especially parents, children, community leaders and community workers are informed and supported in the use of basic knowledge of child health and nutrition, hygiene and environmental sanitation and the prevention of domestic abuse (OAU, 1990).

In regard to parent's occupation, boys in the intervention schools whose mothers were business women and girls whose mothers were medical workers made an increase in knowledge on personal hygiene skills. This is probably due to the fact that employed parents especially mothers are in position to afford water, sanitation and hygiene (WASH) materials for their daughters. A similar study conducted among school-going adolescent girls revealed that mothers were the main source of information in regard to menstrual hygiene (Jain, Anand, Dhyani, & Bansal, 2017). Likewise, boys in the intervention schools whose fathers were peasants, teachers and medical workers made an increase in knowledge on personal hygiene skills. Moreso, girls in the intervention schools whose fathers were in other professional category made an increase in knowledge on personal hygiene skills. Boys whose parents were married to each other and girls whose parents were not married to each other made an increase in knowledge on personal hygiene skills. These findings imply that parents' marital status has nothing to do with children's knowledge on hygiene skills. A study

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conducted among Americans revealed that among those who are married or cohabiting, parents who work full time are more likely than other parents to spend too little time with their children (Pew Research Center, 2015).

Boys in Anglican affiliated and non-religious affiliated intervention schools made an increase in knowledge on personal hygiene skills compared to those from Muslim affiliated intervention schools. Bearing in mind that Islamic law requires Muslims to ritually clean their body before praying, these findings portray that administration in Muslim schools might assume that hygiene-related knowledge is mainly transferred to children through the mosque setting compared to schools (Aslan, 2020). However, religion is certainly not the only reason for the above discrepancy, it should be noted that many other factors may play an equal or greater role, including economic, geographic, cultural factors and political conditions within a region (Pew Research Center, 2016).

Based on our knowledge, there is paucity of studies in Uganda on school-based interventions to promote personal hygiene among school children especially those aged between 10-14 years. Yet, personal hygiene is particularly important during puberty as the body begins to produce more hormones that can increase the amount of sweat, oil and body odor (GDHR, 2022). Positively, these changes create a need for new hygiene habits during puberty (Puberty Curriculum, 2022). On the other hand, earlier studies aimed at improving hygiene skills at schools have not taken the holistic approach (Pradhan, Mughis, Ali, Naseem, & Karmaliani, 2020), yet personal hygiene habits are a way our children can develop responsibility (Puberty Curriculum, 2022) as conceptualized in this study.

4.3 Knowledge of Social Changes

Our findings showed that the intervention yielded positive outcomes in regard to increased knowledge of pubertal social changes among children. This is probably due to the fact that the UN Convention on the Rights of the Child, urges State Parties to ensure that every child has the right to a standard of living that is good enough to meet their social needs and support their development (United Nations, 1989). However, findings of this study showed that girls in the intervention schools whose mothers were alive or dead made a decrease in knowledge on social changes, an implication that girls might learn pubertal social changes not necessarily from their mothers. Hence, this makes adolescent girls vulnerable (UNICEF, 2015). Instead, boys in the intervention schools whose parents were dead or alive made an increase in knowledge on social changes.

Children in the intervention schools whose parents were peasants made an increase in knowledge on social changes, that is, peasant parents are considered to have additional time for their children (Mathew, 2017). On the other hand, children whose mothers were professionals made an increase in knowledge on social changes. Likewise, boys in the intervention schools with both parents married to each other made an increase in knowledge on social changes. These findings imply that a parent's everyday experiences with the child are fundamental to his/her social skills development (Scan Families, 2022). Boys in catholic affiliated intervention schools made an increase in knowledge on social changes compared to other schools with other religious affiliations. These findings may explain why the catholic church is often accused of being patriarchal in nature as patriarchy promotes male supremacy in the spiritual and physical realms as well as in social and personal spheres (Burbidge, 2015; Wood, 2019). Generally, findings of this study indicated increased knowledge of social changes among children in the intervention schools suggesting that awareness of pubertal

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social changes develop during the course of puberty (Burnett, Thompson, Bird, & Blakemore, 2011).

4.4 Conclusion

The study found an increase in knowledge of life skills, personal hygiene and pubertal social changes among children in the intervention schools, an indication that the rights-based intervention was effective. Generally, boys registered increased knowledge after the intervention compared to their counterparts. In regard to life skills, children from Anglican and non-religious affiliated schools benefited more compared to catholic affiliated schools that benefited from pubertal social changes only. Notwithstanding, parents' occupation had the biggest impact on knowledge improvement on pubertal social changes compared to other socio-demographics. It is thus imperative for married couples to be economically empowered for the realization of positive pubertal social changes among young adolescents.

4.5 Recommendations

There is a need to scale up such interventions to control/comparison schools, in other schools across the country. And schools in similar contexts in low developed counties. In regard to life skills and pubertal social changes, forthcoming interventions should pay more attention to the girl child and socio-economic empowerment of married women in Uganda. Rural schools are generally known for poor menstrual hygiene and poor management of pubertal changes. There is therefore need to bring rural schools to the level of urban schools in terms of equipping children with knowledge of life skills, personal hygiene and social changes for better management of pubertal changes.

4.6 Policy implications

Our study is among few interventional studies conducted in Uganda to evaluate the effectiveness of a rights-based intervention among primary schools. This study's findings render support to the education system to consider designing and implementation of school-based pubertal information interventions to primary school children in both rural and urban Uganda. To this effect, Uganda's National Curriculum Development Centre (NCDC) vetted the intervention curriculum and approved it as supplementary materials for teaching child health, body changes and child protection in primary schools in Uganda. The supporting school environment in Uganda should be replicated to other schools, as schools are the best places to cultivate and nurture the young and developing mind of the adolescents. Reducing the inequality between the rural and urban setups in menstrual hygiene management, schools could play roles in availing menstrual hygiene materials to the rural school girls.

Authors' contributions

SBN designed the study, trained research assistants, supervised data collection process, designed and pretested the intervention, interpreted the data, and drafted the first manuscript; RN analysed the data; AB supervised the improvement of the manuscript ; LN and NMT supervised study designing, data collection, data analysis revised and approved the manuscript.

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