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**Evaluation of the Effectiveness of a Rights-based Intervention in enhancing Knowledge of Pubertal Body Changes, Sexual Reproductive Health Risks and Children Rights in Jinja, Uganda: A Randomized Control Trial**

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**Abstract**

Puberty is a complex, integrative, and coordinated transition from childhood to adulthood. It is marked by changes in body, brain, behaviour, cognition and emotions, and there is a close link between puberty and sexuality as it is the time when young adolescents tend to engage in riskier sexual behavior. This stage calls for educating children about their SRH rights for self-protection against abuse. This study aimed at evaluating the effectiveness of a school based curriculum intervention to enhance knowledge of the pubertal body changes, sexual reproductive health risk factors and children's rights as means of protection against child abuse and exploitation among primary school children aged 10-14 years in Uganda. We employed a randomised controlled trial to evaluate the effectiveness of the intervention. We used a self-administered questionnaire to collect baseline data from children in 16 primary schools. Baseline data was analysed to identify physical pubertal body changes, SRH-related risks and child rights knowledge gaps. A rights-based curriculum intervention was pre-tested to address the identified knowledge gaps. The 16 selected schools were randomly divided into intervention and comparison arms-eight in each arm. Two teachers from each of the eight intervention schools were trained after which they implemented the intervention for six weeks. Endline data was collected from children in all the 16 schools who had taken part in the baseline study using the same questionnaire administered at 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).

Children in the intervention schools registered increased knowledge on pubertal physical changes and children rights from baseline to endline. Boys aged 10 and 11 years in intervention schools showed significant improvement in knowledge of pubertal physical changes ( $t = 2.024$ ;  $p < .05$ ) and ( $t = 2.024$ ;  $p < .05$ ) by a Net Intervention Effect (NIE) of 2.5 and 2.11 respectively compared to girls. The intervention was most effective among children aged 12 and 14 years most especially those from catholic affiliated schools, and those whose parents were dominantly peasant farmers. Generally, changes in knowledge of children's SRH rights were significant in the intervention schools. There was an increase in knowledge of physical changes, and rights among children in the intervention schools. Children from catholic affiliated schools benefited most from the intervention. A longitudinal study in most regions of Uganda is desired.

**Key Words:** Primary School Children, Effectiveness, Rights-based Intervention, Pubertal Body Changes, Children Rights, Uganda

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By

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**1.0 Introduction and Background**

**1.1 Background**

Puberty is a complex, integrative, and coordinated transition marked by changes in the body, brain, behavior, cognition and emotions (Mendle, Beltz, Carter, & Dorn, 2019). It involves rapid growth, development and maturation in terms of physical, psychological and social circumstances (Yaziki, Dolgun, Ozturk, & Yilmaz, 2011). Puberty is a major life transition from that of a non-reproductive juvenile into a reproductively competent adult (Holder & Blaustein, 2014). For both boys and girls, this transition from childhood to adulthood may be presented as exciting, marking a major change in ones' life (UNESCO, 2018a). However, many boys and girls approach adulthood while receiving inaccurate, incomplete or judgement-laden information affecting their physical, social and emotional development. This inadequate preparation exacerbates the vulnerability of children to exploitation and other harmful outcomes (UNESCO, 2018a).

Globally, only 34% of young people can demonstrate accurate knowledge of HIV prevention and transmission (UNESCO, 2018b). Similarly, two out of the three girls in some countries have no idea of what is happening to them when they begin menstruating (UNESCO, 2018b). In many countries, menstruation is a neglected issue leaving a large number of girls with knowledge gaps and misconceptions, a situation that makes them unprepared when they begin menstruating (Chandra-Mouli & Vipul-Patel, 2017). On the other hand, there is a close link between puberty and sexuality, when adolescents engage in sexual behavior at young ages, they tend to engage in riskier sexual behaviors (Baams, 2015) which may lead to early pregnancies and humiliation in girls (UNICEF, 2015). In fact, early marriages, early initiation of sex and lack of access to reproductive health information and services are the leading drivers of adolescent pregnancy in the world (UNFPA, 2007; UNICEF, 2008). Hence, there is a need to appreciate the differences in body changes among children during puberty and understand that male and female hormones differ and affect body-changes differently (Burnett, Thompson, Bird, & Blakemore, 2011; MoES, 2018). This enables them cope with romantic feelings during puberty. Boys and girls get to know that their family and societal expectations begin to change during puberty (MoES, 2018).

In sub-Saharan Africa (SSA), An estimated 15 million adolescents get married before 18 years of age each year, with 90% of births within marriage recorded among 15 to 19-year-olds (UNICEF, 2013b). In this region, sexual and reproductive health issues affecting adolescent girls and boys include unsafe abortions, complications during pregnancy and childbirth, and gender-based violence and fatherhood during their adolescent years (Ezeh et al., 2016; Madiba & Nsiki, 2017). This partly due to fear of personal, social, and economic consequences of high-risk sexual behaviour act as drivers for communication (Usonwu, Ahmad, & Curtis-Tyler, 2021). It is reported that majority of very young adolescents reside in developing countries like Uganda where achieving good sexual and reproductive health

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can be a challenge (Woog & Kågesten, 2017). Compared to all countries in East and Southern Africa, girls aged 10-19 have higher than average rankings of individual and community level vulnerability (Amin et al., 2013). Hence, there a need for sexual reproductive health programs that account for cultural and social influences including those from families, peers, and communities (Usonwu et al., 2021).

In Uganda, children take up a bigger percentage of the population. Based on the National Population and Housing Census of 2014, children in Uganda were 55% of the population (UBoS, 2017). With the most youthful populations in the world, Uganda has one of the highest teenage pregnancy rates in sub-Saharan Africa with 20% of women reporting beginning sexual activity before the age of 15 (GoU, 2018; UBoS and ICF, 2017). It is reported that about 26% of the girls and 23% of the boys aged 10-14 years in Southwestern Uganda had started menstruation and wet dreams' experiences respectively (Kemigisha et al., 2018). In regard to SRH risk factors, a study conducted among very young adolescents in South Western Uganda reported that 7.6% had ever had sex yet 90% of the adolescents were not using any form of protection against STIs and early pregnancies (Kemigisha et al., 2018). Similarly, a study conducted in Eastern Uganda and school going teenagers showed inadequate information about reproductive health with 75% of the respondents believing that the minimum age for conception is 14 years (Manzi et al., 2018). According to the Uganda Demographic and Health Survey 2016, more than one out of four adolescents become pregnant. This issue is of a particular concern in Busoga region located in Eastern Uganda (UBoS and ICF, 2017). This shows the government of Uganda ought to educate, sensitize and empower all children with pubertal knowledge and a general understanding of both body changes and sexual life of being self-conscious, watchful to make sure that they know what is happening to them during this stage so that they are able to deal with the circumstances (De Guzman, 2007).

These are some of the reasons why there is an urgent need to empower children in their respective societies. Positively, the child rights-based approach utilized in our study empowers both boys and girls to know and claim their rights (Save the Children, 2010). However, little has been documented about the effectiveness of school-based interventions (Herlitz, MacIntyre, Osborn, & Bonell, 2020). Therefore, we conducted a study to understand the effectiveness of the right-based approach in enhancing knowledge of pubertal changes, SRH risk factors, and child rights among primary school children aged 10-14 years.

## **1.2 Statement of the Problem**

Many children face puberty which is a complex, integrative, and coordinated transition from childhood to adulthood while still in primary schools. Previously, it was a cultural responsibility of parents, aunties, uncles and grandparents to talk to children about puberty and growing up (Usonwu et al., 2021) but this has been affected by the breakdown in some African family settings (Akuma, 2015), education and foreign religion (Mawusi, 2013). Thus, educational institutions are expected to pay maximum attention to issues of puberty among boys and girls most especially those in primary schools. However, research on adolescence programs designed to improve access to SRH information and other services mainly focus on the rights of children aged 15-19 years in secondary schools (Mutea et al., 2019; Ninsiima, Chiumia, & Ndejjo, 2021). Similarly, the question of child rights in education is an issue that is very current but not much studied (Stamatović & Cicvarić, 2019). This leaves primary schools often lacking sufficient systematic and comprehensive understanding and guidance

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on children's rights in regard to puberty. By facing this fundamental phase of life unprepared, children are left confused and unsupported, which in turn affects their sexual behaviour, school attendance and the quality of their lives.

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### **1.3 Aim of the Study**

The study aimed at evaluating the effectiveness of a rights-based curriculum intervention to enhance the knowledge of pubertal physical changes, SRH risk factors and children's rights among the 10-14 years old children in primary schools in Jinja, Uganda.

## **2.0 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 the district belong to the Basoga ethnic group where Lusoga and Luganda are the most widely spoken local languages. Jinja is divided into two administrative units, i.e., Jinja City (Urban) and Jinja District (Rural). Jinja rural is composed of two counties: - Kagoma and Butembe. Jinja Municipal 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 Municipal Education Office.

**Table 1. Number of Primary Schools in Jinja District**

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

**Source: Field data 2018**

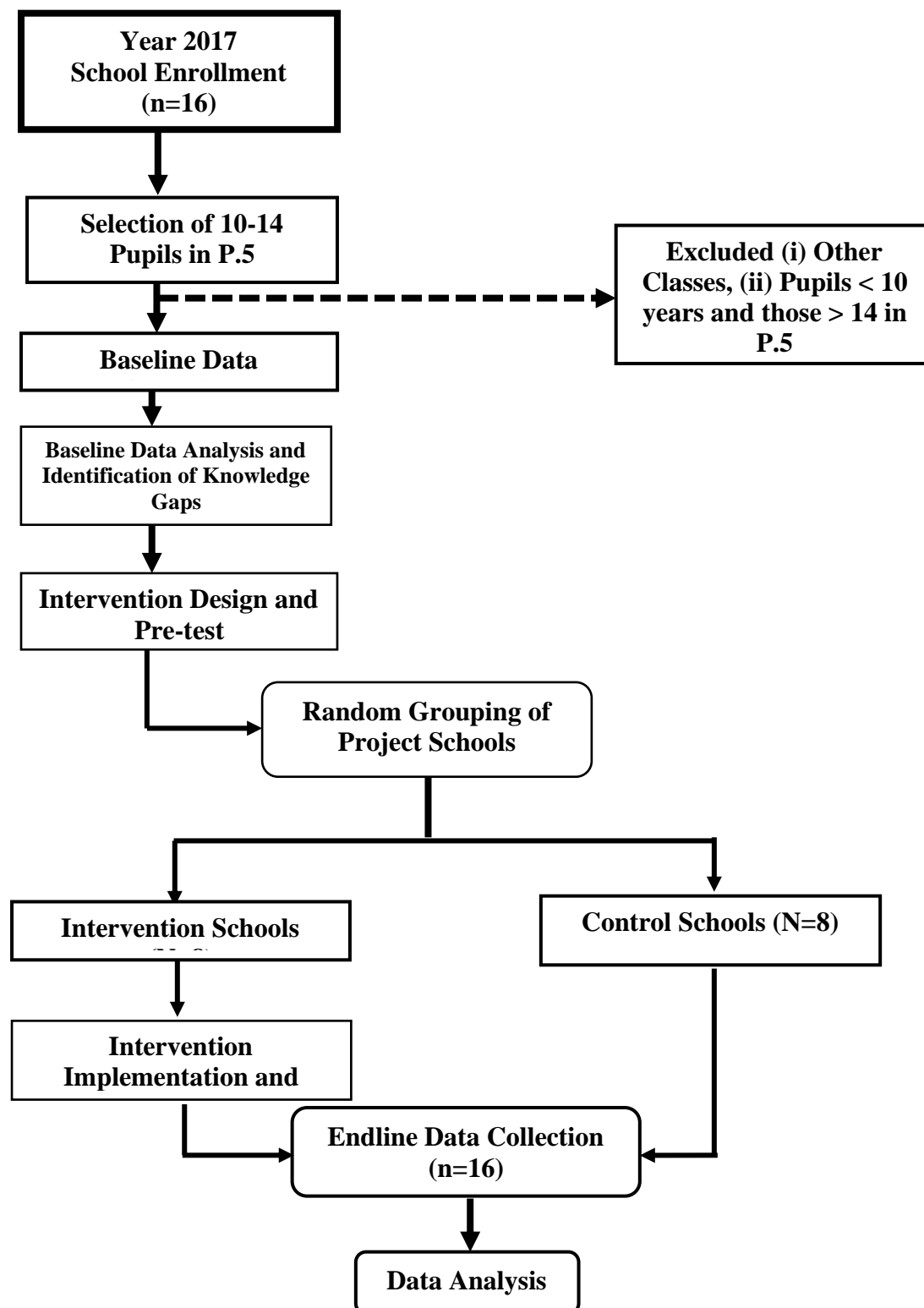
### **2.2 Study Design and Setting**

We employed a Randomised Control Trial (RCT) to evaluate the effectiveness of a rights-based intervention to enhance knowledge of pubertal body changes, SRH-related risk factors

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and children rights among school children aged 10-14 years in Jinja, Uganda. We conducted this study in 16 primary schools. Six urban schools were purposively selected from Jinja Municipal and Ten rural schools were also purposively selected from Kagoma County. 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 among others. Jinja was desired because according to the Uganda Police Annual Crime and Traffic/Road Safety Report 2013, Jinja was ranked the district with highest cases of child sexual abuse in Busoga (Uganda Police Force, 2013). Busoga region is well known for early pregnancies, early marriages and school dropout (Nabugoomu, Seruwagi, & Hanning, 2020). Our study is in line with the CONSORT guidelines for reporting randomized controlled trials (Schulz, Altman, Moher, & The Consort Group, 2010).

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**Fig. 1 Flow Chart Showing the Distribution of Participating Schools and Participants**  
Source: Primary Data collection design 2018



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### **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 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 the time 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, 2013a).

### **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 x<sup>th</sup> percentage point of the standard normal distribution,

$\Delta$  the clinically important difference in treatment means and

$\delta^2$  the variance in the outcome.

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

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

Therefore, the number needed in each arm was = 399.8  $\approx$  400 giving a total of 800 participants.

### **2.5 Data Collection and Intervention Procedures**

Data was collected in two phases, i.e., during baseline and endline/post intervention surveys.

**2.5.1 Baseline data collection:** We used a self-administered questionnaire (SAQ) developed and pretested by the research team to collect quantitative baseline data from the 16 selected primary schools. The questionnaire was designed to assess what children know about body changes, SRH risk factors and children's rights among other things. Baseline data was analysed and knowledge gaps were identified.

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**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 physical body changes that occur at puberty, children's rights and responsibilities, personal hygiene and life skills 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 teachers from the 8 intervention schools were trained at a 2-day workshop. At the beginning of the training, teachers were asked what they knew about pubertal changes, personal hygiene 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; 15 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 mention 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 training, teachers in each intervention school taught the curriculum to the whole of Primary Five 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 3:30pm and children go for co-curricular activities. To avoid interfering with the official class time, the intervention was taught on every school day starting from 3:30pm-4:30pm.

**2.5.5 Monitoring and evaluation of the intervention implementation process:** 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; from the Eight intervention and Eight comparison schools. The same questionnaire that was administered at baseline data collection was again administered to the same children who participated in endline survey.

## **2.6 Outcome Variable**

These were the difference in difference in knowledge scores at baseline and at endline. We calculated a total knowledge score 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



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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 2.

**Table 2. Showing Maximum Knowledge Scores at Baseline and Endline**

<b>Outcome variable</b>	<b>Items used</b>	<b>Coding</b>
Pubertal Physical Changes	20	Coded 1 if answer is correct and 0 if otherwise
Children Rights	10	Coded 1 if answer is correct and 0 if otherwise
SRH-related Risks	12	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. Endline data was compared with baseline data to establish the intervention effect. Thus, the Net Intervention Effect (NIE) was estimated as the difference between intervention and comparison/control groups regarding changes in means from baseline to endline. The effect is a linear combination of four independent estimates. *P*- Values from a t-test and 95% confidence intervals for the intervention effect were calculated based on normal distribution assumption. *P*- Value of 0.05 was considered a statistically significant result.

### **2.8 Ethical Considerations**

Ethical considerations were rigorously streamlined by the Higher Degree Research Ethics Committee (HDREC) of Makerere University School of Public Health (MUSPH), and Uganda national council for Science and technology (UNCST). Consent and assent were sought from all head teachers and children that participated in this study respectively. The study was conducted in accordance with the four basic research ethical principles namely; respect for persons, beneficence (limited harm, sound design and competent investigators), no evil, and justice - morally right, and distributive (UNCST, 2007).

## **3.0 Results**

### **3.1 Children’s Knowledge of Pubertal Body Changes**

Table 3 describes mean scores of children’s knowledge of pubertal body changes according to their socio-demographic characteristics in both the intervention and control schools at baseline and endline (Maximum Score=20). Findings revealed that boys aged 10 and 11 years in intervention schools showed a significant improvement in knowledge of pubertal physical changes ( $t=2.024$ ;  $p<.05$ ) and ( $t=2.024$ ;  $p<.05$ ) by a Net Intervention Effect (NIE) of 2.5 and 2.11 respectively while those aged 14 years showed a decrease with NIE of -4.2.

Regarding survival of parents, girls with no mothers had a significant decrease in knowledge on physical changes with a NIE of -4.93 while girls who were entirely orphans made a significant improvement in knowledge on pubertal physical changes ( $t=3.288$ ;  $p<.05$ ) with a NIE of 3.15, however, this was not the same case with orphaned boys.

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Regarding parents' occupation, boys and girls whose fathers were peasants made a significant improvement in knowledge on pubertal physical changes ( $t=4.077$ ;  $p<.05$ ) and ( $t = 3.418$ ;  $p<.05$ ) with NIE of 3.42 and 3.16 respectively. However, there was a decrease in knowledge among the boys whose fathers were teachers and businessmen by NIE of -2.47 and -1.50 respectively. On average, boys whose mothers were peasant farmers and businesspersons made a significant improvement in knowledge on pubertal physical changes ( $t = 3.412$ ;  $p<.05$ ) and ( $t=2.703$ ;  $p<.05$ ) with a NIE of 2.57 and 2.11 respectively. On the other hand, boys whose mothers were teachers and medical workers showed a significant decrease in knowledge by NIE of -8.21 and -5.20 respectively. Girls whose mothers were medical workers, and business women had a significant increase in knowledge on pubertal physical changes ( $t=3.460$ ;  $p<.05$ ) and ( $t=2.907$ ;  $p<.05$ ) with NIE of 5.72 and 2.65 respectively. Contrariwise, girls in the intervention schools whose mothers were teachers made a significant decrease in knowledge on physical changes with a NIE of -9.59.

In terms of school type, girls in the intervention day and boarding schools made a significant improvement in knowledge on pubertal physical changes ( $t=5.787$ ;  $p<.05$ ) with NIE of 4.19 whereas boys in day and boarding schools made a significant reduction in knowledge on physical changes into a NIE of -2.21. Nonetheless, girls in the rural based intervention schools made a significant reduction in knowledge on physical changes by NIE of -1.15. In contrast, girls in catholic affiliated intervention schools made a significant improvement in knowledge on pubertal physical changes ( $t=4.069$ ;  $p<.05$ ) with a NIE of 2.76. Religion always instills morals and ethical values that help restrain the behavior of teenager. The study took in consideration the religious affiliation of the schools that the teenagers attended and it was revealed that 42.2% were Catholic, Anglican (36.9%), Muslim (14/1%), whereas 6.8% were not affiliated to any religion.

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**Table 3: Mean Scores of Knowledge on Pubertal Body Changes in the Intervention and Control Schools at Baseline (BL) and Endline (EL) by Socio-demographic Characteristics of Children (Maximum Score = 20).**

Variables	Overall (N)	BOYS										GIRLS								
		Control (mean)			Intervention (mean)			Paired t-test				Control (mean)			Intervention (mean)			Paired t-test		
		BL	EL	D	BL	EL	D	NIE	SE	t	BL	EL	D	BL	EL	D	NIE	SE	t	
<b>Age</b>																				
10	153	6.70	6.64	-	6.56	9.00					6.00	6.25		8.95	10.00					
				0.06			2.44	2.50	1.235	2.024**			0.25			1.05	0.80	0.966	0.829	
11	166	6.92	7.29	0.37	7.31	9.79	2.48	2.11	1.035	2.039**	5.96	7.22	1.26	7.38	9.25	1.87	0.61	0.908	0.672	
12	175	6.66	6.37	-	10.05	9.66	-	-			5.92	6.11		10.15	11.62					
				0.29			0.39	0.10	1.039	-0.096			0.19			1.47	1.28	0.832	1.538	
13	175	6.87	6.81	-	10.24	11.00					7.29	8.80		10.75	9.62	-	-	-	-	
				0.06			0.76	0.82	0.911	0.900			1.51			1.13	2.64	1.074	2.458**	
14	94	7.80	9.54		12.21	9.93	-	-			5.71	8.33		8.20	13.21					
				1.74			2.28	4.02	1.347	2.985**			2.62			5.01	2.39	1.771	1.350	
<b>Mother alive</b>																				
Yes	705	7.02	7.05	0.03	9.42	9.85	0.43	0.40	0.464	0.862	6.28	7.12	0.84	9.00	10.75	1.75	0.91	0.491	1.854	
No	55	5.33	7.00		11.50	10.33	-	-			3.80	7.31		10.42	9.00	-	-	-	-	
				1.67			1.17	2.84	1.486	-1.911			3.51			1.42	4.93	1.745	2.824**	
<b>Mother's occupation</b>																				
Peasant Farmer	292	6.19	6.31	0.12	8.31	11.00	2.69	2.57	0.753	3.412**	5.00	6.83	1.83	8.22	10.88	2.66	0.83	0.801	1.036	
Teacher	71	9.73	9.94		16.00	8.00	-	-			6.50	15.75		9.14	8.80	-	-	-	-	
				0.21			8.00	8.21	2.005	4.096**			9.25			0.34	9.59	1.704	5.629**	
Medical worker	51	4.63	6.33		10.00	6.50	-	-			6.50	5.20	-	8.33	12.75					
				1.70			3.50	5.20	1.384	3.757**			1.30			4.42	5.72	1.653	3.460**	
Businesswoman	207	7.50	6.71	-	8.68	10.00					7.10	6.31	-	9.09	10.95					
				0.79			1.32	2.11	0.781	2.703**			0.79			1.86	2.65	0.912	2.907**	
Others	84	10.4	7.67	-	14.57	8.73	-	-			6.94	8.43		10.45	10.47					
				2.73			5.84	3.11	1.789	-1.738			1.49			0.02	1.47	1.125	-1.306	
<b>Father alive</b>																				
Yes	656	6.90	7.06		9.69	9.87					5.99	7.37		8.89	10.69					
				0.16			0.18	0.02	0.482	0.041			1.38			1.80	0.42	0.508	0.826	
No	111	6.69	6.93		9.20	9.89					7.29	6.22	-	10.52	10.40	-				
				0.24			0.69	0.45	1.319	0.341			1.07			0.12	0.95	1.157	0.821	
<b>Father's occupation</b>																				

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Peasant Farmer	210	7.29	5.68	-	9.22	11.03	1.81	3.42	0.839	4.077**	4.65	5.71	1.06	7.45	11.67	4.22	3.16	0.925	3.418**				
Teacher	71	7.71	8.18	0.47	11.67	9.67	-	-	2.00	2.47	1.438	-1.718	8.13	8.40	0.27	9.70	10.50	0.80	0.53	2.097	0.253		
Medical worker	50	8.40	8.40	0.00	7.50	10.67	3.17	3.17	1.745	1.817	6.44	8.53	2.09	9.25	10.22	-	-	0.97	1.12	1.537	-0.728		
Businessman	195	6.17	6.78	0.61	9.77	8.88	-	-	0.89	1.50	0.797	-1.882	6.37	6.92	0.55	9.56	8.80	-	-	0.76	1.31	0.959	-1.366
Others	129	6.62	9.77	3.15	10.27	8.86	-	-	1.41	4.56	1.252	3.643**	6.16	6.11	0.05	9.06	11.11	2.05	2.10	0.929	2.261**		
<b>Both parents alive</b>																							
Yes	639	6.82	6.88	0.06	9.91	9.65	-	-	0.26	0.32	0.476	-0.673	6.04	7.86	1.82	8.90	10.60	-	-	1.70	0.12	0.522	-0.230
No	128	7.19	8.00	0.81	8.33	10.81	2.48	1.67	1.277	1.308	6.82	4.47	-	10.31	11.11	2.35	0.80	3.15	0.958	3.288**			
<b>Parents married</b>																							
Yes	526	6.99	6.83	-	9.78	9.60	-	-	0.18	0.02	0.517	-0.039	6.26	7.55	1.29	9.13	10.93	1.80	0.51	0.603	0.846		
No	241	6.57	7.53	0.96	9.21	10.67	1.46	0.50	0.938	0.533	5.93	6.51	0.58	9.23	10.18	0.95	0.37	0.707	0.523				
<b>Type of school</b>																							
Day	616	6.94	6.69	-	8.50	9.19	0.69	0.94	0.510	1.843	5.45	6.99	1.54	8.90	10.09	-	-	1.19	0.35	0.545	-0.642		
Day and Boarding	151	6.82	10.45	3.63	10.35	11.77	1.42	2.21	1.005	2.199**	9.32	8.00	-	9.34	12.21	1.32	2.87	4.19	0.724	5.787**			
<b>Location of school</b>																							
Urban	373	6.53	6.78	0.25	8.54	8.48	-	-	0.06	0.31	0.658	-0.471	6.82	7.69	0.87	8.45	9.50	1.05	0.18	0.707	0.255		
Rural	394	9.21	7.35	1.86	12.19	10.76	-	-	1.43	0.43	0.617	0.696	5.03	6.49	1.46	11.27	11.58	-	-	0.31	1.15	0.608	1.892**
<b>Religious affiliations of school</b>																							
Catholics	324	7.10	7.12	0.02	9.06	8.86	-	-	0.20	0.22	0.886	-0.248	6.37	5.17	-	1.20	8.23	9.79	1.56	2.76	0.678	4.069**	
Anglican	283	7.67	6.91	0.76	9.79	9.90	0.11	0.87	0.720	1.208	5.89	6.56	0.67	9.80	9.65	-	-	0.15	0.82	0.759	-1.080		
Muslim	108	5.25	6.62	-	9.80	11.64	1.84	-	1.218	0.386	3.75	7.83	4.08	8.59	9.00	0.41	-	1.511	-				

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None		6.50	7.83	1.37		9.44	9.29	-	0.47			6.86	8.60		12.50	11.39	-	3.67	2.429**	
	52			1.33				0.15	1.48	1.218	-1.215			1.74			1.11	2.85	1.992	-1.431

**D = Mean difference, SE = standard error, NIE = net intervention effect (difference in intervention area from baseline to end line minus difference in comparison area from baseline to end line).**

**Source Primary data 2018**

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### **3.1.1 Overall Net Intervention Effect for Correct Knowledge on Pubertal Body Changes**

Children from the intervention schools exhibited the stronger knowledge growth of physical changes from baseline to endline. However, the overall differences between knowledge mean scores of children in the intervention and control schools were not statistically significant as seen in table 4.

**Table 4. Overall Net Intervention Effect for Knowledge on Pubertal Body Changes**

<b>Variable</b>	<b>Mean</b>	<b>Standard Error</b>	<b> t </b>
<b>Control</b>			
Baseline	6.53		
End line	9.34		
Diff (End line – Baseline)	2.81	0.453	6.21***
<b>Intervention</b>			
Baseline	7.09		
Endline	10.28		
Diff (End line – Baseline)	3.19	0.454	7.03***
<b>Diff – in - Diff</b>	<b>0.38</b>	<b>0.641</b>	<b>0.556</b>

**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 Sexual Reproductive Health-related Risks**

Findings in table 5 show average knowledge scores on risks based on assessment done in both the intervention and non-intervention primary schools. There were no statistically significant gains in knowledge on risks registered for boys and girls regardless of their age. However, girls aged 14 years in the intervention and control Schools had significant variations. Those in intervention schools made a significant loss in knowledge on risks with a NIE of -1.56. Similarly, boys and girls in the intervention schools with no mothers made a significant loss in knowledge on children risks with NIE of -2.56 and -2.47 respectively.

On average, boys in the intervention schools whose mothers were medical workers made a significant reduction in knowledge on children risks with a NIE of -3.79. However, boys in the intervention schools whose mothers were peasant farmers, had a significant increase in knowledge on children risks ( $t=2.880$ ;  $p<.05$ ) with a NIE of 1.54. In addition, boys and girls in the intervention schools whose mothers are of other occupations had a decrease in scores with a NIE of -3.26 and -2.41 respectively. On average, boys in the intervention schools whose fathers were teachers and girls whose fathers were medical workers made a significant gain in knowledge on SRH-related risks ( $t=2.868$ ;  $p<.05$ ) and ( $t=1.852$ ;  $p<.05$ ) with a NIE of 2.88 and 1.56 respectively. However, boys in the intervention schools whose fathers were medical workers and those whose fathers were businessmen made a significant loss in knowledge on children risks with a NIE of -3.70 and -1.51 respectively.

Boys in the intervention schools whose parents are not married to each other made a significant loss in knowledge on children risks with a NIE of -1.14. Equally, girls in the intervention schools whose parents were married to each other made a reduction in knowledge on children’s SRH risks with a NIE of -1.12. On average, boys in the intervention day and boarding schools made a significant loss in knowledge on children risks with a NIE



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of -1.54. Relatedly, girls in the intervention day schools made a significant loss in knowledge on children risks with a NIE of -0.77. Girls in the urban-based intervention schools made a significant loss in knowledge on children risks with a NIE of -1.03.

Boys in non-religious affiliated intervention schools made a significant gain in knowledge on children's SRH-related risks ( $t = 2.730$ ;  $p < .05$ ) with a NIE of 2.80. However, there was a decrease in mean knowledge scores among the following; Boys in catholic affiliated intervention schools made a significant loss in knowledge on children risks with a NIE of -1.18, boys in Muslim affiliated intervention schools made a significant loss in knowledge on children risks with a NIE of -1.77, girls in Anglican affiliated intervention schools with a NIE of -1.43, and girls in Muslim affiliated schools with a NIE of -3.93.

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**Table 5. Mean Scores Knowledge of SRH-related Risks in the Intervention and Control Schools at Baseline and Endline by Socio-demographic Characteristics of Children (Maximum Score = 12).**

Variables	Overall (N)	BOYS										GIRLS										
		Comparison			Intervention			NIE	Paired t-test		Comparison			Intervention			Paired t-test					
		BL	EL	D	BL	EL	D		SE	t	BL	EL	D	BL	EL	D	NIE	SE	t			
<b>Age</b>																						
10	153	6.20	5.96	-0.24	9.33	8.70	-	-	0.63	0.39	0.825	-0.473	7.04	7.50	0.46	9.05	9.11	0.06	-	0.40	0.660	-0.606
11	166	6.72	7.48	0.76	10.54	10.71	-	-	0.17	0.59	0.604	-0.977	6.73	7.67	0.94	9.21	9.63	0.42	-	0.52	0.644	-0.807
12	175	7.34	6.93	-0.41	10.20	9.34	-	-	0.86	0.45	0.683	-0.659	6.92	7.79	0.87	8.62	9.33	0.71	-	0.16	0.695	-0.230
13	175	7.78	6.67	-1.11	10.18	9.29	-	-	0.89	0.22	0.625	0.352	7.65	6.40	-	8.40	8.24	-0.16	1.09	0.830	1.313	
14	94	8.00	8.92	0.92	9.86	9.79	-	-	0.07	0.99	0.628	-1.578	8.14	8.89	0.75	8.10	7.29	-0.81	-	1.56	0.903	1.728**
<b>Mother alive</b>																						
Yes	705	7.13	6.89	-0.24	10.00	9.58	-	-	0.42	0.18	0.311	-0.579	7.23	7.64	0.41	8.60	8.71	0.11	-	0.30	0.354	-0.846
No	55	7.22	7.78	0.56	11.00	9.00	-	-	2.00	2.56	0.957	2.675**	4.80	7.15	2.35	9.92	9.80	-0.12	-	2.47	0.864	2.857**
<b>Mother's occupation</b>																						
Peasant Farmer	292	7.04	6.27	-0.77	10.53	9.80	-	-	0.73	0.04	0.448	0.089	7.03	7.45	0.42	8.08	7.84	-0.24	-	0.66	0.658	-1.003
Teacher	71	6.36	7.06	0.70	8.50	8.71	-	-	0.21	0.49	1.503	-0.326	7.33	9.00	1.67	7.86	9.60	1.74	0.07	1.079	0.065	
Medical worker	51	4.63	7.17	2.54	10.75	9.50	-	-	1.25	3.79	0.868	4.365**	8.50	6.40	-	8.83	8.38	-0.45	1.65	1.294	1.275	
Businesswoman	207	8.12	7.68	-0.44	9.00	10.10	-	-	1.10	1.54	0.535	2.880**	6.86	7.28	0.42	9.81	9.70	-0.11	-	0.53	0.530	-1.000
Others	84	8.60	9.33	0.73	10.71	8.18	-	-	2.53	3.26	1.127	2.892**	7.38	10.14	2.76	8.45	8.80	0.35	-	2.41	0.851	2.831**
<b>Father alive</b>																						
Yes	656	7.13	6.78	-0.35	9.97	9.57	-	-	0.40	0.05	0.317	-0.158	7.16	7.54	0.38	8.72	8.73	0.01	-	0.37	0.363	-1.020

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No	111	7.23	8.20	0.97	10.53	9.44	-	-	1.09	2.06	0.853	-2.415	6.79	7.67	0.88	8.94	9.10	0.16	-	0.72	0.815	-0.883
<b>Father's occupation</b>																						
Peasant Farmer	210	7.15	5.92	-1.23	9.78	9.52	-	-	0.26	0.97	0.586	1.657	6.77	7.38	0.61	8.36	8.14	-0.22	-	0.83	0.737	-1.126
Teacher	71	6.93	5.88	-1.05	8.50	10.33	-	-	1.83	2.88	1.004	2.868**	8.00	7.33	-	9.30	9.80	0.50	-	1.17	0.817	1.432
Medical worker	50	7.20	9.40	2.20	10.17	8.67	-	-	1.50	3.70	1.071	3.454**	8.22	6.20	-	10.13	9.67	-0.46	-	1.56	0.842	1.852**
Businessman	195	7.26	7.55	0.29	10.46	9.24	-	-	1.22	1.51	0.588	2.566**	6.78	7.77	0.99	8.00	9.00	1.00	-	0.01	0.735	0.014
Others	129	6.92	7.62	0.70	10.27	9.95	-	-	0.32	1.02	0.722	-1.412	7.39	7.92	0.53	9.28	8.74	-0.54	-	1.07	0.769	-1.391
<b>All parents alive</b>																						
Yes	639	7.05	6.77	-0.28	9.86	9.51	-	-	0.35	0.07	0.332	-0.211	7.08	7.73	0.65	8.64	8.74	0.10	-	0.55	0.371	-1.482
No	128	7.63	8.06	0.43	10.93	9.75	-	-	1.18	1.61	0.644	2.498**	7.24	6.95	-	9.26	9.00	-0.26	-	0.03	0.687	0.044
<b>Parents married</b>																						
Yes	526	6.81	6.42	-0.39	9.88	9.59	-	-	0.29	0.10	0.359	0.279	7.05	7.93	0.88	8.89	8.65	-0.24	-	1.12	0.412	2.716**
No	241	8.07	8.19	0.12	10.50	9.48	-	-	1.02	1.14	0.500	2.280**	7.24	7.00	-	8.49	8.97	0.48	-	0.72	0.566	1.273
<b>Type of school</b>																						
Day	616	7.02	6.74	-0.28	10.00	9.44	-	-	0.56	0.28	0.346	-0.810	6.77	7.39	0.62	8.79	8.64	-0.15	-	0.77	0.389	1.977**
Day and Boarding	151	7.93	9.09	1.16	10.29	9.91	-	-	0.38	1.54	0.479	3.216**	8.58	8.50	-	8.65	9.13	0.48	-	0.56	0.639	0.876
<b>Location of school</b>																						
Urban	373	6.76	6.69	-0.07	9.67	9.52	-	-	0.15	0.08	0.390	-0.205	6.66	7.24	0.58	8.80	8.35	-0.45	-	1.03	0.455	2.263**
Rural	394	7.48	7.28	-0.20	10.37	9.59	-	-	0.78	0.58	0.434	-1.336	7.89	7.95	0.06	8.73	9.10	0.37	-	0.31	0.495	0.627
<b>Religious affiliations of school</b>																						

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Catholics	324	7.22	6.97	-0.25	10.38	8.95	-	-	-	7.74	7.69	-	8.45	9.14	0.69	0.74	0.604	1.225	
Anglican	283	7.14	6.94	-0.20	10.11	9.83	-	-	0.626	1.884**	5.89	7.35	1.46	8.76	8.79	0.03	-	-	
Muslim	108	6.31	7.69	1.38	10.10	9.71	-	-	0.28	0.08	0.456	-0.175	4.50	8.08	3.58	9.00	8.65	-0.35	
None	52	8.00	5.33	-2.67	9.44	9.57	0.39	1.77	0.855	2.070**	8.00	5.00	-	9.75	7.71	-2.04	3.93	1.118	3.515**
							0.13	2.80	1.026	2.730**			3.00			0.96	1.451	0.661	

**NIE = net intervention effect (difference in intervention area from baseline to end line minus difference in comparison area from baseline to end line).**

**Source; Primary data 2018**

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### **3.2.1 Overall Net Intervention Effect for Correct Knowledge of Sexual Reproductive Health Risks**

Overall, there were no significant differences between correct knowledge on risks of children in the intervention and comparison schools. Children from the intervention group exhibited the strongest knowledge growth from baseline to endline as shown in table 6.

**Table 6. Overall Net Intervention effect for Correct Knowledge of SRH Risks**

<b>Variable</b>	<b>Mean</b>	<b>Standard Error</b>	<b> t </b>
<b>Comparison</b>			
Baseline	7.12		
End line	9.31	0.328	6.67***
Diff (End line – Baseline)	2.18		
<b>Intervention</b>			
Baseline	7.22		
End line	9.15	0.328	5.88***
Diff (End line – Baseline)	1.93		
<b>Diff – in - Diff</b>	<b>0.74</b>	<b>0.464</b>	<b>0.55</b>

**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 Children Rights**

Table 7 describes mean scores of children’s knowledge of children rights according to their socio-demographic characteristics. Findings showed that girls aged 11, 12, 13 and 14 years had significant variations. Those in intervention schools made a significant improvement in knowledge on children rights (t=2.804; p<.05), (t=2.511; p<.05), (t=1.807; p<.05), and (t=1.807; p<.05) with a NIE of 1.46, 1.36, 1.02 and 1.68 respectively. Girls in the intervention schools with mothers made a significant increase in knowledge on children rights (t = 3.701; p<.05) with a NIE of 0.93.

On average, boys in the intervention schools whose mothers were businesswomen made a significant improvement in knowledge on children rights (t=2.996; p<.05) with a NIE of 1.16, while boys whose fathers are medical workers made a decrease in mean scores with NIE of -0.67. In contrast, girls in the intervention schools whose mothers were peasant and girls whose mothers were teachers had a significant increase in knowledge on children rights (t = 3.884; p<.05) and (t=3.370; p<.05) with a NIE of 2.19 and 1.41 respectively. Relatedly, girls whose fathers were peasants and girls whose fathers are of other occupations had a significant increase in mean scores with a NIE of 1.17 and 2.01 respectively. On the other hand, girls in the intervention schools whose fathers were peasants made a significant improvement in knowledge on children rights (t=1.920; p<.05) with a NIE of. 1.17.

Girls with both parents alive had a significant increase of knowledge in children rights (t=4.075; p<.05) with a NIE of 1.10. Girls in the intervention schools with fathers made a significant gain in knowledge on children rights (t=4.040; p<.05) with NIE of 1.14 and those without fathers made a significant increase in knowledge on rights (t=1.674; p<.05) with a NIE of 0.88. On average, boys in the intervention schools whose fathers were medical workers made a significant loss in knowledge on children rights with a NIE of -0.87.

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Boys and girls whose parents are married to each other in the intervention schools made a significant increase in knowledge on children rights ( $t=1.762$ ;  $p<.05$ ) and ( $t=4.375$ ;  $p<.05$ ) with a NIE of 0.58 and 1.07 respectively. On average, boys in the intervention day and boarding schools made a significant increase in mean knowledge scores on children rights ( $t=1.722$ ;  $p<.05$ ) with a NIE of 0.63. In addition, girls in the intervention day schools made a significant improvement in knowledge on children rights ( $t=4.218$ ;  $p<.05$ ) with a NIE of 1.29. Likewise, boys and girls in the intervention urban schools made a significant gain in knowledge on children rights ( $t = 1.734$ ;  $p<.05$ ) and ( $t=3.487$ ;  $p<.05$ ) with NIE of 0.62 and 0.96 respectively.

Boys in Anglican affiliated intervention schools made a significant improvement in knowledge on children rights ( $t=2.849$ ;  $p<.05$ ) with a NIE of 1.02 whereas girls in catholic, Muslim, and non-religious affiliated intervention schools made a significant improvement in knowledge on children rights ( $t=3.180$ ;  $p<.05$ ), ( $t=2.078$ ;  $p<.05$ ), ( $t=3.625$ ;  $p<.05$ ) with NIE of 1.22, 2.24 and 3.54 respectively.



**Citation:** Bunoti, S. N; Naitala, R; Bangoza, A; Atuyambe, L & Tumwesigye, N. M. (2022). Evaluation of the Effectiveness of a Rights-based Intervention in enhancing Knowledge of Pubertal Body Changes, Sexual Reproductive Health Risks and Children Rights in Jinja, Uganda: A Randomized Control Trial. *Journal of Popular Education in Africa*. 6(4), 4 – 13.

**Table 7. Mean Scores on Knowledge of Children Rights in the Intervention and Control Schools at Baseline and Endline by Socio-demographic Characteristics of Children (Maximum Score = 10).**

Variables	Overall (N)	BOYS									GIRLS									
		Comparison (Mean)			Intervention (Mean)			Paired t-test			Comparison (Mean)			Intervention (Mean)			Paired t-test			
		BL	EL	D	BL	EL	D	NIE	SE	t	BL	EL	D	BL	EL	D	NIE	SE	t	
<b>Age</b>																				
10	153	8.00	7.79	-	8.00	8.80	0.80	1.01	0.886	1.141	8.46	8.60	0.14	8.64	8.72	-	0.06	0.530	-0.113	
11	166	8.36	8.09	-	9.77	10.00	0.23	0.50	0.466	1.072	8.46	7.56	-	8.88	9.44	0.56	1.46	0.521	2.804**	
12	175	6.76	6.67	-	9.70	9.78	0.08	0.17	0.539	0.315	8.54	7.21	-	9.35	9.38	0.03	1.36	0.542	2.511**	
13	175	7.04	6.89	-	9.35	9.00	-	-	0.610	-0.328	8.41	7.27	-	9.55	9.43	-	1.02	0.564	1.807**	
14	94	7.90	7.38	-	9.64	9.71	0.07	0.59	0.686	0.860	7.71	6.00	-	9.60	9.57	-	0.03	1.68	0.886	1.896**
<b>Mother alive</b>																				
Yes	705	7.58	7.34	-	9.37	9.56	0.19	0.43	0.281	1.532	8.62	7.74	-	9.23	9.28	0.05	0.93	0.251	3.701**	
No	55	7.00	7.00	0.00	9.83	9.67	-	-	0.856	-0.187	4.60	6.15	1.55	8.50	9.60	-	1.10	0.45	1.137	-0.396
<b>Mother's occupation</b>																				
Peasant Farmer	292	6.25	6.07	-	9.56	9.47	0.09	0.09	0.429	0.210	7.77	5.79	-	8.88	9.09	0.21	2.19	0.564	3.884**	
Teacher	71	8.91	8.28	-	10.00	9.86	0.14	0.49	0.524	0.935	9.17	8.50	-	8.86	9.60	0.74	1.41	0.418	3.370**	
Medical worker	51	8.50	8.33	-	10.00	10.00	0.00	0.17	0.965	0.176	8.80	9.20	0.40	10.00	9.50	-	-	0.531	-1.694	
Businesswoman	207	8.88	8.79	-	8.86	9.93	1.07	1.16	0.387	2.996**	9.00	9.22	0.22	9.71	9.55	-	-	0.244	-1.556	
Others	84	9.20	9.33	0.13	9.57	8.45	-	-	0.676	1.848**	9.00	7.57	-	9.25	9.00	0.25	1.18	0.609	1.939**	
<b>Father alive</b>																				
Yes	656	7.43	7.27	-	9.33	9.52	0.19	0.35	0.297	1.179	8.41	7.43	-	9.12	9.28	0.16	1.14	0.282	4.040**	
No	111	8.31	7.60	-	9.73	9.89	0.16	0.87	0.601	1.449	8.50	7.83	-	9.29	9.50	0.21	0.88	0.526	1.674**	

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				0.71								0.67								
<b>Father's occupation</b>																				
Peasant Farmer	210	6.22	6.26	0.04	8.56	9.23	0.67	0.63	0.624	1.010	7.19	6.14	-	9.14	9.26	0.12	1.17	0.610	1.920**	
Teacher	71	8.07	7.35	-	9.83	10.00	0.17	0.89	0.663	1.342	9.50	9.67	0.17	9.40	9.30	-	-	0.445	-0.607	
Medical worker	50	9.60	9.80	0.20	10.00	9.33	-	-	-	-	8.11	8.40	0.29	8.75	9.67	0.92	0.63	0.744	0.847	
Businessman	195	7.77	7.90	0.13	9.38	9.82	0.44	0.31	0.414	0.749	8.67	7.80	-	8.89	8.53	-	0.36	0.51	0.544	0.937
Others	129	7.46	7.62	0.16	9.73	9.67	0.06	0.22	0.704	-0.313	9.44	7.67	-	9.44	9.68	0.24	2.01	0.478	4.202**	
<b>Both parents alive</b>																				
Yes	639	7.43	7.21	-	9.28	9.49	0.21	0.43	0.302	1.423	8.53	7.63	-	9.08	9.28	0.20	1.10	0.270	4.075**	
No	128	8.13	7.94	-	9.93	9.88	-	0.14	0.582	0.240	7.88	7.05	-	9.42	9.44	0.02	0.85	0.650	1.307	
<b>Parents married</b>																				
Yes	526	7.47	7.08	-	9.27	9.46	0.19	0.58	0.329	1.762**	8.48	7.38	-	8.96	9.26	0.30	1.40	0.320	4.375**	
No	241	7.71	7.83	0.12	9.71	9.86	0.15	0.03	0.451	0.066	8.28	7.71	-	9.51	9.36	-	0.15	0.42	0.405	1.037
<b>Type of school</b>																				
Day	616	7.27	7.19	-	9.27	9.56	0.29	0.37	0.308	1.199	8.27	7.18	-	8.98	9.18	0.20	1.29	0.306	4.218**	
Day and Boarding	151	9.29	8.45	-	9.76	9.55	-	0.63	0.366	1.722**	9.11	9.29	0.18	9.65	9.63	-	-	0.207	-0.966	
<b>Location of school</b>																				
Urban	373	7.96	7.98	0.02	8.97	9.61	0.64	0.62	0.358	1.734**	8.92	8.41	-	8.85	9.30	0.45	0.96	0.275	3.487**	
Rural	394	7.14	6.50	-	9.72	9.53	-	0.45	0.408	1.102	7.54	6.44	-	9.34	9.30	-	0.04	1.06	0.474	2.239
<b>Religious affiliations of school</b>																				
Catholics	324	7.52	6.95	-	9.81	8.91	-	-	0.476	-0.694	8.13	7.33	-	9.03	9.45	0.42	1.22	0.384	3.180**	

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Anglican		9.00	8.65	-	9.11	9.78					8.76	8.23	-	9.42	9.34	-			
	283			0.35			0.67	1.02	0.358	2.849**			0.53			0.08	0.45	0.306	1.472
Muslim		5.69	6.08		9.60	9.79		-			8.75	6.00	-	9.27	8.76	-			
	108			0.39			0.19	0.20	0.803	-0.249			2.75			0.51	2.24	1.078	2.078**
None		7.50	6.33	-	9.78	9.86					9.43	9.50	0.07	6.25	9.85				
	52			1.17			0.08	1.25	1.047	1.194						3.60	3.53	0.974	3.625**

**D = Mean difference, SE = standard error, NIE = net intervention effect (difference in intervention area from baseline to end line minus difference in comparison area from baseline to end line).**

**Source; Primary data**

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### **3.3.1 Overall Net Intervention Effect for Correct Knowledge on Children's Rights**

There were significant differences between correct knowledge on children rights of children in the intervention and comparison schools in the overall. Children from the intervention group exhibited the strongest knowledge growth from baseline to end line as illustrated in table 8.

**Table 8. Overall net intervention effect for correct knowledge on children rights**

<b>Variable</b>	<b>Mean</b>	<b>Standard Error</b>	<b> t </b>
<b>Comparison</b>			
Baseline	7.97		
End line	9.26	0.276	4.67***
Diff (End line – Baseline)	1.29		
<b>Intervention</b>			
Baseline	7.40		
End line	9.43	0.277	7.32**
Diff (End line – Baseline)	2.03		
<b>Diff – in - Diff</b>	<b>0.74</b>	<b>0.391</b>	<b>1.88*</b>

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

**Source: Primary data 2018**

## **4.0 Discussion**

A baseline survey was conducted in 16 primary schools to establish knowledge of pubertal body changes, SRH risk factors and children's SRH rights among primary school children aged 10-14 years in Jinja District, and an intervention was developed to address the identified knowledge gaps and enhance children's SRH knowledge. The 16 schools were randomly divided into 8 intervention and 8 control schools. A two-day teacher training program on the implementation of the intervention was conducted among sixteen teachers from eight intervention schools. After 6 weeks of its implementation an endline survey was conducted in both intervention and control schools to evaluate the effectiveness of the intervention. The endline results showed an increase in knowledge in the three areas namely, pubertal body changes, SRH risk factors, and children's SRH rights.

### **4.1 Knowledge of Pubertal Body changes**

The endline results of our study found an increased awareness of pubertal body changes among boys aged 10-11 years in the intervention schools. This is in line with a study conducted by Yazici, Seyis, & Altum (2011) who found that majority of the children who participated in their study were aware of pubertal changes in their own bodies. This is probably because ages between 10 and 14 is a period of great change for children as they start to discover the world around them. It is also the time when children's vision of their own environment and cultures of others begin to take shape (Santrock, 2006). On the other hand, there was a decrease in knowledge on pubertal changes among boys aged 14 years as compared to girls. This decrease is attributed to the fact that the pubertal process is early in girls compared to boys (NHS, 2018; PAHO, 2001).

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Our Endline results also showed that girls in intervention schools who were entirely orphans registered a significant improvement in knowledge on pubertal body changes, implying that girls with no mothers are more likely to spend most of their time with their fathers who probably do not know much about pubertal issues concerning girls. Besides, some cultures do not allow fathers to talk to their daughters about puberty (Wamoyi, Fenwick, Urassa, Zaba, & Stones, 2010). Such orphaned children could as well be forced to stay with their step mothers who may not bother to teach them about pubertal body changes.

In regard to parent's occupation, our endline results showed that children in intervention schools whose parents were peasants and business persons made a significant improvement in knowledge on pubertal body changes as compared to children whose parents were teachers and medical workers. Parents who are peasants are believed to have quality time spent with their children. That is, farmers and business persons are more likely to have enough time with their children as compared to teachers and medical workers who may have limited time with their children. According to Hirschi (2009), the occupation of parents plays a significant role in influencing the child's knowledge of pubertal changes. Sometimes, being a parent and being a healthcare worker are situations that could be stressful (Cakmak & Oztürk, 2021) a situation that may prevent such individuals from interacting with their children. Especially, more of the full-time working mothers spend too little time with their children (Pew Research Center, 2015).

In terms of school type, girls in the intervention day and boarding schools made a significant improvement in knowledge on pubertal changes compared to boys, an indication that boys and girls experience puberty differently. On the other hand, girls in rural-based intervention schools made a reduction in knowledge on pubertal body changes. This is perhaps due to limited access to information in rural areas compared to those with access in urban areas. Nevertheless, the United Nations Convention on the Rights of the Child (UNCRC) states that every child has the right to reliable information from a variety of sources, and governments should encourage the media to provide information that children can understand (United Nations, 1989). It is therefore the role of governments to help and protect children from IEC materials that could misinform them in one way or another. Relatedly, the problem of bad roads in rural areas hinders accessibility of schools by career guidance providers to increase pubertal awareness.

A study by de-Armas and colleagues (2022) showed that accessibility to schools influences provision of services as education is proved to be fundamental in one's development and growth. One relevant issue with respect to access to education is the availability of schools within a reasonable distance. Equally, Jain and colleagues (2017) also found increased awareness about pubertal changes among urban adolescent girls than in rural adolescent girls.

Religion plays a significant role in shaping the values of any child and has been found to instil morals and ethical values that help to restrain behaviours of teenagers (Eggebeen & Dew, 2009). This is probably why girls in catholic affiliated intervention schools of this study made a significant improvement in knowledge on pubertal body changes. Most times, girls/women are considered to be disciplined as a result of attending church services compared to boys/men. However, while studying Church Discipline and the Control of the Public Practice of Religion in the Calvinist Diocese of Küküllő, Kiss (2013) found out that women do not want to go to church. They are more likely to acquire knowledge of pubertal changes from the teachings of the church leaders as compared to boys. Contrariwise, Ndayishimiye and colleagues (2020) assert that some

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religious leaders and family members may hinder adolescents from health-seeking behavior, a scenario that may lead to limited pubertal knowledge in some areas.

#### **4.2 Knowledge of SRH risk factors**

At the evaluation of the effectiveness of our intervention to enhance SRH knowledge factors, findings demonstrated that boys in the intervention schools exhibited increased awareness of risky behaviour that threaten their pubertal stage. Reported risky behaviours included disrespect, drug and substance abuse, engaging in aggressive activities, getting attracted to opposite sex and getting involved in other dubious behaviours among others. Boys in the intervention schools whose mothers were peasants had a significant increase in knowledge on SRH-related risks compared to girls. Consistent with our findings, Ochen and colleagues (2019) found that the prevalence of teenage pregnancy was higher among girls whose parents were employed as peasant farmers than those in formal employment and businesses. Contrary to our findings, a recent study conducted in Jinja found lack of knowledge on how to avoid early pregnancies among adolescent girls (Nabugoomu et al., 2020).

As far as religion is concerned, boys in non-religious affiliated intervention schools made a significant gain in knowledge on children's SRH-related risks. Our study established that interventions in schools generally significantly improve the children's knowledge of SRH-related risks. A similar study conducted in Uganda found greater improvements in SRH knowledge among intervention schools (Kemigisha et al., 2019). These interventions therefore further build a strong support system for parents, teachers and religious leaders to help adolescents navigate through their puberty successfully.

#### **4.3 Knowledge of Children's SRH Rights**

Considering children's knowledge of their SRH rights, this study found that girls in intervention schools made a significant improvement in knowledge on children rights. Unlike boys, the girl child has received a lot of attention in regard to their rights, sexual abuse and equality; and probably this makes them acquire more knowledge about children's rights than their counterparts. Whereas children are gendered human beings; and boys and girls have specific experiences and needs, girls in particular are more likely to be confronted with sexual violence (COE, 2022). Largely, girls think they have more knowledge of child rights than boys (Stamatović & Cicvarić, 2019).

Results of this study indicated an effect of parents' marital status on children's knowledge of SRH rights. Findings of our study showed a significant increase in knowledge on children rights among boys and girls in the intervention schools whose parents are married to each other. These findings reflect the combined efforts parents in relation to creating children-rights awareness among their children. Our findings are in agreement with Darling-Hammond and colleagues who found that school children were aware of their right to be happy, right to be treated with compassion, right to be who they want to be, and right to be safe in school among others (Darling-Hammond, Flook, Cook-Harvey, Barron, & Osher, 2020). The increased knowledge among children with both parents married to each other could be attributed to care, love and time given to them by both parents. One study conducted in Nepal showed that children with parents who loved each other stayed in school longer (Coulson, 2020). Broadly, this means



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that children with lovely parents are likely to score high when it comes to children's right to education.

As regards parents' occupation, boys in the intervention schools whose mothers were businesswomen made a significant improvement in knowledge on children rights. Relatedly, girls in intervention schools whose mothers were peasants or teachers had a significant increase in knowledge on children rights. In the same way, girls whose fathers were peasants or of other occupations had a significant increase in knowledge of children rights. Our findings imply that parent's occupation has nothing to do with children's knowledge of their rights, except, there could be other underlying factors. For instance, research has revealed that not only socio-economic factors are important in conditioning parent's attitudes and behaviors towards children's rights, but also parent's awareness and understanding of these rights (Voicu, Anghel, & Savu-Cristescu, 2015), teachers' efforts to provide them with information on child rights (Stamatović & Cicvarić, 2019). On the other hand, irrespective of one's occupation, parents have responsibilities related to their children's school and education (Kiral, 2019).

In view of the school location, boys and girls in the intervention-urban schools made a significant gain in knowledge on children rights. These findings imply that intervention schools built capacity of learners in regard to identifying with their rights and responsibilities. However, a similar study conducted in rural and urban areas of Mexico found that a higher percentage of parents in rural areas feel comfortable caring for their children (Echeverría-Castro, Sandoval-Domínguez, Sotelo-Castillo, Barrera-Hernández, & Ramos-Estrada, 2020), literally meaning that they have time to teach them about their rights. Possibly, intervention information packages through the routine training, the role of senior teachers and other support staff played a significant role in improving awareness of children rights.

As a result of the intervention, there was also a significant improvement in knowledge on children rights among girls in Catholic, Muslim, and non-religious affiliated intervention schools compared to boys. Nonetheless, boys in Anglican-affiliated intervention schools made a significant improvement in knowledge on children rights. However, many contributions of religious groups to the realization of children's rights and well-being are not always well-known among child-rights advocates (Arigatou International, 2019). Therefore, efforts towards increased awareness of children rights in primary schools should mostly target schools with religious affiliations. Additionally, reflection and dialogue within and among religious groups, continued study and interpretation of sacred texts, are needed in order to understand the application of children's rights in the context of religious teachings (Arigatou International, 2019). Besides, school is the most suitable place for students to learn about child rights and where these rights are to be respected (Stamatović & Cicvarić, 2019).

#### **4.1 Methodological Challenges**

Like other studies, this study met a number of challenges including children's failure to complete the questionnaire, and hence, some action was taken to ensure data quality. Teachers and research assistants were trained and given detailed explanation about our study and techniques to apply while collecting data from children.

It should be noted that each region in Uganda is quite unique in terms of culture. This study was limited to Jinja District which is located in the eastern part of Uganda. The culture in

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eastern Uganda, might have played a significant influence on the way children responded to questions related pubertal body changes.

Data was collected from primary school children once (cross-sectional). This might have led our team to leave behind information from those who were not around during data collection period. Therefore, a longitudinal study in a number of regions is recommended.

Also, endline data was collected at a time when schools were preparing children for the end of year examinations. This affected children's concentration and time given to respond to the questionnaire. We recommend that conducting similar studies in schools at the end of the academic year should be avoided.

#### **4.2 Recommendations**

Increasing levels of engaging parents, caretakers and guardians in the right-based approach is highly recommended. This will help in equipping children with relevant knowledge on the pubertal changes, SRH-related risks and children's rights.

There is a need to scale up interventions in more schools especially rural schools since intervention-based schools continued to show an increase in the level of awareness of the pubertal changes, child rights and SRH risks by children.

There is need to adopt the different interventions to meet the needs of the varying religious beliefs and values. Putting this in consideration will help reverse the negative Net Intervention Effects (NIE) in some religious-affiliated schools.

The findings of this study call upon efforts to empower more adolescents especially girls attending school and in their communities through such interventions to increase their awareness which may in turn lower cases of school drop outs, abuse and manipulation among others.

#### **5.0 Conclusion**

Our study found an increase in knowledge of physical changes, SRH-related risks and rights among children in the intervention schools. In line with the Theory of Change (ToC), our findings have indicated that the intervention was effective for learning about pubertal body changes, SRH risk factors and children's SRH rights. For instance, children whose parents were peasants saw the intervention as an opportunity unlike those whose parents were in professional jobs. Children from catholic affiliated schools benefited most from the intervention as catholic affiliated schools are known to put emphasis on aspects of discipline and not merely academics. Personal experiences influence the boys' and girls' awareness of pubertal changes.

#### **5.1 Policy Implications**

Our study is among a few interventional studies conducted in Uganda to evaluate the effectiveness of a rights-based intervention among primary schools. The study findings render support to the education system to consider designing and implementing of school-based pubertal information interventions to primary school children in both rural and urban Uganda, but with more emphasis for rural children. This is because rural schools are generally known for early marriages, teenage pregnancies, poor menstrual hygiene, and poor management of other pubertal changes. To this effect, Uganda's National Curriculum Development Centre (NCDC) vetted the intervention curriculum and recommended that two separate books be developed: - Children's Resource Book and a Teacher's Practical Guidelines. After rigorous reviews, the two

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books were approved 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, because schools are best places to nurture young and developing minds of adolescents. To reduce inequality between rural and urban setups in regard to menstrual hygiene management, primary schools in similar contexts ought to avail pubertal information and menstrual hygiene materials to rural schools so as to bring them to the same level as urban schools.

### **Authors' Contributions**

SBN designed the study, supervised data collection, analysed and interpreted the data, and drafted the first manuscript; RN analysed the data, AB, LN and NMT supervised study designing, data collection and analysis, revised and approved the manuscript.

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