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## Peer Reproductive Health Education Trial in Eritrea

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### Abstract

Reproductive health is a state of physical, mental and social well-being in all matters relating to the reproductive system at all stages of life. In East Africa including Eritrea, adolescents comprise more than a quarter of the population. The region holds the highest rates of sexually transmitted diseases, HIV, unwanted pregnancy and unsafe abortion and its complications among young girls. The study aimed to test the effectiveness of peer reproductive health education in improving knowledge, attitude, and health service use of high school adolescent girls in Zoba Debub Eritrea. Community-based, randomized, controlled pretest/posttest intervention study was designed in this research. Zoba Debub (southern state) was randomly selected out of the six zobas in Eritrea. The four high schools out of the 26 in Zoba Debub were randomly selected and assigned one intervention and three controls as study target schools. The target population was randomly selected female students attending grade nine. The protocol was reviewed and approved by the Scientific and Ethics Committees. Consent of the study participants was obtained.

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Data was collected using predesigned and pretested questionnaire emphasizing on reproductive health knowledge, attitude and practice. Sample size was calculated using proportion formula ( $\alpha$  0.01, power of 95%, & effect size of 20%). Measures used were scores and proportions. Descriptive and inferential statistics t-test and chi square at ( $\alpha$  .01), 99% confidence interval were used to compare changes of pre and post-intervention scores using SPSS soft ware. Seventeen students were selected for peer educators and trained.

The results show that Six hundred twenty seven (627) students (164 in intervention and 463 in the control group} with a ratio of 1 to 3, were enrolled in the study. The mean age for the total study population was  $15.4 \pm 1.0$  years. Reproductive knowledge scores which was calculated out of a total 61 grade points: intervention group (pretest 6.7%, post-test 33.6%;  $p= 0.0001$ ); control group (pretest 7.3%, posttest 7.3%,  $p= 0.92$ ). Proportion difference in attitude: intervention group (pretest 42.3% post test 54.7%  $p= 0.001$ ); controls group (pretest 45%, post test 44.8  $p= 0.7$ ). Proportion in Practice: intervention group (pretest 15.4%, post test 80.4%  $p= 0.0001$ ); control group (pretest 16.8%, posttest 16.9%  $p= 0.8$ ). Reproductive health knowledge and use of health facilities was poor among adolescent girls in Eretria but significantly increased after intervention. School-based peer reproductive health education is effective and is the best strategy to improve reproductive health knowledge and attitudes.

**Keywords:** Reproductive health; Adolescent girls; Eretria.

## 1. Introduction

Reproductive health (RH) is a state of physical, mental, and social well-being in all matters relating to the reproductive system, at all stages of life. Adolescents comprise larger population group more than ever before in history, yet, their vulnerabilities and needs often remain unaddressed [1]. Adolescence is the age between 10 to 19 years. It is a period of rapid physiological, emotional, social and psychological changes marked by increased exposure and experimentation of, use of tobacco, alcohol and other drugs, along with sexual activity [2]. Moreover penetration of international mass media, weakens conservative social values and arouses adolescent girls' sexual feeling while they are not prepared to handle any risk [3,4].

Indeed adolescent girls in East Africa (EA) including Eritrea lack RH services, RH knowledge and skills to protect themselves and are carrying the worlds' highest burden of RH problems [1,5,6,8,9,10]. The major RH problems affecting young girls in EA include, low use of family planning, early unsafe sexual intercourse, unplanned pregnancy, unsafe abortion and its complication, and highest rates of sexually transmitted diseases and HIV [11,12]. Moreover HIV prevalence in SSA among women is four times more than in men [13,14]. In spite of under reporting, induced unsafe abortion among adolescents remain highest in East Africa with 38 per 1000, holding 40% of world's unsafe abortions [15,16,17,18,19,20,21], Similar to other countries in EA including Eritrea, abortion is the major cause of obstetric complication [22, 23, 6, 24, 9,25]. Thus adolescent girls in Eritrea like their counterparts in EA are facing life challenges in a vacuum and remain captured in a cycle of poverty and impoverishment. Therefore preparing these young people for the transition to adulthood, a time when sexuality and relationships are central, is a challenge. Indeed the need of promoting adolescent reproductive health (ARH) through creating a safe environment, integral sexual education and services and

equipping adolescents with correct RH information and skills has been recognized as a priority public health issue since the International Conference on Population Development[26].

Even though Eritrea has made tremendous improvements in most of its national health indicators and is a signatory for all international conventions to promote ARH, much has not been done on it. In fact the main emphasis in the RH documents of Ministry of Health Eritrea (MoHE) is the reduction of maternal mortality related to childbirth and strengthening emergency obstetric care [27, 23]. In the year 2012 the MoHE has adopted a youth development policy and much has not been done on ARH [28]. Overall all national RH reports are information related to married women [29] . Besides the national health data is not disaggregated by age that makes getting information related to adolescent health impossible [23]. Furthermore the donor driven HIV prevention projects, didn't sustain and there is no documented information on impact evaluation. A study on adolescents' health needs in Eritrea reported, adolescents lack correct RH information and thirst for correct RH information [6]. Thus educating and equipping adolescent girls in Eritrea with correct RH information using the best suitable strategy is timely.

Evidence from around the world had proved, adolescents feel more comfortable to discuss reproductive health issues with their peers and seek RH information and help from peers. Thus peer education strategy is the best approach to teach RH issues to adolescents [30,31] Peer education (PE) is described as “ a range of strategies where people from a similar age group, background, culture and/or social status educate and inform each other creating an environment where young people feel safe and able to share information, skills and values ” [32]. Young people appreciate and are influenced in positive ways by a peer-led intervention provided it is well-designed and properly supervised [1]. It is reported from 34 studies conducted in Sub-Saharan Africa, Latin America, Asia, the pacific and former Soviet Union that peer-led RH interventions are able to reach large number of youth, and were found to be effective in connecting youth to services, increased knowledge, and changed behavior that reduced risky action associated with sexual activity [33]. More over from his review of 83 articles from developed and developing countries Kirby reported, peer reproductive health education is effective and has improved health of adolescents [30]. To be effective, PE program needs careful; planning, training and implementation. Indeed five training challenges identified by [32] include: “Building skills and self-confidence; Creating peers as role models; Keeping peer educators focused and motivated; Ensuring peer educators achieve program goals; Developing infrastructure support”. Moreover big international organizations [32], who supported PE programs worldwide stressed, successful peer education programs require intensive planning, coordination, supervision and resources.

Thus based on the magnitude of the problem and the above mentioned evidence of peer education the researcher tested the efficacy of peer led RH health intervention among adolescent girls in Eritrea.

## **2. Methods and procedures**

This study was preceded by pilot study that assessed the burden of RH illiteracy on adolescent high school girls in Eritrea that revealed young girls lack RH knowledge, have poor attitude towards RH and never used the available RH services for any RH purpose and high prevalence of unplanned pregnancy.

## **2.1 Research Design**

Community based randomized, case controlled pretest posttest educational intervention study. The intervention group have received the Peer Reproductive Health Education Program for two month, while nothing was done on the controls. Focus group discussion (FGD) and in-depth interviews were conducted to generate qualitative data to have a deeper understanding of the problem understudy and intervention process and outcome.

## **2.2. Study Area**

Four high Schools in Zoba Dehub (ZD)

ZD is one of the six Zobas (Regions) of Eritrea which is located in the southern part of the country with longitude of 38° 15' - 39° 40' East and latitude 14° 25' - 15° 15 North. It has an area of 10,000 square kilometers. It contains 997 villages, 8 cities, 10 towns, 232 administrative Kebabis, a population size of 762,432 people, and 175,030 families. Seventy five percent of its people live on farming, 25% trade, and civil servants. In ZD 46% of the population are between the age groups of 6-18 years. Ethnic composition in ZD is, Tigrigna 91.1%, Saho 7.6%, Tigre 1.2% others 0.1%. [34]. The Climate include dega (highlands), weinadega (middle lands), kola (low lands). ZD is the center of ancient civilization evidenced by an ancient archeological findings such as Belew Kelew that relates to the ancient Axumite Kingdom (ended in 700 AD) and many others. The existing customary and religious laws are the evidence of its ancient civilization [34] . At present ZD has 65 health facilities, 5 (five) hospitals, 11(eleven) health centers, 47 health stations, 2 MCH centers [23]. Schools in ZD include: 242 elementary, 87 junior and 26 secondary, schools [35]. Elementary and junior schools are very accessible to the population. In Eritrea 70% of boys and girls aged 10 to 14 attend school and 66% of female population who should be enrolled in grade nine are attending in grade nine [35, 36].

## **2.3. The target schools**

The target schools are public school having the same curriculum, similar qualification of teachers who follow guidelines of the Ministry of Education and having homogenous students. One high school serves one subzone having distant villages in their catchment in which students walk to school. The infrastructure in the target school is fairly good. Student girls in these schools walk long distance, use cycle, some rent houses near the school living alone or in groups.

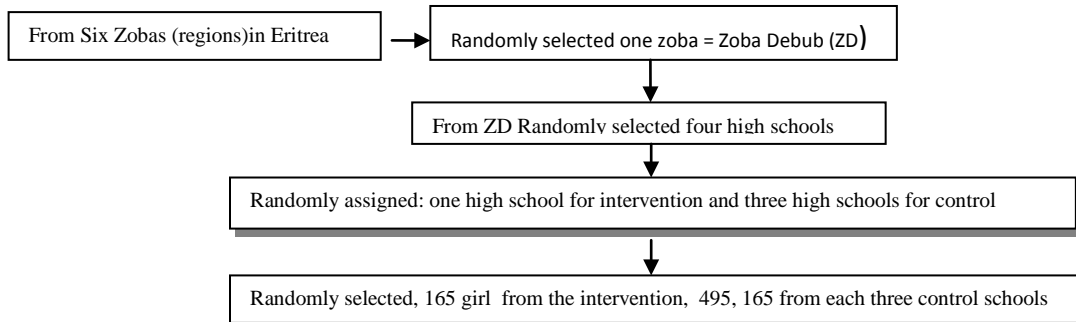
## **2.4. Population**

Female only, because adolescent girls are the most vulnerable segment of the population. Most importantly females in Eritrea are traditionally shy and they will never discuss RH issues openly among boys. Moreover the grade nine students have more years to stay in the school that will make longer follow up possible. Furthermore UNICEF recommends, reproductive health education should be introduced to adolescents before the initiation of sexual activity.

## 2.5. Sampling

A Multi- stage- random sampling method is utilized. (Zoba - School – students)

### Sampling Frame Model



Inclusion criteria: Public high schools in ZD; Grade nine students, Girls only

### 2.5.1. Sample size

For sample size estimation, equation for proportion was used. The RH knowledge was 30% (from pilot study) and it was assumed, there will be 20% increase after intervention (50%). Sample size was calculated using proportion of 20%, Power of 95% and alpha 0.01. Thus the sample size was 165 intervention and 495 in the control group a total of 660 students (proportion of 1for 3)

## 2.6. Variables

**Independent Variable:** the Reproductive Health Education. **Dependent variable:** Reproductive health Knowledge, attitude, and Health service use. **Covariates:** age, socioeconomic status

## 2.7. Measures

Scores were used to measure knowledge, and proportions for attitudes & health service use.

## 2.8. Data collection tools and techniques:

**The Questionnaire:** was self developed in reference to related original research articles, WHO- UNFPA documents, and in consultation with Public Health experts at the MoHE. The questionnaire captured, Demographic data of students and their family back ground; the reproductive health knowledge, attitude towards RH practices, and health service use

Qualitative data: Focus Group Discussion (FGD) and in-depth individual interview was collected using a predesigned discussion guide to complement the quantitative data.

**Data Collection:** Both quantitative and qualitative data was collected in Pre and post intervention periods. Prior to data collection the schools were visited, dates for data collection set and two facilitators were identified from each school. Data collectors were trained for two days. Questionnaire was Pilot tested. Following the pilot test a one day discussion was conducted on the questionnaire and necessary amendments was done. Quality of data was controlled assessing every questioner for completeness when receiving from the respondents.

The FGD was done with two groups from control (female only), 3 groups from intervention (two FGD with the RH education recipients and one FGD with peer educators) all females, and one FGD with teachers from the intervention school composed of male and female teachers).

### ***2.9. Data Processing and analysis***

Data were coded, edited and entered, cleaned for inconsistencies and analyzed using Statistical Package for Social Sciences (SPSS). Descriptive analysis was done for the socio-economic variables. Moreover, to determine the differences, Pretest and Posttest comparison was done on data related to knowledge on reproductive health, health service and practice and attitude of the study participants.

The responses that address the knowledge related questions were given a score ranging from 0(zero) to 10(ten)with a total expected score of 61(sixty one). Mean scores along with 99% Confidence Interval in pretest and posttest for both groups was calculated and t-test was used to determine if there was a statistically significant difference. The questions related to health service and attitude were categorical, proportions were calculated and Chi-square test was used to determine if there was statistically significant difference among the two groups. In both tests, the level of significance, alpha ( $\alpha$ ), was set at 0 .01.

Age and maternal education were considered as a covariate for any effect on the dependent variables

### ***2.10. Ethical Consideration***

Research protocol was approved by the ethical and scientific research committees of the Faculty of Nursing Sciences at University of Khartoum. Permission was secured from the Board of higher education Eritrea, Ministries of Education and Health in Eritrea.

The Study participants were asked for their written consent after explaining the objective of the study and participation was voluntary. For the intervention group the school took the responsibility to inform the families of those under age. Confidentiality was maintained throughout the research process

### ***2.11. Description of the intervention (health education strategy)***

**Selection:** selection of peer educators was done after the intervention groups were selected and before the collection of baseline data. The school director and the program facilitator identified 17 students for peer educators one to facilitate RH discussion for one group of 9-10 students. They were asked for their permission to be peer. The RH education recipients (the intervention group) also agreed with the selection of the peer

educators. The criteria for selection were their acceptance by their peers, their academic performance, regular class attendance and their personal behavior, which all are important characteristics to role model others.

### ***2.11.1 The Reproductive Health Education Curriculum***

The researcher as reproductive health expert and wealth experience on curriculum development designed the curriculum in reference to UNFPA peer education tool kit, the European AIDS peer education UNICEF and WHO documents.

Contents in the curriculum: Module I: communication and teaching methods; Module II: Human RH anatomy and physiology; Module III: developmental changes during adolescence; Module IV: Pregnancy, unsafe abortion and contraception; Module V: Sexually transmitted diseases. The curriculum with its detailed syllabus was approved by the UoK proposal approval panels.

Every Peer Educator was handed, one curriculum, syllabus and handout for a reference.

Illustrated summary of every Module was summarized as a handout and everyone in the intervention group was given one each.

### ***2.11.2 Training of Trainers (ToT) of peer educators***

The training was conducted for fifteen days. Participatory self directed teaching and learning method was used throughout the intervention process. After orientation and self introduction, ground rules was set, four working groups were created. Each group elected a facilitator and a reporter. Each group took an assignment for presentation. The presentation was prepared in reference to their experience and observation, and their handouts. All modules were covered in depth. Every morning evaluation and summary of the preceding day was discussed in a question and discussion form. Then presentation of new topic of the group followed. Finally the trainer used to summarize the module focusing on important take home messages.

In the last two days of the training basic teaching methods were covered which mainly focused on facilitation skills and guiding a discussion.

### ***2.11.3 Peer Led RH Education (one peer educator led a group of 9-10 students)***

During the ToT, at the end of every session the peer educators were exercising the discussion with their groups. This gave both peer educators and the trainer to resolve arising doubts about the content and gave good opportunity for peer educators to share experience and help each other. The peer educators arranged their discussion time in their groups and have started their discussion immediately at the end of the ToT. The director of the school arranged that classes are opened for them early in the morning before the start of class sessions. Majority of the groups conducted their discussion daily Monday through Friday 7 to 8 am. In addition they used the break time to cover what was left uncovered. For those girls coming from far places convenient time was arranged. The intervention took place from mid March through first week of June 2014.

#### **2.11.4 Evaluation of RH education intervention**

Both formative and summative evaluation was done

**Process evaluation:** The school director and the facilitator followed and supported the peer educators. The peer educators had weekly meeting to share their experiences, discuss difficult question they faced during their discussion in their groups which helped them in solving minor problems. The principal researcher was meeting peer educators every two weeks. During this time, problems in the delivery of topics, difficult questions were discussed, problems were raised and solution proposed. One day refresher training was given to the peer educators.

**Summative evaluation:** finally the effectiveness of the intervention was conducted in the first week of June 2014. Using the same data collectors of the pretest, post test data was collected using the same questionnaire that was used to collect the baseline data (pretest). FGD and individual interviews also supplemented the quantitative data

### **3. Results**

#### **3.1 Socio-demographic back ground of study participants**

Socio-demographic characteristics of the study population are presented in table 1. a total of 627 students, 164 in intervention and 627 in the control group with a proportion of 1-3 participated in the study. Mean age for the total study population is 15.35 years ( $\pm 1.0$ ); Intervention group mean age of 15.32 years ( $\pm 1.0$ ); control group mean age of 15.39 ( $\pm 1.0$ ). Mean age for both groups was not significantly different using t-test ( $p= 0.421$ ). Moreover 82% of study participants in both groups are between the ages of 14 and 16 years. Majority (over 90%) are Tigrigna Ethnic group.. Mothers of study participants have very low educational level, that is (67%) below elementary. Majority live with both parents. Thus majority of the participant both in intervention and control groups are homogenous. In supplement of the above figures over 90% of female FGD discussants said “because we are friends and similar in everything our discussions were open and free”.

#### **3.2. Knowledge**

The distribution of RH knowledge score of adolescents at pretest and post-test is presented in table 3 presents. The changes in knowledge scores were significantly higher in intervention group in comparison to the controls. The RH knowledge scores among intervention were (pretest 6.66, post-test 33.6,  $p= 0.0001^*$ ); while in the control (pretest 7.29, posttest 7.32,  $p= 0.919$ ). The increase of scores in intervention group in the post test is five times more than their pretest. Age, socioeconomic, and maternal education as covariates were found to have no influence on any of the dependent variables. Mothers were quoted as the most important source for providing information on RH (41.2) followed by health professionals (26.8%). FGD discussants said that their mothers’ knowledge on RH is very low full of misconceptions, when compared to what they know after intervention. During the discussion 92% of them said “we were ignorant of RH knowledge; our friends who were one of our sources for RH too didn’t have better knowledge than we had”.



**Table 1:** Socio demographic characteristics of, intervention group (n=164) and control group (n=463)

<b>Age in years</b>	<b>Intervention group (n%)</b>	<b>Control group (n%)</b>	<b>total (n%)</b>
13	0(0.0)	2(0.4)	2(0.3)
14	39(23.8)	95(20.5)	134(21.4)
15	66(40.2)	164(35.4)	230(36.7)
16	31(18.9)	133(28.7)	164(26.2)
17	24(14.6)	59(12.7)	83(13.2)
<b>Religion *</b>			
Muslim	10(6.1)	47(10.2)	57(9.1)
Orthodox	148(90.2)	392(84.7)	540(86.1)
Catholic	3(1.8)	12(2.6)	15(2.4)
Protestant	3(1.8)	12(2.6)	15(2.4)
<b>Ethnic Group</b>			
Tigre	5(3.0)	25(5.4)	30(4.8)
Bilen	0(0.0)	2(0.4)	2(0.3)
Tigrinya	159 (97.0)	432(93.3)	591(94.3)
Saho	0(0.0)	4(0.9)	4(0.6)
<b>Father's educational level</b>			
Illiterate	30(18.9)	71(15.3)	101 (16.2)
Elementary	37(22.6)	102(22.0)	139(22.2)
Junior	59(36.0)	169 (36.5)	228(36.4)
Secondary and above	37(22.6)	119(25.7)	156(24.9)
Don't know	1(0.6)	2(0.4)	3(0.5)
<b>Mother's educational level</b>			
Illiterate	36(22.2)	104(22.5)	140(22.3)
Elementary	71(43.3)	196(42.2)	267(42.6)
Junior	40(24.4)	113(24.4)	153(24.4)
Secondary and above	17(10.4)	49(10.6)	66(10.5)
Don't know	0(0.0)	1(0.2)	1(0.2)
<b>Family standard of Living</b>			
No parent/guardian	2(1.2)	3(0.6)	5(0.8)
Very rich	2(1.2)	6(1.3)	8(1.3)

Rich	2(1.2)	44(9.5)	59(9.4)
Middle class	128(78.7)	364(78.6)	493(78.6)
Poor	6(3.7)	23(5.0)	29(4.6)
Very poor	2(1.3)	1(0.2)	3(0.5)
Cannot estimate	8(4.9)	22 (4.8)	30(4.8)
<b>Overall total</b>	<b>164</b>	<b>463</b>	<b>627</b>

**Table 2:** Characteristic and sample size of qualitative data participants

Study participants	Size	Study method	Place of interview
Female student (peer education recipients )	(20), 10 in each group	Two FGD	Intervention school
Five male and 5 female teachers	10	One FGD	Intervention school
Peer educators (female students)	15	One FGD	Intervention school

**Table 3:** Pre-test and post-test Mean score on Reproductive health Knowledge by type of study group

	<u>Intervention group (n=164)</u>			<u>Control group (n=463)</u>		
	<u>Mean score</u>			<u>Mean Score</u>		
	<u>Pretest</u>	<u>post test</u>	<u>P-value</u>	<u>Pretest</u>	<u>post test</u>	<u>P-value</u>
<b>FI. Female reproductive system</b>						
Mention female reproductive organs	0.317	7.40	0.0001*	0.444	0.469	
	0.599					
Mention female reproductive glands.	0.006	1.83	0.0001*	0.026	0.037	
	0.331					
Age at which menarche starts in years	0.866	0.957	0.0001*	0.890	0.897	
	0.711					
Average days of menstrual cycle	0.713	0.963	0.0001*	0.742	0.635	
	0.0001*					
Days in menstrual cycle pregnancy occur	1.83	8.83	0.0001*	1.64	1.70	
	0.803					
<b>Sub-Total</b>	<b>3.73</b>	<b>20.0</b>	<b>0.0001*</b>	<b>3.74</b>	<b>3.74</b>	
	<b>0.998</b>					

**F2. Sexually transmitted Infections (STIs)**

Mention STIs that affects adolescents	0.598	3.25	0.0001*	0.633	0.666	
0.431						
Mention Signs and symptoms of STIs	0.061	2.00	0.0001*	0.041	0.048	
0.695						
Mention Modes of transmission of STIs	0.592	1.72	0.0001*	0.642	0.638	
0.923						
Mention best prevention method of STIs	0.427	1.11	0.0001*	0.564	0.561	
0.949						
<b>Subtotal score</b>	<b>1.68</b>	<b>8.08</b>	<b>0.0001*</b>	<b>1.88</b>	<b>1.91</b>	
<b>0.740</b>						

**Family planning Knowledge**

Where can you find contraceptives?	0.720	1.23	0.0001*	0.791	0.821	
0.474						
Mention the family planning method	0.360	2.00	0.0001*	0.765	0.747	
0.712						
Mention two types of contraceptive pills	0.000	0.994	0.0001*	0.000	0.000	a
Mention contraceptives used in times of rape	0.018	0.804	0.0001*	0.009	0.011	
0.726						
What is the best contraceptive method?	0.159	0.460	0.0001*	0.104	0.090	
0.468						
<b>Sub-total scores</b>	<b>1.26</b>	<b>5.50</b>	<b>0.0001*</b>	<b>1.65</b>	<b>1.67</b>	
<b>0.993</b>						

<b>Grand total score</b>	<b>6.66</b>	<b>33.6</b>	<b>0.0001*</b>	<b>7.29</b>	<b>7.32</b>	
<b>0.919</b>						

\*p<.01; a= p value cannot calculated as the standard deviation is zero

**3.3 Attitude**

As shown in table 4 There is significant change among the intervention and control groups in their attitude toward reproductive health. Proportion difference in attitude: intervention (pretest 42.3% post test 54.7% p= 0.001\*; controls pretest 45% post test 44.8 p= 0.7). Regarding views of premarital sexual relationships and pregnancy out of marriage was unacceptable for intervention and control (90% and 87 % respectively).

**Table 4:** Pre-test and post-test results on Reproductive Health (RH) attitude

<u>Intervention group (n=164)</u>	<u>Control group (n=463)</u>			<u>Response in %</u>		
	Pretest	post test	P-value	Pretest	post test	P-value
Do adolescent girls need RH services	81.1	99.4	0.001*	85.3	84.3	0.7
I can be infected with STI any time	29.3	52.8	0.0001*	28.5	24.7	0.9
Don't accept friend to be infected with STI	41.5	14.1	0.0001*	35.6	36.2	0.8
For a girl to have a boy friend is acceptable	28.7	50.9	0.0001*	38.4	38.6	1.0
Don't accept girls to use of contraceptives	40.9	56.4	0.005	40.4	40.4	1.0
<b>Over all</b>	<b>42.3%</b>	<b>54,5</b>	<b>0.001</b>	<b>45</b>	<b>44.8</b>	<b>0.9</b>

\*p<.01

### 3.4 Practice

Table, 5 shows overwhelmingly high significant changes in RH practice in the intervention group as compared to the controls. Proportion difference in Practice: Intervention (pretest 15.4%, post test 80.4% p= 0.0001\*); Controls (pretest 16.8%, posttest 16.9% p= 0.8). Use of health services was among the deeply discussed issue in the FGD with students. Over 90% of the FGD discussants from the intervention group said “now we are enlightened and feel free after the RH education”, earlier, we didn't know that any unmarried female can go to the health facility and get RH services and advice easily”. Moreover they said “we appreciated the explanation of the head of health services in our sub-zone about what service is available and that every one of us is free to come and get the service”. Nonetheless they said, “the health care providers we met at the health center are friendly while those at the health station are rude” Discussants further emphasized their Peer educators arranged a visit to the two health facilities in the city and majority of us got the basic RH services and advices”. They reported that more than 80% of them had their blood tested for HIV. Finally 100% of them said “Now we know and we will share the knowledge and skills we have to our sisters, neighbors and students who didn't get the education. In the pretest the commonly identified (60%) reason for not using RH services by survey participants (n=627) was shyness and lack of knowledge that RH services are available for unmarried girls.

**Table 5:** Pre-test and post-test results on Reproductive Health service and Practice

<u>Intervention group (n=164)</u>	<u>Control group (n=463)</u>			<u>Response in %</u>		
				<u>Response in %</u>		
	<u>Pretest</u>	<u>post test</u>	<u>P-value</u>	<u>Pretest</u>	<u>post test</u>	<u>P-value</u>
RH health facility use for service/advice	14.3	92.0	0.0001*	23.2	24.5	0.7
Planned to get regular RH service/advice	18.9	91.4	0.0001*	14.0	14.4	0.9
Started getting RH service/advice	12.2	86.5	0.0001*	9.7	8.7	0.6
Gave RH related advice to others	16.5	51.5	0.0001*	20.7	20.3	0.9
<b>Over all</b>	<b>15.4</b>	<b>80.4</b>	<b>0.0001*</b>	<b>16.8</b>	<b>16.9</b>	<b>0.8</b>

\*p&lt;.01

#### 4. Discussion, Conclusion and Recommendation

The study results demonstrated the effectiveness of the Peer reproductive health Education.

The intervention brought significant increased changes in RH knowledge scores, attitude and health service use of adolescent girls.

Majority of study participants (n=627) are homogenous in age and other personal and family demographic variables as shown in table 1, no significant age difference between intervention and controls (p=0.421). Majority (87.3%) of participant's mothers' educational level is below junior that is very low by national standards. Moreover there was no other RH educational program from any source that could confound the findings in the target schools. Thus the results reflected in the intervention group are the sole effect of the peer RH education. Homogeneity, closeness of the learners and peer educators, has facilitated the effectiveness of peer education in this study that helped other studies as well [37, 38].

The knowledge scores (Table 3) in the intervention increased (from 6.66 to 33.6, P=0.0001\*), five times more from pretest to post test while it remained unchanged (7.29 to 7.32; P=0.919) in the control group. Moreover

90% of FGD discussants said “now we know the basics of RH, and we feel empowered to go and get RH advice and services in the health facilities”.

As shown in table 4 as well, the attitude of adolescent girls towards RH have significantly improved in the intervention compared to the controls. Importantly their risk perception has improved that reflect their better understanding of STI. However in some aspects of attitude both intervention and control groups have similarities such as, over 88% from both groups persistently said there is urgent need of health services to adolescent girls that reflect all are deeply concerned about the RH challenges ahead of them . As well both groups (over 84%) did not accept premarital sexual intercourse and having child out of marriage indicating study participants are bounded in the traditional social norms similar to other young girls in developing countries [39,40,41].

Health service use on Table 5, and shows amazingly increased service use, (15.4 to 80.4  $P = 0.0001^*$ ) use of health services in the intervention while it remained the same (16.8 to 16.9) in the controls. The increased RH knowledge of the intervention group influenced their service use as reported from other studies [8,9]. Moreover the changes demonstrated in the intervention group shows the appropriate project planning, relevant educational materials active participation of study participants, and motivation of peer educators. These are factors which have affected effectiveness of health education programs in other studies [8, 9].

Adolescents are exposed to multiple incorrect source of RH information, such as, the media, their peers, parents, and other written materials. The strategies used to teach adolescents about reproductive health are crucial. In developing countries reproduction and sexuality beliefs and practices is deeply rooted in traditions and social norms thus discussion about it among teachers and students is found to be difficult and mothers are the major source of RH information [42, 43.] Studies reported that mothers in Eritrea lack RH and STI knowledge [6, 36]. In spite of their lack of knowledge, in this study mothers are mentioned as the main source (62%) of information. Almost all FGD participants said “now we understand that the information we were getting from our mother and peers are wrong”. Studies indicate most mothers in developing countries are illiterate and ignorant about RH issues who are possibly sources of misinformation, perpetuating misconceptions about sexuality and health [41,40,44, 39, 41,45,46, 47].

Moreover the school health system in Eritrea is not yet established. Sometimes outreach mass student health education is given by non health educator health workers which is not effective and sustainable. Furthermore studies have proved females in traditional society are never free to discuss sensitive RH issues, sexual desires and relationships out of their circles [48, 59]. The points raised in the FGD that hold more weight revealed the truth; they said “because we were of the same age and gender we freely discussed RH issues. I don’t tell my mother or others what I discuss with my friend. It is only with my friend that I can share sensitive personal issues”. Thus the best strategy remains peer led reproductive health education that is effective to teach adolescents.

Studies from developing and developed countries reported peer led reproductive health education have brought significant changes in knowledge, attitude and behavior of adolescents [50, 51,46, 11]. . Moreover peer

education is found to be more cost effective compared to conventional education [43]. For peer education to be effective careful planning taking care of factors that affect outcomes is important. From his review on European Peer Education intervention studies Tolli reported, peer education did not have significant impact on target population that is attributable to gaps in the process of intervention [52].

Overall the success of peer approach in this study was attributable to proper planning, preparation and implantation of the project as recommended by various studies. Recommended factors that facilitate peer education include: age appropriate and accepted education materials, selection, training, arranging in small discussion groups, closeness of the learners and peer educators, school environment, supervision and follow up [51, 52, 31,37,50]. In our study too, support from school principal, close frequent supervision, support and discussion from the principal investigator to the peer educators narrowed the possible gaps in the intervention process.

## **5. Conclusion**

Adolescent girls in Eritrea lack reproductive health knowledge, skills and access to reproductive health services. Moreover mothers who lack RH knowledge are the main source of information to adolescent girls. Besides the study revealed that young girls are facing rape, unplanned pregnancy and forced marriage to legitimize illegal pregnancy country. Considering the magnitude of the problem all study participants said there urgent need of RH education to all young girls in Eritrea.

Therefore peer reproductive health education is effective and remains the best strategy to teach RH information to adolescent girls in Eritrea.

Factors that contributed to the success of the project are: commitment and enthusiasm of peer educators, age appropriate well designed educational material, homogeneity and closeness of the intervention group, support of the school and close supervision by the principal investigator.

## **6. Recommendations**

Consistent with (Roy et al 2007, WHO 2012) the researcher declares, it is more difficult for adolescents to face challenges and opportunities without having age appropriate RH information and services. Thus

- School based peer reproductive health education should be introduced in to all school in Eritrea.
- The education package should be designed jointly by the Ministry of Education, Ministry of Health and the University
- Design a sustainable program that depend on available resource
- Design strategies to educate women using the available structure of National Union of Eritrean Women health units.

## 7. Limitations of the study

Female only study participant limit its generalization to all adolescents.

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## Reference:

- [1] UNFPA. "Adolescents and Young People in Sub-Saharan Africa: Opportunities and Challenges Status Report." Internet: [www.prb.org/Reports/2012/status-report-youth.aspx](http://www.prb.org/Reports/2012/status-report-youth.aspx). 2012 [June, 2013]
- [2] United Nations Children's Fund (UNICEF). *The state of the world's children, adolescence an age of opportunity*. New York, NY 10017, USA: UNICEF 2011.
- [3] V.Chandra-Mouli., A. Camacho., & P. Michaud. "WHO Guidelines on Preventing Early Pregnancy and Poor Reproductive Outcomes Among Adolescents in Developing Countries". *Journal of Adolescent Health*, vol. 52, pp.517-522, 2013.
- [4] P., Regmi., E., Teijlingen., P., Simkhada & D., Acharya. "Dating and Sex Among Emerging Adults in Nepal". *Journal of Adolescent Research*, vol. 6, pp. 26: 675, 2011.
- [5] The World's Youth 2013. "The World's Youth 2013 Data Sheet." at:<http://www.prb.org/Publications/Datasheets/2013/youth-datasheet-2013.aspx/2013> [Jul. 5, 2014].
- [6] A.Gebremicheal., A.Teclebirhan., E. Frezghi., A. Okbazghi., & T. Habitation. *Comprehensive Study on the Nature, Root Causes, and Extent of the Health and Social Problems for Adolescents in and out of School in Eritrea*. Asmara: Ministry of Health Eritrea, 2012, pp. 24-34.
- [7] United Nations Population. *Youth Peer Education Toolkit Training of Trainers Manual*.2005. ISBN: 0-897-14759-6 <http://www.unfpa.org/ypeer/index.htm>
- [8] A. Tegegn., & Y. Gelaw. "Adolescent Reproductive Health Services in Jimma City: Accessibility and Utilization". *Ethiop J Health Sci*, vol 9 (2), 91-102, 2009.
- [9] PI., Okonta., & MI., Osegi. "Relationship between Knowledge of HIV/AIDS and Sexual Behavior among Adolescents in Delata State Nigeria". *Nigerian Journal of Clinical Practice*. Vol 9(1), pp. 37-39, 2006.
- [10] AS., Erulkar., TA., Mekbib., N., Simie., & Gulema . "Differential use of adolescent reproductive health



programs in Addis Ababa, Ethiopia”. *Journal of Adolescent Health*, vol. 38, pp. 253–260, 2004.

[11] S. Jejeebhoy., A. Zavier., & K. Santhya. “Meeting the commitments of the ICPD Program of Action to young people.” *Reproductive Health Matters*, Vol. 21, pp.18-30, 2013.

[12] GM. Omoni. “Teenage. Mothers In Kenya: Seduced, Coerced and at Risk of HIV”. *African Journal of Midwifery and Women’s Health*, vol. 3 (24), 2009.

[13] O., Isikwenu., J., Omokiti, & A., Nurudeen. “Holistic Approach to Reproductive Health Interventions: Talk2 Me Case Study”. *African Journal of Reproductive Health*, vol.14(4), pp. 1 -48, 2010.

[14] Guttmacher Institute. “Facts on Adolescent Women in the Developing World”. Internet: <http://www.guttmacher.org/pubs/FB-Adolescents-SRH.pdf>. 2010 [Jan. 4 2013]

[15] T. Gelibo., T. Belachew., & T. Tilahun. “Predictors of Sexual Abstinence among Wolaita Sodo University Students, South Ethiopia.” *Reproductive Health*, Vol.10(18), 2013.

[16] Guttmacher. “Facts on Induced Abortion Worldwide.” Internet: [www.guttmacher.org/media/inthenews/2012/10/04/index.html](http://www.guttmacher.org/media/inthenews/2012/10/04/index.html), June 2012 [Mar,15 2014]. accessed on August 2013.

[17] L. Ikamari., C. Izugbara, & R. Ochako. “Prevalence and Determinants of Unintended Pregnancy among Women In Nairobi, Kenya.” *BMC Pregnancy and Childbirth*, vol, 13(69), 2013.

[18] Bankole, A. Biddlecom, A. Guiella, G. Singh, S. & Zulu, E. (2007) Sexual Behavior, Knowledge and Information Sources of Very Young Adolescents in Four Sub-Saharan African Countries, *African Journal of Reproductive Health*. 11(3): 28-43.

[19] W.Blum., & K. Nelson-Mmari. “The Health of Young People in a Global Context”. *Journal of Adolescent Health*, vol. 24, pp. 402-418, 2004.

[20] E.Jackson., B. Johnson ., H. Gebreselassie. G. Kangaude. & E. Mhangoe. A Strategic Assessment of Unsafe Abortion In Malawi. *Reproductive Health Matters*, vol.19, pp.133-143, 2011.

[21] A., Koenig, I., Zablotska., T., Lutalo., F., Nalugoda., J., Wagman., & R., Gray. “Coerced First Intercourse and Reproductive Health Among Adolescent Women in Rakai, Uganda”. *International Family Planning Perspectives*, Vol. 30 (4), 2004.

[22] Ministry of Health Eritrea. *Health Information System Ministry of Health Eritrea Annual Activity Report*. 2013, MoHE.

[23] B. Sebbatu. “Determinants of Immediate Complications of Abortion: a Study done in Mekane-Hiwot Maternity Hospital between June and August 2003.” *Journal of Eritrean Medical Association*, vol. 1, pp. 3-13,

2006.

[24] I., Abdulraheem., & O., Fawole. "Young People's Sexual Risk Behaviors in Nigeria". *Journal of Adolescent Research*, vol 24 pp 505, 2009

[25] World Health Organization. *The Second Decade. Improving Adolescent Health and Development*. 2001 WHO/FRH/ADH/98.18 Rev 1 Distr.: General,

[26] International Conference on Population and Development (ICPD). *Program Paragraph 7.44: objectives a and b. A/CONF.171/13: Report of the ICPD (94/10/18)*. 1994.

[27] Ministry of Health Eritrea (MoHE). *National Sexual and Reproductive Health Strategic Plan 2011-2015*. Asmara: MoHE, 2010, pp.22-25.

[28] Ministry of Health Eritrea (MoHE). *National Adolescent, development Policy Ministry of Health August*. 2012. UNICEF. MoHE.

[29] Ministry of Health Eritrea (MoHE). *The Road Map for Maternal and Newborn Health 2012-2016*. Asmara: MoHE, 2011, pp. 11-15

[30] D., Kirby., B., Laris., & L., Roller. *Sex and HIV Education Programs for Youth: Their Impact and Important Characteristics*. 2006. Family Health International, Research Triangle Park, NC

[31] R., Cartagena., P., Veugelers., W., Kipp., K., Magigav., & l., Laing. "Effectiveness of an HIV Prevention Program for Secondary School Students in Mongolia." *Journal of Adolescent Health*. vol.39 , pp. 925.e9 – 925.e16, 2006.

[32] International Planned Parenthood Federation , *Included Involved Inspired | Framework of good practice for an effective IPPF peer education program*.2007. International Planned Parenthood Federation. ISBN: 1-933702-07-9. [www.fhi.org/youthnet](http://www.fhi.org/youthnet)

[33] S., Adamchak. *Youth Peer Education in Reproductive Health and HIV/AIDS: Progress, Process, and Programming for the Future*. 2006.Family Health International.

[34] Zoba Dehub. Annual Activity Report. 2013. Zoba Dehub. Eritrea Mendefera.

[35] Ministry of Education Eritrea (MoHE). *Annual Ministry of Education National Activity Report*. Asmera, MoHE, 2013 pp. 30-35.

[36] Eritrean, Health and Population Survey (EHPS). *Eritrean Health and Population Survey*. Asmara, Sabur, 2013 pp 35.52.

[37] AH.,Catherine., and AI., Barbara. *Social Net Work and Social Support. Health Behavior and Health*

*Education: Theory and Practice*. 3<sup>rd</sup> edi 2002. JOSSEY-BASS.

[38] D., Güldal., V., Mevsim., T., Günvar., & N., Özçakar. "The perspective of peer educators: What are their experiences, feelings, and thoughts?" *Health* vol 4, pp. 349-356, 2012.

[39] K., Nwalo., & N., Anasi. "Access to and use of reproductive health information among in-school adolescent girls in Lagos State, Nigeria". *Health Education Journal*, vol. 71(1), pp. 90-101, 2012.

[40] SA. Mosavi., R. Babazadeh., KM. Najmabadi., & M.Shariati. "Assessing Iranian Adolescent Girls' Needs for Sexual and Reproductive Health Information". *Journal of Adolescent Health*. vol. 55, pp. 107-113, 2014.

[41] M. Wahba., & F. Roudi-Fahimi. "The Need for Reproductive Health Education in Schools In Egypt". Internet: [www.prb.org](http://www.prb.org), 2012 [Jun. 6, 2014]

[42] S., Pokharel., A., Kulczycki., & S., Shakya. "School-Based Sex Education in Western Nepal: Uncomfortable for Both Teachers and Students." *Reproductive Health Matters* . vol.14(28), pp. 156–161, 2006.

[43] S., Parwej., R., Kumar., I., Walia ., & A., Aggawal A. "Reproductive Health education Intervention Trial". *Indian Journal of Pediatrics*, Vol 72, pp. 207-291, 2005.

[44] K. Shiferaw., F. Getahun. & G. Asres. "Assessment of adolescents' communication on sexual and reproductive health matters with parents and associated factors among secondary and preparatory schools' students in Debremarkos town, North West Ethiopia". *Reproductive Health*, vol 11(2), 2014.

[45] J. Wamoyi., A. Fenwick., M. Urassa., B. Zaba., & W. Stones. "Parent -child communication about sexual and reproductive health in rural Tanzania: Implications for young people's sexual health interventions". *Reproductive Health*, vol. 7 (6), pp.1-18, 2010.

[46] Bankole, A. Biddlecom, A. Guiella, G. Singh, S. & Zulu, E. "Sexual Behavior, Knowledge and Information Sources of Very Young Adolescents in Four Sub-Saharan African Countries". *African Journal of Reproductive Health*, vol 11(3), pp. 28-43, 2007.

[47] C. Reeves, R. Whitaker. R. Parsonage. C. Robinson., K. Swale. & L. Bayley. "Sexual Health Services and Education: Young People's Experiences and Preferences." *Health Education Journal*, vol 65, pp. 368-379, 2006.

[48] X., Sun., JF., Zhou., Yan F, Q., Yin., J., Mao., C., Huang., et al. Study of Peer-led Intervention on Reproductive Health Education and AIDS Prevention in Joint Venture Factories in Kunshan County. *Journal of Reproduction & Contraception*, vol.18(2), pp 133-144, 2007.

[49] A., Malhotra., & M., Mehta., "Adolescent girls' life aspirations and reproductive health in Nepal." *Reproductive Health Matters*, vol. 9(17), pp. 90-100, 2001.

[50] I. Speizer., R. Magnani., & C. Colvin. “The Effectiveness of Adolescent Reproductive Health Interventions in Developing Countries: A Review of the Evidence”. *Journal Of Adolescent Health*, vol.33, pp. 324–348, 2003.

[51] H. Burke., K. Pedersen.,& N. Williamson N. “An assessment of cost, quality and outcomes for five HIV prevention youth peer education programs in Zambia”. *Health Education Research*, vol.27(2), pp. 359-369. 2012.

[52] M. Toli. “Effectiveness of peer education interventions for HIV prevention, adolescent pregnancy prevention and sexual health promotion for young people: a systematic review of European studies”. *Health Education Research*, vol.27 (5),pp. 904–913, 2012.