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Knowledge and Attitude Regarding Pubertal Changes among Pre-Adolescent Boys: An Interventional Study in Rural Area in India

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Abstract

Purpose: During puberty growth is rapid and confusing, especially compared to the relatively earlier period of childhood. The purpose of this study was to compare the knowledge and attitude regarding pubertal changes among pre–adolescent boys before and after the pubertal preparedness programme (PPP) in experimental and comparison/control group or control group.

Methods: A Quasi experimental (non-equivalent comparison/control group pre-test post-test) design was adopted with 100 pre-adolescent boys (50 in each experimental and comparison/control/control group) of age 12-14 years, selected by purposive sampling from two different rural government schools of Ambala District. The Knowledge and attitude of both groups were assessed using structured knowledge questionnaire (KR-20=0.77) and 5 point likert scale (Cronbach's alpha=0.76), respectively. On the same day of pre-test, pubertal Preparedness Programme (PPP) was administered only to the experimental group and on 12th day Frequently Asked Questions (FAQs) reinforcement session was held only for experimental group. After 28 days, post-test was taken to both groups.

Results: The computed t value of pre-test scores of knowledge and attitude of pre-adolescent boys were 1.96 vs. 1.75 respectively in experimental and comparison/control/control group which was found to be non-significant at 0.05 level of significance which shows that both group didn't differ significantly in their knowledge and attitude before the administration of PPP intervention. Findings of unpaired 't' value of post-test knowledge and attitude scores of pre-adolescent boys were 14.25 vs. 10.98 respectively in experimental and comparison/control/control group were found significant at 0.05 level of significance. Thus, knowledge and attitude of pre-adolescent boys were improved with PPP and FAQs session.

Conclusion: PPP and FAQs (frequently asked questions) reinforcement session are effective in enhancing knowledge and developing favorable attitude among pre-adolescent boys.

Keywords: Preadolescence; Pubertal preparedness programme; Pubertal changes; Sex education

Introduction

Adolescence is a period of transition between childhood and adulthood – a time of rapid physical, cognitive, social and emotional maturation as the boy prepares for manhood. The precise boundaries of adolescence are difficult to define, but this period is customarily viewed as beginning with the gradual appearance of secondary sexual characteristics at about 11 or 12 years of age and ending with cessation of body growth at 18 to 20 years. Adolescence which literally means, "to grow into maturity". It involves three distinct sub phases: early adolescence (pre adolescence) (age 11 to 14 years), middle adolescence (ages 15 to 17 years), and late adolescence (ages 18 to 20 years) [1]. Adolescents – defined by the United Nations as those between the ages of 10 and 19 – number 1.2 billion in 2010, forming 18 percent of world population [2]. Adolescent population in India has increased from 85 million in 1961 to 253 million in 2011 (in five decades) [3] and in Haryana, percentage of adolescent's population is approx. 21% [4].

The most dramatic changes related to adolescence are the physical changes that occur as a part of pubertal process [5]. Puberty includes maturational, hormonal and growth process that occurs when the reproductive organs begin to function and the secondary sex characteristics develop [1]. During puberty, growth is disorganized confusing and rapid, compared to the relatively stable earlier period of childhood. When pubescent children are not informed of the changes that take place at puberty, it is traumatic to undergo these changes and may develop unfavourable attitudes towards these changes [6].

Studies have shown that there are still many misconceptions and misbelieves regarding issues related to sexuality in adolescence, which should be tackled comprehensively by imparting formal puberty and sex education at proper age [5]. Another study shows that twenty eight percentages do not like the changes due to puberty, in their body. Twenty three percentages were worried about shape and size of their penis and 60% accept that they feel mood swings sometimes [7]. Various studies concluded that reproductive health is ignored and queries go unanswered [8]. Adolescent possess some knowledge about reproductive health but still effective educational intervention is required to encourage more sensible and healthy behaviour and results of a study shows health education sessions are very effective in increasing knowledge [7-9].

With this background, the study was aimed to assess and compare the knowledge and attitude of pre-adolescent boys in experimental and comparison/control group before and after the pubertal preparedness programme in rural areas.

Methods

Study design

This quantitative study was based on quasi experimental, non-equivalent comparison/control groups. Pre-test and post-test are design to test and compare two groups of participants at two specified time points: one group with and the other without PPP and an evaluation of both 28 days later.

Design and settings

The study was conducted in two government rural schools of Mullana and Barara village of Ambala District Haryana, India selected by convenience sampling and randomized. Data was collected between December and January 2015 after obtaining clearance from the "institutional ethical committee" of MM University.

Setting and sample

The study participants selected by purposive sampling technique comprised of 100 pre-adolescent boys (50 in each experimental and comparison/control/control group) of 12-14 years age group studying in 8th and 9th class from two rural government schools (selected by convenience sampling) of Mullana and Barara village of Ambala District Haryana, and randomized to experimental and comparison/control groups.

Ethical consideration

Ethical approval was taken from the MM University institutional ethical committee (IEC) (under the project number 375). Written informed consent was obtained from the parents (legal guardian) and assent was obtained from all participants before starting the study.

Measurements/instruments

Knowledge and attitude was assessed using a structured knowledge questionnaire and 5 point likert scale. Both tools were validated by 7 experts in the various nursing fields. Reliability of tools was checked. The reliability coefficient of structured knowledge questionnaire for boys was found 0.77 by Kudar Richardson-20 formula and for attitude scale it was found 0.76 for boys by Cronbach's alpha. Structured knowledge questionnaire containing 36 multiple choice questions was used with Areas like reproductive organs, concept of puberty, secondary sexual characteristics, nocturnal emission of semen and emotional changes. A five point likert scale ranging strongly agree to strongly disagree containing 33 statements was used, out of which 17 were positive statements and 16 were negative. The maximum score was 165 and minimum score was 33.

Data collection/procedure

After obtaining the formal approval from the principals of Government rural schools of Mullana and Barara village of Ambala district, Haryana, India, the group could be studied. All the groups were given an initial pre-test to assess the knowledge and attitude regarding pubertal changes.

The experimental was given the pubertal preparedness programme (PPP) using audio visual aids. After that on 12th day a reinforcement session using FAQs (frequently asked questions) session was held to develop favourable attitude among pre-adolescent boys and post-test was conducted after 28 days of PPP (pubertal preparedness programme).

For comparison/control/control group, on first day pre-test and after 28 days post test was conducted to assess the knowledge and attitude regarding pubertal changes without giving any intervention.

Intervention

Pubertal preparedness programme (PPP) is a presentation of 45-50 min duration and was structured to enhancing knowledge and to develop favourable attitude regarding pubertal changes.

The content outline included Introduction to the male reproductive system, a discussion of the various stages of the pubertal period, physical changes – secondary sexual characteristics, Nocturnal emission (wet dreams) and various emotional changes that occur during puberty.

Lecture cum discussion method was adopted for teaching.

Data analysis

Data were entered into Microsoft Excel 2007 and analyzed using SPSS 17.0. Categorical data are presented as mean (Standard Deviation) or median based on the distribution of data. Statistical analysis was performed by using t test for continuous variables and chi square for categorical variables. A p value of 0.05 or less was considered significant.

Results

Base line characteristics: Frequency, percentage distribution and chi square was computed to describe the sample characteristics of the sample and characteristics similarities of the sample in both experimental and comparison/control/control group. The baseline sample characteristics of the participants showed that in experimental group vs. comparison/control/control group more than half boys 54% vs. 60%, respectively were of 9th grade class and the remaining, 46% vs. 40% respectively, were of 8th grade class y. Among these 52% vs. 62%, respectively were aged 14. Most of boys 72% vs. 64%, respectively were Hindu. In the experimental group less than half of boys' fathers (30%) were illiterate and mothers 38% had education up to primary and 32% were illiterate and in comparison/control group 36% father and 34% mothers had education up to secondary. Majority of boys' father (72%) in experimental group and 46% in comparison/control group were labourer and mothers of majority of boys in experimental group, 74% vs. 82%, in comparison/control group were home maker. 98% of the boys in experimental group and 100% in comparison/control group had knowledge regarding puberty and for them source of information were parents and books.

Findings of the further study show that, for 27% of pre-adolescent boys, source of information regarding puberty was friends followed by internet (19.14%). Friends were major source of information regarding pubertal changes.

The computed chi square value for the sample characteristics of experimental and comparison/control groups' boys were found to be non-significant at 0.05 level of significance, revealing that boys in both groups had equal knowledge before the administration of pubertal preparedness programme.

Mean, mean percentage, median and standard deviation of pre- and post-test knowledge and attitude score of pre-adolescent boys in experimental and comparison/control group were calculated and presented in Table 1.

Group		Range of Score		Mean				Median		Standard Deviation	
		Pre-test	Post-test	Pre-test	%	Post-test	%	Pre-test	Post-test	Pre-test	Post-test
knowledge	(E)	8-22	13-30	15.46	42.94	22.56	62.66	16	22	3.63	3.64
	(C)	6-22	7-20	13.98	38.83	12.84	35.66	14	12.5	3.9	3.15
Attitude	(E)	75-106	101-135	93.44	56.63	112.74	68.32	94	112	6.51	7.97
	(C)	72-111	74-106	91	55.15	94.94	57.33	91.5	96	7.39	8.23

Table 1: Range of score, mean, mean percentage, median and standard deviation of pre-test and post-test knowledge and attitude score of pre-adolescent boys regarding pubertal changes in experimental and comparison/control group, knowledge max score:-36, minimum score:-0, attitude max score:-165, minimum score:-33.

't' Value of pre- and post-test knowledge and attitude score of pre-adolescent boys in experimental and comparison/control group: The computed 't' value of pre-test knowledge and attitude scores of pre-adolescent boys 1.96 vs. 1.75, respectively was found to be statistically non-significant being more than 0.05 level of significance thus suggesting that both group (experimental and comparison/control) do not differ in their knowledge and attitude significantly before the administration of intervention. On the other hand, post-test findings of unpaired 't' value of knowledge and attitude score of pre-adolescent boys, 14.25 vs. 10.98, respectively, in experimental and comparison/control group were found significant at 0.05 level of significance, Thus knowledge and attitude of pre-adolescent boys were improved with PPP and FAQs session.

In order to determine the significance between pre-test and post-test, area wise 't' value was computed and presented in Tables 2 and 3.

Group	Area	Pre-test Mean	Post-test Mean	Mean $_D$	SD_D	SE_{MD}	t value
Experimental group (n=50)	Reproductive organs	2.36	3.82	1.46	1.89	0.26	5.44*
	Concept of puberty	3.24	4.82	1.58	2.02	0.28	5.53*
	Secondary sexual characteristics	3.38	4.76	1.38	1.96	0.27	4.96*
	Nocturnal emission of semen	3.68	5.84	2.16	2.28	0.32	6.67*
	Emotional changes	2.8	3.32	0.52	1.54	0.21	2.19*
Comparison group (n=50)	Reproductive organs	2.34	2.36	0.02	2.05	0.29	0.06 ^{NS}
	Concept of puberty	2.68	2.38	0.3	1.71	0.24	1.24 ^{NS}
	Secondary sexual characteristics	3.3	2.88	0.42	2.43	0.34	1.22 ^{NS}
	Nocturnal emission of semen	3.62	3.28	0.34	2.2	0.31	1.09 ^{NS}
	Emotional changes	2.04	1.94	0.1	1.58	0.22	0.45 ^{NS}

Table 2: Area wise mean, mean difference, standard deviation of difference standard error of mean difference and 't' value of pre-test and post-test knowledge score of pre-adolescent boys in experimental and comparison/control group, N=100, 't' (49)=1.68 ($p \leq 0.05$), * significant, NS: Non-Significant.

Group	Areas	Pre-test Mean	Post-test Mean	Mean Deviation	SD_D	SE_{MD}	t value

Experimental group (n=50)	Concept of puberty	46.46	54.78	8.32	5.77	0.81	10.18*
	Secondary sexual characteristics	10.5	14.82	4.32	5.92	0.83	5.15*
	Nocturnal emission of semen	14.2	17.82	3.62	2.68	0.38	9.53*
	Emotional changes	22.28	25.32	3.04	5.17	0.73	4.15*
Comparison group (n=50)	Concept of puberty	44.88	47.88	3	7.29	1.03	2.91*
	Secondary sexual characteristics	10.22	9.4	0.82	3.1	0.43	1.87 ^{NS}
	Nocturnal emission of semen	13.78	15.08	1.36	3.7	0.52	2.59*
	Emotional changes	22.18	22.58	0.4	4.37	0.62	0.65^{NS}

Table 3: Area wise mean, mean difference, standard deviation of difference standard error of mean difference and 't' value of pre-test and post-test attitude score of pre-adolescent boys in experimental and comparison/control group, N=100, 't' (49)=1.98 ($p \leq 0.05$), * significant, NS- Non Significant

The computed 't' value for knowledge scores in the experimental group after PPP was found to be statistically significant at 0.05 level of significance in all areas that covered reproductive organs, concept of puberty, secondary sexual characteristics, nocturnal emission of semen and emotional changes but in comparison/control group, computed 't' values for all areas were found to be statistically non-significant at 0.05 level of significance (Table 2).

The computed 't' value for attitude scores in experimental group was found to be statistically significant at 0.05 level of significance in all areas that covered concept of puberty, secondary sexual characteristics, nocturnal emission of semen and emotional changes. However in comparison/control group computed 't' value for all areas was found to be statistically non-significant at 0.05 level of significance except area of nocturnal emission of semen (2.59), this increase in area could be because of sensitization of pre-test or some of them might had experienced nocturnal emission of semen in mean time (Table 3).

The finding of the present study revealed that 40.5% boys were aware about concepts of puberty, 39.33% boys have knowledge about reproductive organs and their functions, 42.3% boys were aware about secondary sexual characteristics and 46.7% boys were aware about emotional changes.

Findings regarding correlation: A significant, low, positive correlation was found between mean post-test knowledge and attitude scores of pre-adolescent boys regarding pubertal changes as evidenced by computed 'r' value of (0.28) as shown in Figure 1.

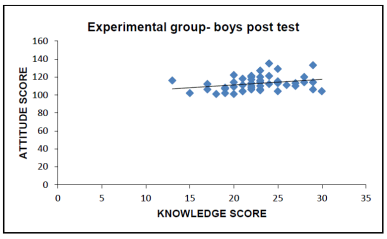

Figure 1: Scatter Plot Showing the correlation between knowledge and attitude scores obtained by pre-Adolescent boys in experimental group post test.

ANOVA/t values showing the association of the level of post knowledge and attitude scores of pre-adolescent boys with sample characteristics: The findings of ANOVA/t values showing the association of level of post knowledge and attitude scores of pre-adolescent boys with source of information (0.00) and (0.02), respectively were found to be significant at 0.05 level of significance. This denotes the association of source of information with the obtained knowledge and attitude scores.

Discussion

The finding of the present study revealed that 40.5% boys were aware about concepts of puberty, 39.33% boys have knowledge about reproductive organs and their functions, 42.3% boys were aware about secondary sexual characteristics and 46.7% boys were aware about emotional changes. The study finding were consistent with finding of a cross sectional study conducted in block Beri, District Jhajjar (Haryana) regarding assessment of self-awareness of rural adolescent students regarding adolescent changes. Findings shows that 50% boys were aware about physical changes in their bodies during puberty, 30.6% boys have knowledge about sexual development changes and total 23% were aware about emotional changes during puberty [10].

The PPP was effective in enhancing the knowledge and attitude of pre-adolescent boys. In the presents study, mean post-test knowledge and attitude scores of pre-adolescents, in experimental group 24.33 vs. 94.21, respectively was higher than the mean pre-test knowledge and attitude scores 14.83 vs. 117.88 respectively. Similar findings were reported in an interventional study conducted in 2014 to assess knowledge and attitude regarding growing up changes among adolescents in Pune, findings showed that both knowledge and attitude scores improved significantly after intervention pre-test knowledge and attitude mean was 9.82 and 109.86 and post-test knowledge and attitude mean was 14.11 and 130.59, respectively [11]. These findings was also found inconsistent with a study held in Tanzania in 2011, shows that the boys' mean score in the knowledge pre-test was 6.4 and 7.0 in post-test, which increased significantly (t=4.5, p=0.000) but in attitude pre-test and post-test increase was not observed, mean (30.8) (t=0.00, p=0.973) was same in both in both [12].

Findings of present study further shows that, for 27% of pre-adolescent boys source of information regarding puberty was friends followed by 23.8% was elder siblings. 22% gain information from

books and television followed by internet (19.14%). Almost similar findings were reported in a study conducted in Varanasi in 2014. The survey found that 10 percent boys discuss their problems with their parents. Teenagers are understandably more comfortable discussing their problems and personal experiences with their friends. It has been found that 51 percent boys discuss their problems with their friends [13]. Similarly in findings of study conducted in Tehran, Iran, shows that, Adolescents' preferred sources of in- formation about puberty were parents (17%), peers for 20% or teachers (21%). 12% of adolescents said that books and magazines were their preferred source of information on puberty [14].

Conclusion

Pre-adolescent boys, who were exposed to PPP, had significantly higher knowledge and favorable attitude than pre-adolescent boys who were not exposed to pubertal preparedness programme. Pre-test knowledge and attitude scores were equal and deficient.

Therefore the study concluded that structured pubertal preparedness programme and a FAQs (frequently asked questions) reinforcement session was effective in terms of enhancing knowledge and developing favorable attitude of pre-adolescent boys regarding pubertal changes after 28 days.

It is recommended that these kinds of programmes need to be enforced in curriculum. As this was a study over 28 days with the FAQs possibly enhancing the scores, school need to give these programmes and repeat frequently.

Strength

Pubertal preparedness programme and FAQs session were effective in enhancing knowledge and developing favourable attitude among pre-adolescent boys of rural areas.

Limitations

- Sample taken for the study was only from 2 rural schools because of time constraints. This limits the generalization of the study.
- Study subjects were not selected by randomization.
- The study was limited only to rural pre-adolescent boys studying in government schools.
- In the present study the pubertal preparedness programme was administered only once to the pre-adolescent boys.

Recommendation for the further studies

- A study can be replicated on a large sample of pre-adolescent boys in selected areas of Haryana for wider generalization of the findings.
- Same study can be conducted on school dropout pre adolescents.
- A study can be carried out using other teaching strategies like information booklet, SIM, etc.
- A study can be undertaken to assess the impact of child to child teaching on knowledge and attitude of pre-adolescent boys regarding pubertal changes.
- Comparative study can be conducted to assess the effectiveness of structured teaching programme and peer group teaching programme regarding pubertal changes.
- A qualitative study can be undertaken to assess the experience of pre-adolescent boys regarding pubertal changes.
- Comparative study can be conducted to assess knowledge, attitude and practice regarding reproductive health among Urban and Rural pre adolescents.
- A study can be conducted to assess parent's perception and attitude toward education regarding pubertal changes.
- A study can be conducted to assess teacher's perception and attitude toward special education camps/classes regarding pubertal changes at school level.
- A longitudinal study can be conducted to assess level of coping among pre adolescents regarding pubertal changes.

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