Effect of Intervention on knowledge of rural school going adolescent girls about pubertal changes

Abstract

Aim: The study focused on measuring effect of intervention on knowledge of adolescent girls in rural areas about different pubertal changes occurring to them.

Study Design: The study had a cross sectional design with intervention given to the experimental groups.

Place and Duration of study: Varanasi district, 2 years.

Methodology: The sample consisted of 240 school going adolescent girls in the age range of 12 to 18 years selected from five villages of Varanasi district in Uttar Pradesh. A self structured interview schedule was used for data collection. The educational intervention regarding awareness about changes during adolescent years was given in the form of lectures, discussions, video shows, etc for three months in the selected schools. The data was analysed applying paired t test for knowing the significant effect of intervention.

Results: Respondents showed lack of knowledge regarding meaning of menstruation, male and female reproductive organs, growth of primary and secondary sex characteristics during adolescence and external and internal changes in body during adolescence. Significant differences were seen in awareness regarding aspects of pubertal changes during adolescence among respondents due to intervention among respondents of experimental group.

Conclusion: Educational intervention in the schools can be an effective means to bring on significant changes in the knowledge levels of adolescent girls.

Key words: Adolescence, Intervention, Puberty, Health

Introduction

Adolescents are an important subgroups of the population and constitute almost 21 % of the country's population (i.e. about 268 million)[1]. This is the transient phase which requires proper guidance, awareness and knowledge about various aspects of life so as to develop into healthy adults. It is the time when the adolescent not only experiences physiological changes but also emotional, social and mental changes. Adolescent girls, being in the vulnerable zone of "females," are exposed to different kinds of restrictions within their families due to cultural demands. This is coupled with being dependent on others regarding decisions on education, work, marriage and other social responsibilities. Evidences are there about poor knowledge and lack of awareness about physical and psychological changes occurring during adolescence and this goes hand in hand with their vulnerability to fall for different kinds of health problems related to reproductive health, substance abuse and many other issues[2,3,4]. Thus the health and development need of this section of the population is huge and needs to be addressed properly.

Adolescence is period in which different habits are formed and is a phase of increased risk taking and susceptibility to various problems during the time of puberty. Adolescents experience various kinds of changes occurring in their bodies due to the effect of various hormones. Past researches have verified the effects of puberty on adolescent moods, self image and interaction with peers and parents[5]. There is a marked development regarding reproductive biology yet adolescents often lack knowledge of reproductive health issues. According to a review study by Bej [6], awareness about sexuality and other reproductive health issues varied from 40 % to poor. This is coupled with the absence of scientific and authentic information to know and understand these issues and causes anxiety and curiosity among the adolescents who may thus be pushed into different courses of actions without having a chance to think fully of the consequences. Even information about physical maturation is often not disclosed within the family, on the assumption that the silence will convey the taboo nature of this topic, protect a child's innocence and encourage appropriate behavior. . Santhya and Jejeebhoy[5] have highlighted that although there are many national programmes that aim to address the needs of the young, youth are, for the most part, unprepared to meet the needs of a globalizing world. The schools which are considered to be as temples of learning, also do not address the issues of growing up and many times the teachers skip the chapters in the books pertaining to adolescence or growing up or even reproductive system. As a result, the adolescent boys and girls fail to gain

proper knowledge and often resort to faulty methods of acquiring knowledge. A study done in Iran emphasized on role of secondary schools in improving the attitudes and knowledge of adolescents towards pubertal changes[8]. Researches also indicate that good knowledge and attitudes regarding puberty helps in preparing adolescents not only for promoting their physical health but also it helps in coping gor their struggles with puberty[9. 10].

Thus a study was planned to know the levels of understanding related to pubertal changes among school going adolescent girls and the effect of educational intervention on their knowledge.

Material and Methods

The present study adopted a cross-sectional approach with an experimental design. The respondents were divided into experimental and control groups with the experimental group receiving intervention for a period of three months

Study area and sample:

The study was carried out in the various government schools of Varanasi district of Uttar Pradesh. Multi-level stratified sampling was used wherein one district from the state was selected, then block and finally the schools where the study was conducted. A total of 240 school going adolescent girls were taken as sample and were selected from various government schools of the selected district areas.

A list of secondary and senior secondary schools of the respective block (Araijiline) was obtained and four government schools which had more than 100 girl students enrolled at secondary level, were finally selected randomly. The principals of the schools were contacted and were briefed about the importance of the study and the willingness of the participants was sought. Accordingly 60 adolescent girls were selected between the age group of 12 to 18 years and from 8^{th} to 12^{th} standards of each school, thus making 240 girls.

Tools

A self-structured interview schedule was used for collecting data. It consisted of sections of background information and specific information related to knowledge regarding aspects of menstruation. Each participant was contacted separately in the school and the desired information was sought. From the baseline data it was seen that although girls in the selected

schools showed low levels of knowledge, two schools with maximum percentage of respondents having low levels of knowledge, from each district, were finally selected for the intervention programme. Thus two schools (with 120 girls) were selected as control group while intervention was provided to the rest 120 girls for a period of three months (Experimental group).

The intervention programme consisted of participatory sessions involving lectures and discussions on topics of adolescence, physical changes during adolescence, importance of puberty, etc. Post testing was done after a gap of one month from the last day of intervention programme to measure the impact and gain in knowledge levels. Respondents from the four selected schools in were interviewed by the use of the same interview schedule that was used at the time of pre-testing.

Analysis

The data was coded, scored and compiled for final analysis through the use of SPSS (version 17.0). Appropriate statistical measures were applied to ascertain the impact of intervention.

Results and Discussion

Socio-demographic profile

The socio-demographic profile of the respondents is presented in Table 1 and it can be seen that majority of them were between the age group of 15 to 16 years and were studying in 11^{th} and 12^{th} standards, i.e. above high school level. Majority of the parents were educated till upper primary level. Maximum percentage of girls had medium- sized families with five to eight members with a monthly income in the range of Rs 5000/- to Rs 10000/-. The caste composition of the rural families revealed that about 39.02 per cent were in the OBC group.

Table 1. Socio-demographic profile of rural respondents

Sl. No.	**Categories**	**Sample (n = 240)**
1.	Age	
	12 to 14 years	26.3
	15 to 16 years	45.8
	Above 16 years	27.9
2.	Education	

	Below High School	33.8
	High School	23.3
	Above High School	42.9
3.	Education of mothers	
	Illiterate	23.1
	Primary	16.8
	Upper primary	35.3
	High school	18.1
	Intermediate	2.5
	Graduate & Above	4.2
4.	Education of Father	
	Illiterate	1.8
	Primary	3.1
	Upper primary	33.8
	High school	30.2
	Intermediate	16.9
	Graduate & Above	14.3
5.	Family size	
	Small (1 – 4 members)	5.0
	Medium (5 to 8 members)	59.2
	Large (Above 8 members)	35.8
6.	Caste	
	General	22.1
	SC	38.8
	ST	-
	OBC	39.2
7.	Monthly income of families	
	Upto Rs 5000/-	2.1
	Rs 5001/- to Rs 10000/-	35.4
	Rs 10001/- to Rs 15000/-	32.1
	Above Rs 15000/-	30.4

Note: All figures in percentage

Table 2.Awareness of respondents regarding meaning of reproductive system before and after intervention

Responses	Rural							
	Exp (n=120)				Con (n=120)			
	Pre		Post		Pre		Post	
No Knowledge	112	93.3	22	18.3	119	99.2	101	84.1
A system where new individuals are produced	0	0	36	30.0	0	0	0	0
Reproductive organs of body	0	0	69	57.5	1	0.8	6	5.0
Child birth process	8	6.6	0	0	0	0	13	10.8

Distribution of respondents according to their awareness regarding meaning of menstruation is being depicted in Table 2. It can be seen that most of the respondents among both the groups (93.3% : experimental and 99.2 % : control) did not know about the meaning of reproductive system during pre-test. The whole reproductive system of males and females were explained during the sessions of intervention and the post testing data showed gain in knowledge as evident from increase in percentage from 0 (pre-test) to 30 per cent (at the time of post-test) who related the meaning to a system where new individuals are produced and 0 (during pre-test) to 57.5 per cent (during post-test) for reproductive organs of the body among experimental group. No such change was observed among the control group respondents. Thus intervention resulted in gain in knowledge with respect to meaning of reproductive system. The results of the present study are supported by findings of Rathinasabapathy[11] who found a similar kind of situation where poor knowledge on reproductive organs and its meaning was reported by study participants during pre test which increased after providing education intervention to the adolescent girls

Table 3.Knowledge of respondents on reproductive organs and their functions before and after intervention

Responses	Respondents							
	Exp (n=120)				Con (n=120)			
	Pre		Post*		Pre		Post	
	F	P	F	P	F	P	F	P
Male reproductive organs								
Testes	0	0	53	44.2	0	0	0	0
Function (production of sperms)	0	0	52	43.3	0	0	0	0
Penis	0	0	56	46.7	0	0	1	0.8

Function (release of urine & semen)	0	0	56	46.7	0	0	0	0
Scrotum	0	0	30	25.0	0	0	0	0
Function (holds testes)	0	0	28	23.3	0	0	0	0
Female reproductive organs								
Ovaries	1	0.8	70	58.3	1	0.8	1	0.8
Function (production of eggs)	0	0	48	40.0	0	0	0	0
Uterus	2	1.7	59	49.2	5	4.2	5	4.2
Function(baby develops)	1	0.8	36	30.0	5	4.2	6	5.0
Fallopian tube	0	0	31	25.8	0	0	0	0
Function	0	0	23	19.2	0	0	0	0
Vagina	2	1.7	60	50.0	0	0	0	0
Function	0	0	60	50.0	0	0	0	0

***** The total percentage may be more than 100 due to multiple responses

Respondents were enquired about the various male and female reproductive organs present in the body along with their functions (Table.3) and the pretest data showed complete lack of knowledge among the respondents. It was surprising to note that none of the girls could actually name any male reproductive organ. Although the topics related to reproductive organs were included in their textbooks but inspite of that a dismal picture prevailed. There was a huge gain in knowledge (over 40% at the time of post-testing), of the respondents pertaining to the names of male reproductive organs. Over 40 per cent of the experimental group girls could identify and name certain male reproductive organs, such as, testes (44.2%) and its function (43.3%), penis (46.7%) and its function (46.7%) and scrotum (25%) along with its functions (23.3%) during the period after intervention.

Control group respondents did not show increase in the knowledge about the female reproductive organs. Thus lack of knowledge with respect to male and female reproductive organs along with their functions was observed during the period of pretesting. Similar findings were noted from studies by Singh and Rathor[12] and Verma *et al*[13] where adolescent girls were less aware about male and female reproductive organs. A study by Shankar *et al*[14] reported that over 80 percent of the adolescent girls were unaware of the appearance of secondary sexual characteristics in both the genders

Table 4. Distribution of adolescent girls on the basis of their knowledge of primary and secondary sex characteristics during adolescence before and after intervention

Responses	Respondents							
	Exp (n=120)				Con (n=120)			
	Pre		Post*		Pre		Post	
	F	P	F	P	F	P	F	P
Primary sex characteristics								
Changes in male reproductive organs	0	0	65	54.2	0	0	0	0
Changes in female reproductive organs	0	0	101	84.2	0	0	0	0
Secondary sex characteristics								
Appearance of moustache in boys	0	0	75	62.5	0	0	0	0
Appearance of beard in boys	0	0	86	71.7	0	0	0	0
Appearance of under-arm hair in boys	0	0	47	39.2	0	0	0	0
Appearance of pubic hair in boys	0	0	40	33.3	0	0	0	0
Appearance of under-arm hair in girls	0	0	70	58.3	0	0	0	0
Appearance of pubic hair in girls	0	0	47	39.2	0	0	0	0
Breast development in girls	0	0	57	47.5	0	0	0	0

Respondents were asked about the primary and secondary sex characteristics / changes occurring during adolescence in boys and girls and the data pertaining to this have been presented in Table 4. It was shocking to see that none of the respondents among experimental and control groups could name a single primary or secondary sex characteristic, even simple characteristics like appearance of moustache or beard in boys was also not known to them. The most interesting fact was that all the girls were in the stage of adolescence and were experiencing such changes, still none of them perceived those changes as primary or secondary sex characteristics.

The education given to them during intervention showed a gain in knowledge in all the aspects among the experimental group. Majority of them became aware about primary sex characteristics, during post-testing, as changes in female reproductive organs (84.2%) that is uterus, ovaries and vagina and changes in male reproductive organs of testes, penis and scrotum

(54.2%). The secondary sex characteristics known to them during post testing were appearance of beard in boys (71.7%), appearance of under arm hair in girls (58.3%), appearance of moustache in boys (62.5%), breast development in girls (47.5%), appearance of pubic hair in girls (39.2%) and in boys (33.3%). A study by Hunshal*et al*[15] concluded that intervention programme benefited the adolescent girls in terms of gain in proper knowledge about pubertal changes and reproductive system.

Table 5. Distribution of respondents on the basis of awareness of external changes occurring during puberty in boys and girls before and after intervention

Responses	Respondents (N= 240)							
	Exp (n=120)				Con (n=120)			
	Pre*		Post*		Pre*		Post	
	F	P	F	P	F	P	F	P
Girls								
Increase in height	36	30.0	75	62.5	52	43.3	54	45.0
Changes in weight	16	13.3	64	53.3	4	3.3	10	8.3
Changes in breast proportions	14	11.6	50	41.7	8	6.7	8	6.7
Changes in body proportions	2	1.6	41	34.2	1	0.8	1	0.8
Being slim	8	6.6	33	27.5	13	10.8	13	10.8
Other changes (hair in other body parts)	14	11.6	79	65.8	12	10.0	11	9.2
Menarche	15	12.5	72	60	16	13.3	20	16.7
Difference in facial appearance /skin changes	15	12.5	38	31.7	11	9.2	13	10.8
No knowledge	84	70.0	45	37.5	68	56.6	66	55.0
Boys								
Increase in height	30	25.0	48	40.0	28	23.3	30	25.0
Changes in weight	8	6.6	40	33.3	3	2.5	4	3.3
Changes in voice	17	14.1	46	38.3	11	9.2	14	11.7
Appearance of moustache &beard	20	16.6	56	46.7	22	18.3	28	23.3
Other changes (hair in other body parts)	3	2.5	73	60.8	5	4.2	6	5.0
Broadening of chest & shoulders	3	2.5	80	66.7	2	1.7	13	10.8
No knowledge	90	75.0	40	33.3	92	76.6	90	75.0

A lot of improvement was seen among the experimental group participants in rural during post testing which was due to the interactive educative sessions during the intervention period. Increase in responses was seen in all categories of awareness of changes occurring in boys during puberty and the highest among them was in the response of broadening of chest and shoulders (2.5% at pre-test to 66.7% at post-test) followed by other changes (2.5% at pre-test to 60.8% during post-testing) and changes in weight (6.6% at pre-test to 33.3% at post-test). More percentage of girls were aware of the changes like increase in height, voice changes and appearance of moustache and beard. Deshmukh *et al*[16]also noticed significant improvement in knowledge about physical changes in their study on determining effectiveness of a health education intervention programme in adolescent girls.According to the findings of a study on awareness regarding pubertal changes in school going adolescent girls, the most common knowledge perceived by one third of girls were growth of pubic hair, increase in weight and height and menarche[17]. Post testing showed a sharp increase in awareness pertaining to all major changes occurring in girls during puberty among experimental group while not much difference in responses was seen among control group girls. More percentage of girls knew about the changes like increase in height, weight differences, changes in breast and body proportions, occurrence of menarche as well as other changes.

External bodily changes during any phase of life, especially during adolescence, are easier to observe than the internal ones. Certain peculiar changes like increase in height or weight during puberty are most likely to be perceived and should be known to the people of that cohort. However, it was surprising to note that simple variations in height and weight, occurrence of menarche as external change during puberty in girls was not known to the respondents. This suggests a clear ignorance on the part of these youngsters for not realizing important changes in themselves. The findings of the present study are supported by results of a research on knowledge and information in psychological and physiological problems among adolescent school girls who concluded that adolescent girls had poor knowledge on puberty and the pubertal problems[17]. Sandhya and Panthee[5] in their study on awareness and attitude on pubertal changes among adolescents in Nepal also revealed unfavorable attitudes and knowledge regarding changes occurring during puberty and negative attitude towards changes in terms of fear, sadness, etc.

Table 6.Awareness of girls regarding internal changes occurring among girls and boys during puberty before and after intervention

Responses	Rural (N = 240)							
	Exp (n=120)				Con (n=120)			
	Pre*		Post*		Pre		Post*	
	F	P	F	P	F	P	F	P
Girls								
Maturation of organs	0	0	23	19.2	0	0	0	0
Aggression	2	1.7	25	20.8	0	0	0	0
Emotional changes	4	3.3	28	23.3	1	0.8	1	0.8
Interest in boys	4	3.3	18	15	1	0.8	1	0.8
Interest in fashion	1	0.8	18	15.0	1	0.8	1	0.8
Increase in mature thinking	10	8.3	67	55.8	2	1.7	8	6.7
No knowledge	110	91.7	84	70.0	115	95.8	113	94.2
Boys								
Maturation of organs	0	0	25	20.8	0	0	1	0.8
Aggression	1	0.8	33	27.5	0	0	4	3.3
Emotional changes	1	0.8	11	9.2	0	0	4	3.3
Interest in girls/ affairs	5	4.2	44	36.7	0	0	4	3.3
Interest in fashion	0	0	0	0	0	0	0	0
Increase in mature thinking	7	5.8	40	33.3	2	1.7	6	5.0
No knowledge	115	95.8	76	63.3	118	98.3	114	95.0

Table 6 provides details of distribution of respondents according to their knowledge of various internal changes occurring among boys and girls during puberty. It was observed that more than 90 per cent of the respondents in experimental and control groups (91.7% and 95.8%) did not know anything about the internal changes occurring during adolescence in girls. Only 8.3 percent of girls in experimental group were aware of the increase in knowledge / mature things in girls as internal changes at the time of pre-test. An equal percentage of experimental group (3.3%) and control group (0.8%) in rural areas felt that emotional changes among adolescent girls and boys was something that happened internally. This lack of knowledge pertaining to emotional changes on the part of girls of the present study are validated by a study of Jain *et all*[18] who found that only seven percent of adolescent school going girls were aware of any kind of emotional changes occurring during the period of adolescence. Internal changes during adolescence are difficult to observe but one can always feel the changes in mood or emotions. The most obvious change that can be felt is the emotional variations occurring in the form of

mood changes or increase in aggression or anger. If persons are sensitive towards themselves, the changes can be felt by them. On the whole, it was seen that respondents in the present study were less aware of the internal changes in boys during adolescence than in girls, which was obvious as they must have felt some of the changes within themselves. The present findings are in congruence with results of a study by Abajobir and Seme[19] which concluded that most of the rural adolescents did not know about the changes taking place in boys and girls during puberty.

Table 7. Perception of girls on behavioural changes of the family members during adolescence

Responses	Rural			
	Exp (n=120)*		Con (n=120) *	
	F	P	F	P
Restriction in overall movement	8	6.6	26	21.6
Not allowed to play	46	38.3	3	2.5
Don't let go alone /don't let go anybody's house	16	13.3	21	17.5
Planning about marriage	11	9.2	4	3.3
More household responsibilities	8	6.6	8	6.6
Expects to take care of siblings	0	0	0	0
Understands our behaviour	13	10.8	6	5.0
No knowledge	50	41.6	77	64.1

Table 7 depicts the distribution of respondents according to their perception on behavioural changes of their family members during the period of adolescence across the two settings. It can be seen that majority of the respondents in experimental and control groups (41.6% and 64.1%) did not have any knowledge on this aspect. Respondents perceived many behavioural changes, especially in their parents, during their process of 'growing up.' More percentage of girls in the experimental group (38.3%) were not allowed to play than the control group (2.5%) while respondents in the control group complained more of restrictions outside their house (21.6%) and were not allowed to go alone or sleep alone (17.5% as against 13.3% experimental group girls). An equal percentage of respondents in both groups (6.6%) expressed an increase in sharing of household work or responsibilities while a little less than on tenth of them realized that their parents took more care of them ("*dhyandetehain*") and understood their changing behaviour. Respondents also felt that their parents have started to discuss about their marriages (9.1%: experiment and 3.3%: control group). It is clear that respondents definitely felt a change in the

behaviour of parents during the adolescence years, especially after their menarche, and were expected to behave like mature adults.Certain issues like security, marriage, restrictions on movements outside home were seen. As can be seen from the perception of the girls, parents were more concerned about these aspects. This may be because of the concern on the safety of girls and women in the rural areas as the young girls are more vulnerable to various kinds of atrocities.

Table 8. Difference in mean scores of puberty related knowledge of rural and tribal respondents before and after intervention

Area	Groups	No.	Mean	SD	t cal	P
Rural region						
Puberty related knowledge scores	Pre Experimental	60	6.53	5.61	35.55**	0.000
	Post Experimental	60	29.93	7.61		
	Pre Control	60	5.45	4.48	0.56 NS	0.570
	Post Control	60	5.55	4.16		

** Highly Significant NS Non Significant

Table 8 depicts the statistical difference in mean scores of experimental and control groups. The mean scores related to knowledge of puberty aspects of both groups were calculated before and after intervention and it can be observed that there was a highly significant difference between the respondents of experimental group before and after intervention (t cal= 35.55; p = 0.000).Thus the adolescent girls of the experimental groups were able to identify the various external and internal changes during adolescence, name the male and female reproductive organs and related aspects of puberty after the intervention. The findings of the present study is supported by results of a study done by Deshmukh *et al*[16]and Sandhya and Panthee[5]who found poor pretest knowledge among adolescents regarding growing up which improved significantly after the intervention. This validates the point that if a better understanding of the changes occurring during puberty is developed, it will help in laying good foundation for the reproductive health, especially for girls[20]. Also a review study by Bhanu and Anuradha[21] revealed that adolescent girls should be equipped with the right information regarding pubertal changes, which would eventually leads to better reproductive health as well as future motherhood.

Conclusion

Adolescent years are one of the most important years of life and poses significant challenges in the lives of boys and girls, specifically more on girls due to the societal and cultural expectations. Puberty is one of the central aspects of this phase as it facilitates the adolescent to move into the world of adulthood. In Indian societies, especially in villages, the discussion about pubertal changes are generally not done which results into unawareness about the changes taking place in their body and the reasons of these changes. In addition, chapter on adolescence in school curriculum is skipped by the teachers in the schools also due to embarrassment among teachers to discuss these issues openly. This leads to lack of knowledge among girls and boys. The present study concluded lack of knowledge on changes during puberty and restrictions on the adolescent girls. Educational intervention provided to the adolescent girls in the schools brought a significant change in knowledge and attitude and thus contributed in terms of better understanding of their bodies and laid implications for their future health.

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