

Original Article

Awareness and Attitude on Pubertal Changes among Community Adolescents**Pandit Sandhya, RN, MSN**

Lecturer, B & B Medical Institute (Nursing College), Gwarko, Lalitpur, Nepal

Panthee Bimala, RN, MSN, PHD

Assistant Professor, Patan Academy of Health Sciences, School of Nursing and Midwifery, Lalitpur Nursing Campus, Sanepa, Nepal

Research and Development Center, Nepal, Program Manager, Health and Nutrition, Maitrinagar, Kathmandu, Nepal

Correspondence: Bimala Panthee, Assistant Professor, Patan Academy of Health Sciences, School of Nursing and Midwifery, Lalitpur Nursing Campus, Sanepa, Nepal. Research and Development Center, Nepal, Program manager, Health and Nutrition, GPO Box 9804, Kirtipur-2, Maitrinagar, Kathmandu, Nepal.

E-mail: bimupanthee@gmail.com

Abstract**Background:** Adolescence is the critical transition period of life span characterized by onset of puberty. Physical and psychological changes during puberty contribute the adolescents to suffer from anxiety, depression, substance use disorders etc.**Objective:** This study aimed to assess awareness and attitude towards pubertal changes among adolescents.**Research method:** A descriptive cross-sectional study design was applied. Purposive sampling technique was used to select 205 adolescents. Data was collected using semi-structured interview schedule questionnaire. Analysis was done using descriptive and inferential statistics with SPSS version 20. Test of significance was set at .05 level.**Results:** Findings showed that 16% adolescents had very good level of awareness, 47% had good level of awareness, 28% had average level of awareness and 9% had below average level of awareness regarding pubertal changes. However only 11% of the adolescents showed moderately favorable attitude, while 89% showed unfavorable attitude towards pubertal changes. There was significant difference in the level of awareness according to age and education ($p < .05$). Similarly, significant difference was found in the attitude according to gender, type of family, education, father's education, and having immediate elder siblings ($p < .05$). The awareness and attitudes were significantly negatively correlated ($r = -.19$).**Conclusion:** In conclusion, three-fourth of the adolescents had average to good level of awareness but majority of respondents had unfavorable attitude towards pubertal changes. Thus there is a need for attitude promoting awareness program regarding pubertal changes among adolescents to help them prevent from stress, anxiety, frustration and depression associated with pubertal changes.**Key words:** Adolescents, Attitude, Awareness, Pubertal changes**Background**

Adolescence is the critical transition period of life span characterized by onset of puberty between 10 and 19 years of age (World Health Organization, 2017). About 1.2 billion adolescents today make up 18% of the world's population among them more than half of all adolescents live in Asia (United Nations Children's Emergency Fund, 2012). In Nepal, adolescents comprise 24.18% of

the total population (Central Bureau of Statistics, 2011). Hormonal changes lead to onset of puberty characterized by rapid physical growth and development of secondary sexual characteristics (University of Maryland Medical Center, 2016; Steinberg, 2008).

Thus, changes during puberty are not only physical, but also, physiological, psychological, social, emotional, cognitive, and behavioral

(UMMC, 2016; WHO, 2016). Regarding physiological changes; breast budding, rapid increase in height and weight, growth of pubic and axillary hair, widening of the hip, onset of menstruation in girls. Similarly, voice changes, increase in width of the shoulders, night time ejaculation, enlargement of penis, growth of axillary hair, facial hair in boys (Ghai, Gupt, & Paul, 2004). Regarding psychological changes; adolescents are uncertain in their emotional state, they are enthusiastic at one minute and depressed & withdrawn in next minute and social changes are searching for identity, seeking for independence, starting an intimate relationship are prominent in both girls and boys.

Previous researches revealed that the pubertal changes affect adolescents' self-image, mood and interaction with parents and peers. The changes make them confused, vulnerable and egocentric (Berk, 2007). Mental disorders such as major depression, anxiety disorders, eating disorders, and substance use disorders are common during adolescence (Reena, 2015). Similarly, more than 50% of female adolescents had mild to severe stress due to pubertal changes (Rawat, Sagar, & Khadka, 2015).

Regarding pubertal changes 38% of adolescents in India reported nocturnal emission as a natural process and 11% reported that it is harmful to body and related to disease and 10% reported that masturbation leads to impotency (Singh, Singh, & Singh, 2014). Similarly, in Nepal, 47% of adolescent boys reported nocturnal emission as normal, about 30% reported as enjoyment, and 30% were shock. Likewise about menarche, 21% of adolescent girls feared, 33% reported as normal and nearly half (47%) felt uneasiness and discomfort (Paudel & Paudel, 2014). Furthermore, about 50% of boys and girls were apprehensive when hair started to grow around their private parts 20% felt good and another 20% felt very happy (Sharma, 2007).

A cross sectional study conducted in India found that only 10% and 20% (girls and boys, respectively) had correct knowledge on secondary sex characteristics (Dorle et al. 2010). Similarly, another study showed that 66% of adolescents were aware of physical changes, only 17% were aware of emotional changes and 9% adolescent

were not aware of either physical and emotional changes (Jain, Kumar, & Khanna, 2013). In addition, knowledge regarding menstruation among Nepalese adolescent girls was very low (6%) (Adhikari et al. 2007).

Thus, biological determinants during adolescence are fairly universal. In order to effectively deal with this transition, adolescents need to be aware of their bodily changes to make their life easy and productive (Khan, 2000). Lack of awareness on pubertal changes lead to unfavorable attitude towards their own bodily changes resulting in different negative outcomes (Sharma, 2007). Thus, we intended to find out awareness and attitude regarding pubertal changes among both boys and girls in community setting. Furthermore, we aimed to examine the association between demographic variables and awareness and attitude level towards pubertal changes. In addition we aimed to compute the relationship between awareness and attitude on pubertal changes.

In this study we defined "awareness" as the adolescents' understanding regarding concept of puberty, physiological and psychological changes during puberty. It was measured by self-developed awareness related questionnaire with multiple choice and multiple response questions.

Similarly "attitude" was defined as the adolescent's feelings or opinion or reaction to respond to pubertal changes. It was measured by self-developed attitude related questionnaire in a 5 point Likert scale.

Research methodology

Research design: Descriptive cross-sectional design was adopted to select 205 adolescents who were in between the age 13 years and 19 years.

Setting: The study was conducted in Bharatpur Sub-Metropolitan City. It is located in central-southern part of Nepal & is the fifth largest city of Nepal with the total adolescents' population of 46,572, where, 22,471 were boys and 24,101 were girls (CBS, 2011).

Sample Size: The sample size was determined using the formula below, $n = z^2pq / e^2$ (Cochran, 1977). Using the prevalence of knowledge (86%) regarding pubertal changes among adolescents girls (Sanghi et al. 2015) the expected sample was

185. However assuming a non-response rate of 10% of total population, sample size of the study was 205.

Sampling Technique: Non- probability purposive sampling technique was used. From each household one adolescent if available was selected until sample size was fulfilled i.e. 205 of ward number 10 of Bharatpur Sub-Metropolitan City.

Research Instrumentation: Structured interview schedule questionnaire was developed on the basis of extensive review of literature and consultations with experts to identify awareness and attitude regarding pubertal changes. The research instrument consisted of three parts: Part I was related to demographic characteristics (age, gender, ethnicity, religion, education of respondents, and education of father/mother, family type and occupation of father/mother). Part II included questions related to awareness on pubertal changes. In addition to awareness related questions, the actual experiences of pubertal changes and reactions about those changes was also asked to the adolescents. Part III included attitude regarding pubertal changes including twelve items. The instrument was first developed in English language. Then, it was translated to Nepali. Again, it was back translated to English to ensure that the meaning was retained. We used Nepali version for data collection.

Scoring Criteria: Awareness related questionnaire consisted of 15 questions where both multiple choice and multiple responses options were included. Each right answer of multiple choice and multiple response questions was scored 1. Total score ranged between 0-29. It was converted into percentage to categorize the level as; below average of awareness: score less than 15 (< 50%), average awareness: score between 15 and 18 (50-60%), good awareness: score between 18 and 22 (60-75%), and very good awareness: Score more than 22 (> 75%) (Rani, Sheoran, & Kumar, 2016).

Attitude related questionnaire consisted of 12 statements in a 5 point Likert scale 1 (strongly disagree) to 5 (Strongly agree). Negatively phrased items were recoded. The score ranged between 0-60. It was converted into percentage to categorize the level as; unfavorable attitude: score less than 30 (< 50%), moderately favorable attitude: score between 30 to 45 (50-75%), and favorable attitude:

score more than 45 (> 75%) (Rani, Sheoran, & Kumar, 2016).

Validity and reliability of the instrument: The content validity of the instrument was established by consultation with three external subject matter experts (>80% rating score for content validity) was included. For reliability of the instrument, pre-testing of the instrument was done among 21 adolescent girls in similar setting. Necessary modifications were done after its result. Reliability of the instrument was tested using Cronbach's alpha coefficient for attitude related statements and Split-Half method was used for awareness related questionnaire which gave satisfactory value of .70 and .74, respectively.

Ethical approval: Data was collected after getting ethical approval from Institutional Review Board of Tribhuvan University, Institute of Medicine.

Data collection procedure: Door-to-door home visit was done for data collection. Prior to data collection, purpose of the study was explained and verbal and written consent was obtained from adolescent's parents and verbal consent was also obtained from adolescents. Data was collected through face-to-face interview technique by using structured interview schedule.

Data Analysis Procedure: Collected data were entered into statistical Package for the Social Sciences (SPSS) version 20. The data was analyzed by using descriptive statistics. Inferential statistics such as chi-square test, Pearson correlation coefficient was used according to the nature of data. P value was set at .05.

Results

The mean age of the respondents was 15 years. More than 50% of respondents belonged to the age group 15-19 years. About 53% of respondents were female. Forty four percent of respondents had lower secondary education and only 16% had higher secondary education. Twenty six percent of respondents' father had bachelor and above degree education and 45% of respondents' mother had secondary level education (Table 1). Regarding the level of awareness, 47% had very good awareness on pubertal changes (Table 2). However, 89% had unfavorable attitude towards pubertal changes (Table 2). Regarding the factors associated with awareness level we found significant differences

between age, education of respondents and awareness of pubertal changes. Adolescents between age of 15 and 19 were more aware towards pubertal changes (Table 3). Similarly respondents who had secondary and above

education were more aware on pubertal changes (Table 3). Analyzing the relationship between attitude and awareness level we found significant negative association $r = -.18, p < .01$.

Table 1 Demographic characteristics of adolescents (N=205)

Characteristics	Number	Percentage
Age (in years)	15.07±1.60	
13-15	88	42.9
16-19	117	57.1
Education (respondents)		
Lower secondary	91	44.4
Secondary	80	39.0
Higher secondary	34	16.6
Education (father) n = 204		
Information education	18	8.8
Primary	9	4.4
Lower secondary	16	7.8
Secondary	46	22.6
Higher secondary	62	30.4
Bachelor and above	53	26.0
Education (mother) n = 191		
Informal education	18	9.4
Primary	9	4.7
Lower secondary	17	8.9
Secondary	87	45.6
Higher secondary	38	19.9
Bachelor and above	22	11.5
Elder siblings		
Yes	109	53.2
No	96	46.8
Type of family		
Nuclear	143	69.8
Joint	55	26.8
Extended	7	3.4

Table 2 Awareness and attitude of adolescents towards pubertal changes (N=205)

Characteristics	Number	Percentage
Awareness level		8.8
Below average	18	28.3
Average	58	47.3
Good	97	15.6
Very good	32	
Mean score \pm SD = 63.89 \pm 10.73		
Range = 37.93 - 93.10 (in scale of percentage)		
Attitude		
Unfavorable	183	89.3
Moderately favorable	22	10.7
Favorable	-	-
Mean Score \pm SD = 38.71 \pm 7.78		
Range = 26.67-65.00 (in scale of percentage)		

Table 3 Association of demographic variables with level of awareness towards pubertal changes (N=205)

Characteristics	Level of awareness				Chi square	P value
	Below average N (%)	Average N (%)	Good N (%)	Very good N (%)		
Age in years						
13-15	14(6.8)	29(14.2)	39(19.0)	6(2.9)	18.04	<.001
15-19	4(2.0)	29(14.2)	58 (28.3)	26(12.7)		
Gender						
Boys	8(3.9)	27(13.2)	44 (21.5)	18 (8.8)	1.25	0.74
Girls	10(4.9)	31(15.1)	53(25.9)	14(6.8)		
Family type						
Nuclear	10(4.9)	42 (20.5)	66 (32.2)	25(12.2)	3.11	0.38
Joint	8(3.9)	16(7.8)	31(15.1)	7(3.4)		
Education (respondents)						
Below secondary	14(6.8)	27 (13.2)	39 (19.0)	11(5.4)	10.23	0.02
Secondary and above	4(2.0)	31(15.1)	58 (28.3)	21(10.2)		
Education (Father) (n=204)						
Below secondary	7 (3.4)	13 (6.4)	14 (6.9)	9 (4.4)	6.88	.08
Secondary and above	11 (5.4)	45 (22.1)	82 (40.2)	23 (11.3)		
Education (mother) (n=191)						
Below secondary	5 (2.6)	16 (8.4)	17 (8.9)	6 (3.2)	2.71	0.44
Secondary and above	11 (5.8)	42 (22.0)	77 (40.3)	17 (8.9)		
Immediate elder sibling					2.12	0.55
Yes	10 (4.9)	32 (15.6)	47 (22.9)	20 (9.8)		
No	8 (3.9)	26 (12.7)	50 (24.4)	12 (5.9)		

P value significant at <.05

Table 4 Association of demographic variables with attitude of adolescents towards pubertal changes (N=205)

Characteristics	Attitude		Chi-square	P value
	Unfavorable N (%)	Moderately favorable N (%)		
Age in years	78 (38.1)	10 (4.9)	0.64	0.80
13-15	105 (51.2)	12 (5.9)		
15-19				
Gender				
Boys	80 (39.0)	17 (8.3)	8.87	<.001
Girls	103 (50.2)	5 (2.4)		
Family type				<.001
Nuclear	135 (65.9)	8 (3.9)	13.03	
Joint	48 (23.40)	14 (6.8)		
Education (respondent)				
Lower secondary	77 (37.6)	14 (6.8)	3.70	.05
Secondary and above	106 (51.7)	8 (3.9)		
Education (father) n = 204				
Below secondary	33 (16.2)	10 (4.9)	8.81	<.001
Secondary and above	149 (73.0)	12 (5.9)		
Education (mother) n=191				
Below secondary	37 (19.4)	16 (7.8)	3.79	.05
Secondary and above	90 (43.9)	6 (2.9)		
Immediate elder siblings				
Yes	93 (45.4)	16 (7.8)	3.79	.05
No	90 (43.9)	6 (2.9)		

Note: P value significant at <.05

Regarding attitude, gender, education of father, mother. Immediate elder siblings, family type all affected on favorable attitude. For instance, those adolescents who had immediate elder siblings had more favorable attitude than those who do not have, similarly boys had more favorable attitude than girls (Table 4).

Discussion

A descriptive cross sectional study was carried out to identify awareness and attitude regarding pubertal changes among adolescents. All the adolescents were literate, where 44.39% were of lower secondary level which includes grade 6th, 7th and 8th. Regarding mother's education, 93.17% were literate whereas almost all (99.51%) fathers were literate.

Regarding the awareness level we found that 63% of adolescents had good to very good level of

awareness. It might be because of the age group of the adolescents, where most of the adolescents belonged to the age group of 15-19 years. Most of the boys and girls might have experienced either of their pubertal changes in this age group (Daskeo, 2011). Also education might play the role for higher awareness level in this study group. Likewise, more than 90% of parents were literate. In previous study 85.8% of adolescent girls had moderate knowledge (score ranged between 50% and 75%) (Saghi et al. 2015). In contrast with this study it was found that only 1% pre-adolescent boys and girls had good knowledge and none of them had very good knowledge on pubertal changes (Rani et al. 2016). Thus, it shows that when the age increases adolescents become more aware towards pubertal changes.

Regarding attitude towards pubertal changes we found that only 11% of the adolescents had

moderately favorable attitude and none of the adolescents showed favorable attitude towards pubertal changes. It might be due to unpleasant and undesirable feelings about the pubertal changes occur on them. Present study showed that about 95% of boys and 94% girls experienced hair growth in pubic area and when relating with their reactions, about 40% boys and 41 % girls felt shy, about 4% boys and 16% girls were scared, 5% boys and 14% girls felt sad, when pubic hair appeared on them, which might lead adolescents towards unfavorable attitude on pubertal changes. This finding contradicts with the findings of Saghi et al. (2015), where 90% of the adolescent girls had positive attitude regarding pubertal changes similarly, Rani, Sheoran, & Kumar, (2016) also found moderately favorable attitude among pre adolescents.

We also asked about the pubertal changes occurred to adolescents themselves and their own reaction towards those changes. We found that 67% boys and 61% girls experienced acne on face, when relating it to their reactions, about 43% boys and 71% girls felt sad, 12% boys and 10% girls were scared and 14.29% boys and 6% of girls felt shy, which also might lead adolescents towards unfavorable attitude on pubertal changes. Similarly, about 80% of the boys and 60% of the girls experienced voice changes on them, when relating it to their reactions, 13.4% of boys and 2.35% of girls felt sad, 10.31% boys and 5.88% girls felt scared and 9.28% boys and 7% girls felt shy.

About 86% of the boys experienced growth of facial hair on them, where about 17% and 7% of boys felt shy and sad, respectively. About 94% of the girls experienced breast-budding, where 57% felt shy, 12% were scared and 4% felt sad, when breast-budding occurred on them, which also might lead adolescents towards unfavorable attitude on pubertal changes. About 97% girls experienced menarche on them, where about 69% were scared, about 15% felt shy and 5% felt sad, when menarche happened to them. And regarding wet dreams on boys, 42% boys experienced wet dreams (nocturnal emission), where 29% were scared, 7% felt shy and about 5% felt sad, when nocturnal emission occurred on them, which also might lead adolescents towards unfavorable attitude on pubertal changes. All, the unpleasant

and undesirable feelings towards different pubertal changes in this study might suggest the strong reason for the unfavorable attitude among adolescents.

Regarding the association between different demographic variables and awareness we found that there was significant difference in awareness level according to age ($\chi^2 = 18.04$, $p = .00$) (Table 3). This findings is supported by the findings of Alosaimi, (2014) which also showed that the knowledge level significantly increases with the increase in age. Similarly, there was significant difference in awareness level according to education of respondents ($\chi^2 = 10.23$, $p = .02$) (Table 3). This findings is also supported by previous study which showed that level of awareness increased with the increment of education level (Alosaimi, 2014).

Regarding the association of demographic variables towards attitude on pubertal changes, we found that there was significant difference in attitude according to gender ($\chi^2 = 8.87$, $p = .00$) (Table 4) where male had more favorable attitude than female adolescents. It is similar to the findings in Indonesian adolescents (Susanto et al. 2016). Likewise significant difference was found according to type of the family ($\chi^2 = 13.03$, $p=.00$) (Table 5). Where, adolescents who belonged to joint family had moderately favorable attitude than those who belonged to nuclear family. Furthermore, adolescent, who had immediate elder siblings has more favorable attitude ($\chi^2 = 3.79$, $p=.05$) (Table 4).

Regarding the relationship between awareness and attitude we found significant negative association ($r = .187$). This result is in contradict with previous studies (Fetohy, 2007; Saghi et al. 2015; Alosaimi, 2014). The negative relationship between awareness and attitude might be due to the representation of adolescents from conservative families, or may be due to shy nature and over protection to the adolescents (Deshmukh, Kulkarni, & Apte, 2014). The present study also demonstrates that many adolescents of the study have unpleasant and undesirable feelings towards pubertal changes. These findings are similar to previous study where knowledge and attitude were negatively correlated though not significant ($r = -.103$) (Rani, Sheoran, & Kumar, 2016),

We further analyzed each sub dimension of awareness related questionnaire. For instance, concept of puberty, secondary sexual characteristics, and psychological changes during puberty. Concept about Puberty includes questionnaire related to meaning of puberty, reason of pubertal changes, expected age of menarche in girls, meaning of menstruation and awareness on masturbation. Likewise Changes about Secondary Sexual Characteristics includes questionnaire related to first visible pubertal signs in girls and boys and common pubertal changes in girls and boys. Psychological Changes includes questionnaire related to psychological changes among adolescents.

Present study showed that most of adolescents (80 %) were aware about meaning of puberty as all the adolescents were literate and might have gained knowledge from textbooks in school about puberty. More than half (53.17%) adolescents had awareness about reason of pubertal changes which is due to increase in sex hormones. Regarding expected age of menarche in girls, all adolescents answered correctly (within 9-16 years). Regarding meaning of menstruation, three-fourth of the adolescents (75.6%) were aware that, it is regular monthly bleeding from vagina, while it contradicts with the findings of the study in Nepal which showed only 36 % had awareness about meaning of menstruation (Sapkota, 2014). Another study conducted by Ali et al. (2006) among Pakistani girls, where 68% were aware about meaning of menstruation. In sum, 68% of adolescents in this study had awareness on concept of puberty. This findings is contrast with the previous study conducted in India which found that only 28% of pre-adolescents were aware on concept of puberty (Rani, Sheoran, & Kumar, 2016).

Regarding common pubertal changes in girls, present study showed that 97.07% of the adolescents were aware about breast budding, which was inconsistent with previous finding where only 48 - 60% of adolescents' girls were aware about breast budding (Ray et al. 2011; Nair, Grover, & Kannan, 2007). Similarly, 93% adolescents were aware about onset of menstruation, while in previous study only 67% of adolescents were aware about onset of menstruation in India (Ray et al. 2011; Nair, Grover, & Kannan, 2007).

Regarding Rapid increase in height and weight in girls, 83% adolescent were aware on it which is similar to the study conducted in India where 83% were aware on it (Ray et al. 2011). In present study 81.95% adolescents had awareness regarding pubic and axillary hair growth while the study conducted by Ray et al. (2011) showed that only 60.87% were aware, and only 33.80% were aware about pubic hair growth as common pubertal changes in girls (Nair, Grover, & Kannan, 2007). This difference might be due to difference in country context and exposure of adolescents. Regarding common pubertal changes in boys, 87% of adolescents were aware that hoarseness of voice is one of the common pubertal changes in boys. In sum, overall awareness on common pubertal changes among adolescents was 67%.

Regarding psychological changes among adolescents, 88.78% adolescents were aware about attraction towards opposite gender as a psychological changes which contradicts with the study findings conducted by Ray et al. (2011), which showed only 30% of adolescents had awareness on attraction towards opposite gender as a psychological changes. Thirty four percent adolescents were anxious about their bodily changes, which is similar to the findings of Upadhyay-Dhungel et al. (2012), where 28 % adolescents' boys did not like the changes due to puberty. Thus, in sum, 56% of adolescent were aware regarding psychological changes which is almost similar with the previous study's findings of the where 43% preadolescents had awareness about psychological changes (Rani, Sheoran, & Kumar, 2016),

We further explored about the reaction towards pubertal changes that occurred to the adolescents. We found that most of the adolescent girl (69%) were scared, when they experienced first menstruation, which is somehow similar to the study of Venkatesh & Dhoundiyal, (2011), where 56% girls reported to be scared and sad during menarche. Findings is also supported by Sathe et al. (2016) which showed more than half of the adolescents girls experienced undesirable feelings during their first menstruation.

Regarding seeking help for pubertal changes, most of the adolescent girls seek help from mothers, as young girls usually propound her emotional and

psychological problems with her mother (Sapkota et al. 2014), where most of the adolescent boys seek help from friends. Similar findings were noted in the study of Nepal by Upadhyay-Dhungel et al. (2012) showed that adolescent boys were more comfortable in seeking help from friends rather than family and teachers about reproductive health problems. Another study by Singh et al. (2014) also showed that more than half of the teenager boys seek help with their friends for pubertal changes issues.

Regarding source of information, main source of information regarding pubertal changes of adolescent girls were friends, followed by mothers and for boys were friends followed by mass media (eg. TV, Internet, Magazines etc.). The study findings are similar to previous study conducted by Upadhyay-Dhungel et al. (2012) where most of adolescent boys got information regarding reproductive health by friends and magazines.

Conclusion

Based on the findings it can be concluded that three-fourth of the adolescents had average to good awareness toward pubertal changes. However, most of them had unfavorable attitude towards pubertal changes suggesting that adolescents in this study group are not accepting pubertal changes as normal. Also their negative reaction towards pubertal changes in terms of fear, sadness might signify of having many misconceptions and misbelieves regarding issues related to puberty in adolescence. Based on the findings of this study there is a need for attitude promoting awareness program regarding pubertal changes among adolescents to help them prevent from stress, anxiety, frustration and depression associated with pubertal changes

Limitations

The study was limited to single setting (ward) of the Bharatpur Sub-Metropolitan City, So, it will not represent the situation of the other wards and country as well. Non- probability purposive sampling technique was used for selection of sample. Hence, sampling selection bias might occur.

References

Adhikari P., Kandel B., Dhungel SI., Mandal A. (2007), Knowledge and practice regarding menstrual

- hygiene in rural adolescent girls of Nepal, Kathmandu University Medical Journal, 5(3): 382-6.
- Ali TS., Ali PA., Waheed H., Memon AA. (2006), Understanding of puberty and related health problems among female adolescents in Karachi, Pakistan, Journal-Pakistan Medical Association, 56(2): 68.
- Alosaimi JA. (2014), Saudi Intermediate School Girls' Knowledge, Attitudes and Practices of puberty in Tauf, Saudi Arabia, International Journal of Medical Science and Public Health, 3(2): 196-202.
- Berk LE. (2007), Development through the Life Span (4th ed.). Boston: Pearson Education
- Central Bureau of Statistics. (2012), National population census 2011 household and population by sex ward level. Retrieved from http://cbs.gov.np/image/data/Population/Ward%20Level/35Chitwan_WardLevel.pdf
- Cochran W. (1977), Sampling technique (3rd ed.), New York: John Wiley & Sons.
- Daskeo F. (2011), Changes in Boys and Girls during Puberty. Retrieved from <file:///C:/Users/HP/Desktop/2010-2011-2012/2011,%20Changes%20in%20Boys%20and%20Girls%20During%20Puberty.html>
- Deshmukh RV., Kulkarni AA., Apte SS. (2014), Knowledge and Attitude about Growing up Changes: An Intervention Study, Pediatric Oncall [serial online] Art 54, 11(3)
- Dorle AS., Hiremath LD., Mannapur BS., Ghattargi CH. (2010), Awareness regarding puberty changes in secondary school children of Bagalkot, Karnataka: A cross sectional study, Journal of Clinical and Diagnostic Research, 4: 3016-3019.
- Fetohy EM. (2007), Impact of a health education program for secondary school Saudi girls about menstruation at Riyadh city, J Egypt Public Health Assoc, 82(1): 105-126.
- Ghai OP., Gupt P., Paul VK. (2004), Essential Paediatrics (6th ed.). New Delhi: CBS
- Jain RB., Kumar A., Khanna P. (2013), Assessment of self-awareness among rural adolescents: A cross-sectional study, Indian Journal of Endocrinology and Metabolism, 17: S367-S372.
- Khan A. (2000), Adolescents and Reproductive Health in Pakistan: A Literature Review, Population Council final report.
- Nair P., Grover VL., Kannan AT. (2007), Awareness and practices of menstruation and pubertal changes amongst unmarried female adolescents in a rural area of East Delhi, Indian Journal of Community Medicine, 32(2): 156-7.
- Paudel DP. Paudel L. (2014), Perceived behavior and practices of adolescents on sexual and reproductive health and associated factors in Kathmandu,

- Nepal, Muller Journal of Medical Sciences and Research, 5(2): 106.
- Rani M., Sheoran P., & Kumar K. (2016), Knowledge and attitude regarding pubertal changes among preadolescents: A descriptive survey study, International Journal of Current Research, 8(06): 33697-33702.
- Rawat R., Sagar, R., Khakha DC. (2015), Puberty: A Stressful Phase of Transition for Girls, IOSR Journal of Nursing and Health Science, 4(5): 07-12.
- Ray K., Bhattacharjee S., Biswas R., Mukhopadhyay DK., Sarkar TK. (2011), Awareness regarding pubertal changes and reproductive health in school going adolescent girls of a border area of Darjeeling district: a cross sectional study, Indiana Journal of Maternal and Child Health, 13(3): 8.
- Reena M. (2015), Psychological Changes during Puberty-Adolescent School Girls, Universal Journal of Psychology, 3(3): 65-68.
- Saghi S., Mirghafourvand M., Alizadeh Charandabi SM., Nabighadim A., Seidi S., Rahmani A. (2015), Knowledge and attitude about pubertal health and their socio-demographic predictors in Iranian adolescents. International Journal of Adolescent Medicine and Health.
- Sapkota D., Sharma D., Pokharel HP., Budhathoki SS., Khanal VK. (2014), Knowledge and practices regarding menstruation among school going adolescents of rural Nepal, Journal of Kathmandu medical college, 2(3): 122-128.
- Sathe PP., Sathe PP., Kotnis SD., Mangulikar SK. (2016), Assessment of knowledge of reproductive health of adolescent school girls from 13-16 years with special reference to HIV-AIDS, International Journal of Community Medicine and Public Health, 3(1): 340-346.
- Sharma N. (2007), A study of social and psychological problems related to puberty among high school students, Journal of Institute of Medicine, 21: 1-50.
- Singh BP., Singh G., Singh KK. (2014), Pubertal Changes in Teenagers of Varanasi the Spiritual City of India, Indian Journal of Youth & Adolescent Health, 1(3): 1-5
- Steinberg L. (2008), Adolescence (8th ed.). McGraw-Hill, New York.
- Stoppler MC. (2016) Puberty: Stages & Signs for Boys and Girls. MedicineNet.com. Retrieved from <http://www.medicinenet.com/puberty/article.htm>
- Susanto T., Saito R., Kimura R., Tsuda A., Tabuchi N., Sugama J. (2016), Immaturity in puberty and negative attitudes toward reproductive health among Indonesian adolescents, International Journal of Adolescent Medicine and Health.
- United Nations Children's Emergency Fund, (2012), Children in an Urban World. Retrieved from http://www.unicef.org/sowc/files/SOWC_2012-Main_Report_EN_21Dec2011.pdf
- University of Maryland Medical Centre. (2016), Puberty and adolescence. Retrieved from <http://umm.edu/health/medical/ency/articles/puberty-and-adolescence>
- Upadhyay-Dhungel K., Dhungel BA., Das PKL., Karki BMS. (2013), Perception and Knowledge Regarding Reproductive Health among Adolescent Males of Lalitpur. Asian Journal of Medical Sciences, 3(3): 27-31.
- Venkatesh R., Dhoundiyal M. (2011), Perceptions and practices during menstruation among adolescent girls in and around Bangalore city. Indian Journal of Maternal and Child Health, 13(2): 1-7.
- World Health Organization. (2017), Maternal, newborn, child and adolescent health, Retrieved from http://www.who.int/maternal_child_adolescent/topic/s/adolescence/dev/en/