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EFFECT OF SLEEP PROMOTION EDUCATION ON SLEEP HYGIENE KNOWLEDGE, SLEEP BEHAVIOUR PRACTICE OF ADOLESCENTS IN SELECTED SCHOOLS OF BANKURA, WEST BENGAL, INDIA

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Abstract: **A quasi experimental study was adopted to assess the effect of sleep promotion education on sleep hygiene knowledge, sleep behavior practice of adolescents in selected Schools of Bankura, West Bengal. Non-probability Quota sampling technique was used to obtain 80 adolescents as the sample. Self-administered demographic questionnaire, structured knowledge questionnaire and ASHS (adolescent sleep hygiene scale) were used to collect data. The study findings revealed that sleep promotion education was effective to increase the sleep hygiene knowledge and sleep behavior practice of adolescents as evidenced from paired 't' value between pre-test and post-test knowledge score($t= 9.20, p<0.001$) and pre-test and post-test ASHS score in experimental group ($t= 7.30, p<0.001$) and independent 't' value between post-test knowledge score of experimental and control group($t =6.28, p<0.001$), post-test ASHS score of experimental and control group $t= 2.17, p<0.05$) .**

Index Terms **- Sleep promotion education, Sleep hygiene, Sleep behavior practice, Adolescents**

Introduction All over the world there are near about 1.2 billion adolescents among them 90% live in middle to low income countries whereas India is the resident of about 250 million adolescents of 10-19 years age group which comprises 20% of the total Indian Population. So maintenance of Adolescents health is crucial to achieving the country's Sustainable Developmental Goal.

Adolescence is a vital time of the life for normal growth and development which is characterized by initiation of puberty & physical maturation. Pubertal onset corresponds with the natural sleep shift of the adolescents which is predisposed to delay sleep wake cycle during this period.

The National Sleep Foundation recommended 8-10 hours of sleep per night for adolescents. A decrease in sleep hours and quality has an effect on mental and physical health of the adolescents. In recent years adolescent sleep pattern has changed that leads to reduction in sleep quality and quantity. Sleep disturbance during this period occurred due to poor sleep hygiene practice. Sleep hygiene is a various type of different practices which are necessary for normal quantity, good quality nighttime sleep and full daytime alertness.

Sleep hygiene practice are behaviour that an individual follows to facilitate good sleep health. These sleep practices include maintaining same sleep wake time regularly, limited caffeine, nicotine and alcohol use before bedtime, maintaining conducive environment for sleep.

A study conducted by Suri J.C, Sen M K, Adhikari T (2008) in Delhi showed that 47.6% of the School going children suffer from some form of sleep disorders.

Sleep disorders are not only risk factor for mental disorder but it is also one of the serious mental disorders. Evidences showed the linkage between poor sleep pattern and cardiovascular disease, stroke, diabetes, metabolic dysfunction.

So sleep promotion education is a gateway to encourage adolescence for adopting good sleep behaviour practices to promote mental and physical health.

Title:

EFFECT OF SLEEP PROMOTION EDUCATION ON SLEEP HYGIENE KNOWLEDGE AND SLEEP BEHAVIOUR PRACTICE OF ADOLESCENTS IN SELECTED SCHOOLS OF BANKURA, WEST BENGAL.

Objectives:

1. To assess the sleep hygiene knowledge before and after administration of sleep promotion education among adolescents.
2. To find out sleep behaviour practice before and after administration of sleep promotion education among adolescents.
3. To determine the effects of the sleep promotion education on sleep hygiene knowledge and sleep behaviour practice.
4. To identify relationship between sleep hygiene knowledge and sleep behaviour practice.
5. To find out association between sleep hygiene knowledge, sleep behaviour practice and selected demographic variables.

Conceptual Framework:

Conceptual framework used for this study was based on Karl Ludwig Von Bertalanffy General System Theory. The system model has three components-Input, Process and Output.

The adolescents and their background information such as age, gender, grade, birth order, no of siblings, type of family, monthly family income, father's educational status, mother's educational status, father's occupation, mother's occupation, family history of sleep disorders, baseline sleep hygiene knowledge and sleep behaviour practice were the input of the present study.

The study process comprised administration of sleep promotion education among adolescents.

Output was the end result in terms of changes in sleep hygiene knowledge and sleep behaviour practice score of the adolescents after administration of sleep promotion education. In this study it was measured by differences between pre and post test score. Feedback is the process through which output was returned to the system which was under the study.

Research Methodology:

A quasi experimental pre-test post-test control group design was conducted with 80 adolescent students of class IX and X standard out of which 40 students for experimental Group from Chaka Nirmalananda High (H.S.) School, Bankura, West Bengal and 40 for Control Group from Keshia High (H.S) School, Bankura, West Bengal. School was selected by simple random sampling technique and students were selected by non probability Quota Sampling from four quota. Demographic data were collected by Semi Structured Demographic tool and sleep hygiene knowledge of students were assessed by Structured Knowledge Questionnaire on Sleep Hygiene by paper and pencil. Sleep promotion education was administered in experimental group. Pretest and post test data were collected from both Experimental and Control group. Ethical clearance was taken from Institutional Ethical Committee of Bankura Sammilani Medical College, Bankura, W.B, informed consent from the participant. Confidentiality and privacy of the adolescents were maintained.

Reselts and Discussion

Table 1 Distribution of the adolescents according to their pre-test and post-test knowledge score in Experimental and Control Group.

n=80(n_E =40, n_C=40)

Knowledge Score	Range of score	Experimental Group				Control Group			
		Pre-test		Post-test		Pre-test		Post-test	
		F	%	f	%	f	%	f	%
Excellent	>16 (>80%)	2	5.0	18	45	2	5.0	2	5.0
Good	12-16 (60-80%)	17	42.5	20	50	13	32.5	15	37.5
Average	10-11 (50-59%)	11	27.5	2	5	18	45.0	17	42.5
Poor	<10 (<50%)	10	25.0	0	0	7	17.5	6	15.0

Maximum possible Score is 20
Minimum possible score is 0

Data depicted table 5 indicated that in experimental group maximum (42.5%) adolescents scored good and minimum (5%) scored excellent in pre-test where as in post-test 45% scored excellent and maximum (50%) adolescents scored good.

Data also revealed that in control group maximum adolescents scored average both in pre-test (45%) and post-test (42.5%).

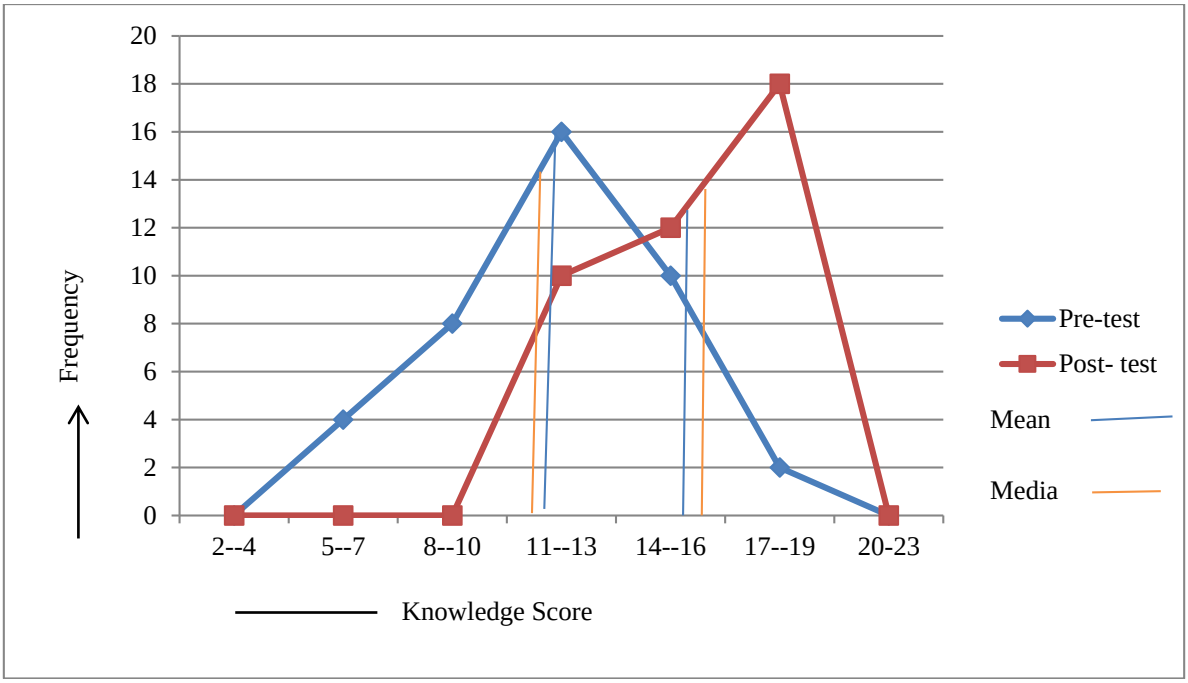

Fig.1 Comparison between pre-test and post-test knowledge scores of adolescents in experimental group

The frequency polygon in figure 1 showed that the pre-test knowledge score range was from 5-17 with mean 11.5± 3.07 and median 11. The post-test knowledge score range was from 11 to 19 with mean 15.65± 2.28 and median 16.

In experimental group pre-test knowledge was positively skewed and skewness was 0.49 and post-test knowledge score was negatively skewed and skewness was -0.46. The values of skewness were negligible indicating score were almost normally distributed. The figure also indicated that mean post-test knowledge score was apparently higher than mean pretest knowledge score of adolescent in experimental group.

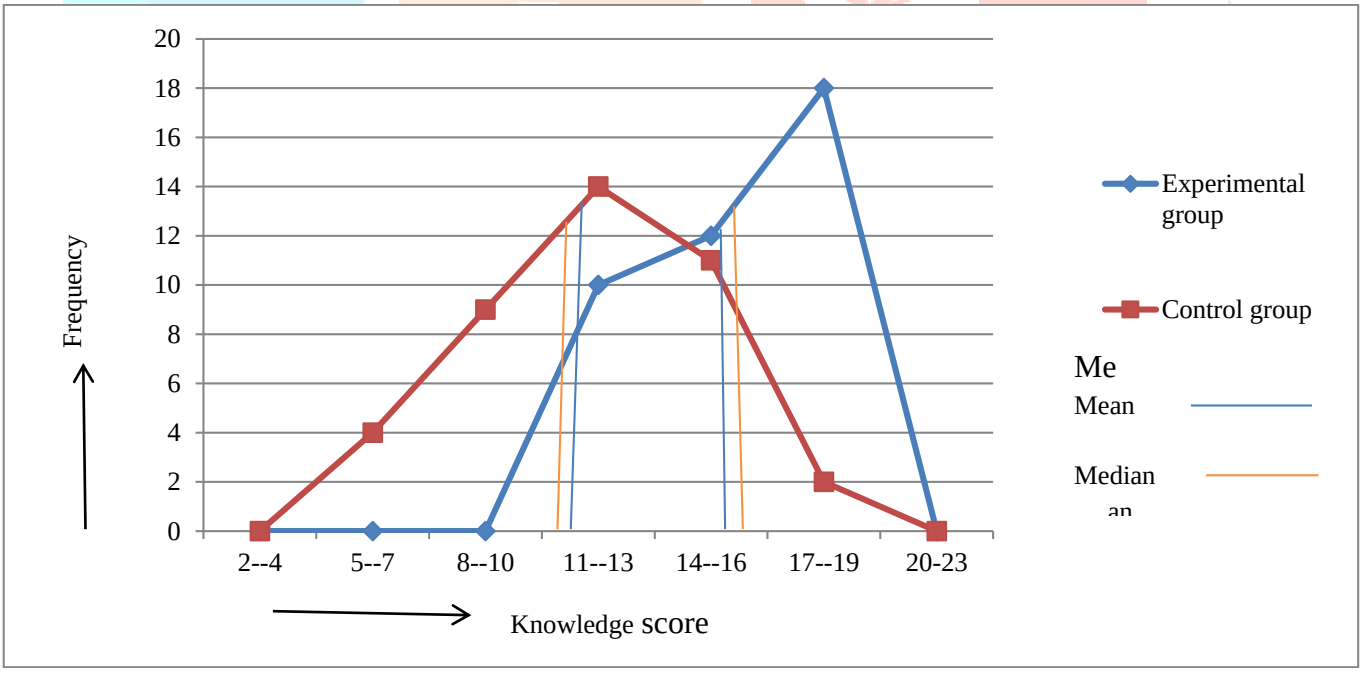

Fig 2.Comparison between post-test sleep hygiene knowledge score of adolescents in experimental group and control group

The frequency polygon in figure 2 indicated that the post-test knowledge score of adolescents in Experimental group range was from 11 to 19 with mean 15.65± 2.28 and median 16 and it was negatively skewed. The posttest sleep hygiene Knowledge score of adolescents in control group range was from 5-17 with mean 11.87± 3.04 and median 11 and it was positively skewed.
The figure also indicated that mean post-test knowledge score of experimental group was apparently higher than mean post-test knowledge score of control group.

Table 2 Domain wise and total mean and standard deviation of pre-test and post-test ASHS score of adolescents in experimental and control Group

n=80(n_E =40, n_C=40)

Domain of ASHS	Experimental Group		Control Group	
	Pre-test Score Mean(sd)	Post-test Score Mean (sd)	Pre-test Score Mean(sd)	Post-test Score Mean (sd)
Physiological Factor	23.85(3.91)	25.2(3.32)	23.68(3.34)	23.73(3.34)
Behavioural Arousal Factor	9.2(4.36)	9.63(4.17)	9.38(3.42)	9.38(3.42)
Cognitive/ Emotional Factor	25.38(3.7)	26.08(3.6)	24.75(5.71)	24.90(5.82)
Sleep Environment Factor	25.7(4.87)	25.95(4.56)	25.78(3.08)	25.78(3.08)
Sleep Stability Factor	11.15(2.42)	11.53(2.11)	11.15(2.68)	11.10(2.64)
Daytime Sleep Factor	10.4(1.34)	11.15(1.03)	10.65(1.67)	10.65(1.67)
Substance Factor	11.58(0.56)	11.58(0.56)	12(0)	12(0)
Bedtime Routine	3.03(2.02)	3.85(1.87)	2.18(1.52)	2.18(1.52)
Total ASHS Score	120.58(12.87)	125.45(11.66)	119.55(12.1)	119.7(12.09)

Data presented in table 2 showed that in experimental group mean post-test ASHS score was higher than mean pre-test ASHS score in the all domains of Adolescents Sleep Hygiene Scale (ASHS) except substance factor which was remain unchanged.

Whereas in control group mean post-test ASHS score was remain same with pre-test score in all domains of ASHS except in Physiological and Cognitive/emotional factor which were higher than pre-test score.

Table 3 Mean, Standard deviation, Mean difference, and paired 't' test value of thepre-test and post-test knowledge score of adolescents within group

n_E=40, n_C=40

Knowledge Score	Mean	Sd	Mean difference	Paired 't' test value
Experimental group				
Pretest	11.50	3.07	4.15	9.20
Posttest	15.65	2.28		
Control group				
Pre-test	11.55	2.86	0.32	1.57
Post- test	11.87	3.04		
	't'= $1.685_{df\ (39)}$; p=0.05		't'= $3.55_{df\ (39)}$; p=0.001	

Data presented in table 3 revealed that Paired 't' value was computed between pre-test and post-test knowledge score in experimental group which was found statistically significant from corresponding 't' value (9.20) indicating that the mean difference (4.15) was a true difference and not by chance.

Hence null hypothesis H_{01} was rejected and research hypothesis H_1 was accepted. So it could be concluded that sleep promotion education was effective in increasing the sleep hygiene knowledge of adolescents in experimental Group.

Data also showed that Paired 't' value was computed between pre-test and post-test knowledge score in control group which was found statistically not significant from corresponding 't' value (1.57) indicating that the mean difference(0.32) was by chance and not a true difference.

So it could be concluded that the change in knowledge in experimental group was occurred due to sleep promotion education.

Table 10 Mean, Standard deviation, Mean difference, and Independent 't' value of adolescents in between groups.

n=80(n_E =40, n_C=40)

Knowledge Score	Mean	Sd	Mean difference	Independent 't' value
Pre-test				
Experimental group	11.50	3.07	0.05	0.07
Control group	11.55	2.86		
Post Test				
Experimental group	15.65	2.28	3.78	6.28
Control group	11.87	3.04		

't'=1.667 $_{df\ (78)}$; p=0.05't'=3.42$_{df\ (78)}$; p=0.001

Data presented in table 10 depicted that Independent 't' value was computed between post-test knowledge score of experimental and control group which was found to be statistically significant as evident from corresponding 't' value (6.28) indicating that the mean difference(3.78) was a true difference and not by chance.

Hence null hypothesis H_{02} was rejected and research hypothesis H_2 was accepted. So it could be concluded that sleep promotion education was effective in increasing the sleep hygiene knowledge of adolescents.

Data also showed that Independent 't' value was computed between pre-test knowledge score of experimental and control group which was found statistically not significant from corresponding 't' value (0.07) indicating that the mean difference (0.05) was by chance and not a true difference.

So it could be concluded that in post-test the difference in knowledge between experimental and control group was occurred due to sleep promotion education.

Table 11 Mean, Standard deviation, Mean difference, and Paired 't' value ofthe pretest and posttest ASHS score of adolescents within group

n_E =40

ASHS Score	Mean	Sd	Mean difference	Paired 't' value
Experimental group				
Pre-test	120.58	12.87	4.87	7.30
Post-test	125.45	11.66		
Control group				
Pre-test	119.55	12.10	0.15	1.18
Post-test	119.7	12.09		

't'= 1.685$_{df\ (39)}$; p=0.05 't'= 3.55 $_{df\ (39)}$; p=0.001

Data presented in table 11 depicted that Paired 't' value was computed between pre-test and post-test ASHS score in experimental group which was found to be statistically significant as evident from corresponding 't' value (7.30) indicating that the mean difference(4.87) was a true difference and not by chance.

Hence null hypothesis H_{03} was rejected and research hypothesis H_3 was accepted. So it could be concluded that sleep promotion education was effective in increasing the sleep behaviour practice of adolescents in experimental group.

Data also showed that Paired 't' value was computed between pre-test and post-test ASHS score in control group which was found statistically not significant from corresponding 't' value (1.18) indicating that the mean difference(0.15) was by chance and not a true difference.

So it could be concluded that the change in Sleep behaviour in experimental group was occurred due to sleep promotion education.

Table 12 Mean, Standard deviation, Mean difference, Standard deviation, and Independent't' value of the post-test ASHS score of adolescents in between groups.

$n=80(n_E=40, n_C=40)$

ASHS Score	Mean	Sd	Mean difference	Independent 't' value
Pre-test				
Experimental group	120.58	12.87	1.03	0.37
Control group	119.55	12.10		
Post Test				
Experimental group	125.45	11.66	5.75	2.17
Control group	119.7	12.09		

't'= $1.667_{df\ (78)}$; p=0.05

Data presented in table12 depicted that Independent 't' value was computed between post-test knowledge score of experimental and control group which was found statistically significant as evident from corresponding 't' value (2.17) indicating that the mean difference(5.75) was a true difference and not by chance.

Hence null hypothesis H_{04} was rejected and research hypothesis H_4 was accepted. So it could be concluded that sleep promotion education was effective in increasing the sleep behaviour practice of adolescents in experimental group.

Data also showed that Independent 't' value was computed between pre-test ASHS score of experimental and control group which was found statistically not significant from corresponding 't' value (0.37) indicating that the mean difference(1.03) was by chance and not a true difference.

Findings related to pre-test and post-test sleep hygiene knowledge score of the adolescents before and after Sleep promotion Education in experimental and Control group:

- In experimental group maximum (42.50%) adolescents scored good and minimum (5.00%)scored excellent in pre-test whereas 45% scored excellent in post-test and majority (50%) of the adolescents scored good followed by maximum.
- In control group maximum adolescents in pre-test (45%) and post-test (42.50%) had average sleep hygiene knowledge.

Findings related to pre-test and post-test Adolescents sleep hygiene scale (ASHS) score of the adolescents before and after Sleep promotion Education in experimental and Control group.

- In experimental group mean pre-test ASHS score was 120.58±12.87 and mean post- test ASHS score was 125.45±11.66.
- In control group mean pre-test ASHS score was 119.55±12.1 and mean post- test ASHS score was 119.7±12.09.

Findings related to effects of Sleep promotion Education in terms of pre-test and post-test sleep hygiene knowledge score of the adolescents in experimental group.

- The mean post-test knowledge score (15.65±2.28) were apparently higher than the mean pre-test knowledge score (11.5± 3.07) of adolescents in experimental group with a mean difference of 4.15.
- Paired 't' value was computed from the above data which was found statistically significant from corresponding 't' value (9.20) indicating that the mean difference (4.15) was a true difference and not by chance.

Findings related to effects of Sleep promotion Education in terms of post-test sleep hygiene knowledge score of the adolescents in experimental and control group.

- The mean post-test sleep hygiene knowledge score of adolescents in experimental group (15.65±2.28) were apparently higher than mean post-test sleep hygiene knowledge score of adolescents of control group (11.87±3.04) with a mean difference of 3.78.
- Independent 't' value was computed from the above data which was found to be statistically significant as evident from corresponding 't' value (6.28) indicating that the mean difference (3.78) was a true difference and not by chance.

Findings related to effects of Sleep promotion Education in terms of pre-test and post-test ASHS score of the adolescents in experimental group.

- The mean post-test ASHS score (125.45± 11.66) was higher than the mean pre-test ASHS score of adolescents (120.58± 12.87) in experimental group with a mean difference 4.87.
- Paired 't' value was computed from the above data which was found to be statistically significant as evident from corresponding 't' value (7.30) indicating that the mean difference(4.87) was a true difference and not by chance.

Findings related to effects of Sleep promotion Education in terms of post-test sleep hygiene knowledge score of the adolescents in experimental and control group.

- The mean posttest ASHS score of adolescents of experimental group (125.45±11.66) was higher than mean post-test ASHS score of adolescents in control group (119±12.09) with a mean difference 5.75.
- Independent 't' value was computed from the above data which was found significant as evident from corresponding 't' value (2.17) indicating that the mean difference(5.75) was a true difference and not by chance.

Discussion:

Discussion related to the sleep hygiene knowledge among adolescents:

The present study was partially supported by a study conducted by Manik Mohammad Isaque & Sreevani R. (2016) conducted a pre-experimental study with 60 pre- university students to evaluate the effectiveness of structured teaching programme regarding sleep hygiene and sleep disorders on knowledge of pre-university students in a selected college at Bengaluru.

Discussion related to the sleep behaviour practice among adolescents:

The present study was supported by a study a cross sectional study was undertaken by Misra S (2016) to assess sleep quality, sleep hygiene and daytime sleepiness among 257 students of 9th and 11th grade in Vellore city.

Discussion related to the effect of sleep promotion education on sleep hygiene knowledge and sleep behaviour practice among adolescents:

The present study was supported by a pre-experimental study conducted by Illingworth G, Sharman R, Harvey CJ, Foster RG (2016) to investigate the impact of school based sleep education programme on adolescents' sleep and sleep knowledge.

Study result also found that education programme was also effective to improve the sleep hygiene practice of the adolescence {t (561)=-2.61, p=0.0009}.

Discussion related to the relationship between sleep hygiene knowledge and sleep behaviour practice among adolescents:

The present study finding was supported by a study conducted by Revathi R, Manjula A, & Sujhita P(2016) on correlation between knowledge and practice on sleep hygiene and sleep quality among Nursing student, Tamilnardu. hygiene(r=.047).

Conclusion:

After completing the total procedure the researcher administered the sleep promotion education to the control group for ethical consideration. The current study revealed that sleep promotion education was effective to increase the sleep hygiene knowledge and sleep behaviour practice of adolescents. Researcher was a planned stratified random sampling technique to select the subject. But in the time of pilot study it was faced difficult to select subject by random sampling technique due to Covid situation. So non-probability sampling technique was adopted for the present study.

Acknowledgement

The investigator thanks sincerely to all the experts who spread their valuable time for content validation of the tool for the study. The researcher sincere thanks conveyed to District Inspector of Schools (S.E.), Bankura district for giving her permission to conduct the study and help in selection of school.

Researcher extends her heartfelt thanks to all the participants and their parents/guardian for their active cooperation without which it would have been impossible to complete the study.

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