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Original Research Article

Effect of information, education and communication activity on health literacy of diabetes among school going adolescents in Delhi

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ABSTRACT

Background: Diabetes is a leading cause of death worldwide, accounting for nearly 3 million deaths annually. In India, it contributes to around 6-7 lakh deaths annually. Unhealthy diet, physical inactivity, tobacco consumption are the modifiable risk factors for diabetes. Many of these risk factors start from adolescence and continue till adulthood if no intervention is done. Diabetes can be treated and its consequences avoided or delayed with diet, physical activity, medication and regular screening and treatment for complications, however the decisions to take above steps needs certain level of health literacy.
Methods: It was a school-based interventional study conducted in two government schools of Delhi among students of classes 6 to 8. After the baseline data on level of knowledge regarding diabetes was collected, the educational interventions (three times) were done in the form of IEC using pamphlets, posters, and didactic lectures on diabetes. The post-intervention data were collected two weeks (immediate) after the first intervention and three months (long-term) after the last intervention.
Results: There were a higher proportion of students with satisfactory level of knowledge of diabetes both at two weeks and three months after the interventions in both the schools, and the results were found to be statistically significant after using Chi square test ($p<0.05$).
Conclusions: The health literacy regarding diabetes had improved significantly after intervention in the form of IEC activities (posters, pamphlets and didactic lectures) when given repeatedly among school-going adolescents.

Keywords: Health literacy, Diabetes, Information, Education and communication, Adolescents

INTRODUCTION

Globally, diabetes is the direct cause of approximately 1.6 million deaths in a year, and contribute to 3.1 percent of all deaths in India.[1] Risk factors such as obesity, lack of physical activity, unhealthy diets are commonly known risk factors of diabetes. These unhealthy behaviours start even before adolescence and continue till adulthood.[2] Thus, intervention should start at an early age as it takes time for healthy practices to blend into behaviour. To address the vast magnitude of this problem, health literacy may play an important role in prevention. A school is a key location for educating children about health, hygiene, and nutrition and for putting in place the interventions to promote the health of children.[3] Health literacy is defined as the ability to obtain, read, understand, and use health-care information to make appropriate health decisions for one's own health and family and community health and follow instructions for treatment.[4] An adequately health literate individual can communicate with health professionals, understand and use health materials (in a variety of formats) that they need to stay healthy, apply health-related knowledge to health care, and decision-making so that they are able to

make healthy choices and have more control over the things.[5]

This study was done with the objective: to assess the health literacy of diabetes among school-going adolescents; conducting intervention by information, education and communication (IEC) activities among school-going adolescents regarding diabetes; and assessing the effect of the different IEC activities among them.

METHODS

It was a school-based interventional study conducted in Najafgarh (New Delhi) which is the rural field practice area of Department of Community Medicine of Vardhman Mahavir Medical College and Safdarjung Hospital, Delhi. The study was conducted during November 2015 to April 2017. The data collection was done during June 2016 to January 2017. Prior permission was obtained from school authorities and approval from the Institutional Ethics Committee. From the total of 13 schools in Najafgarh area, two schools were selected by simple random sampling and students of classes 6, 7, and 8 from both the schools were included in the study. There were four to five sections each of classes 6, 7, and 8. Thus, one section each of classes 6, 7, and 8 were selected by simple random sampling in both the schools separately. Two schools were selected so that different forms of IEC activities may be done. After calculating the sample size from previous study; a total of 120 students each from both the schools were included in the study.

Study tools

A pretested, semi-structured, self-administered questionnaires based on the materials to be used for intervention was used for baseline and post intervention data. The questions were based on the IEC material on NCDs obtained from the World Health Organization (WHO) and Central Health Education Bureau (CHEB offices, Delhi). The questionnaire consisted of the questions to gather demographic information of the participants; general awareness of diabetes, numeric literacy like knowledge of normal values of blood glucose, risk factors and organs affected due to diabetes, preventive and treatment measures of diabetes. The response options were yes/no/don't know. Some questions were open ended also. Each right answer was awarded score 1 (one) and wrong answer as 0 (zero). No response was considered as an incorrect response and was scored 0 (zero). The responses were scored and categorised as unsatisfactory (<50%) and satisfactory (≥50%). The maximum score was 26 and the minimum score was zero.

Intervention

The intervention was given in the form of IEC activity with the help of posters and pamphlets obtained from the WHO and CHEB offices in Delhi. For school 1, posters were distributed to the students after the baseline evaluation and pamphlets were displayed in common areas of school like school notice boards, reception area, outside library and corridors. For the intervention in school 2, content of the lecture was prepared from the same reference material as described above in the form of PowerPoint presentation.

Data collection

The data was collected at baseline and then intervention was done after this. Then the post intervention data was collected after 2 weeks. The intervention was done once a month for the next two months. Thus, the intervention was done for a total of three times - one after baseline data collection and then monthly for two months for reinforcement. Then post intervention data was again collected after 3 months from the last intervention to assess both the immediate and long-term retention.

Data analysis

Data analysis was done using statistical package for social sciences (SPSS) software for windows version 17.0. Released 2008 (SPSS Inc., Chicago, IL). All the values were analysed by using descriptive statistics to calculate frequencies, mean, range, and standard deviation. Chi-square test was applied to compare the proportion of scores (satisfactory and unsatisfactory) at baseline, 2 weeks, and 3 months, and $p<0.05$ was considered statistically significant.

RESULTS

Demographic profile of the participants

There were a total of 120 students each from school 1 and school 2 who participated in the study. The mean age of students in school 1 was 12.2±1.2 years and that of students of school 2 was 12.2±0.9 years. School 1 had higher proportion of girls 88 (73.3%) and school 2 had higher proportion of boys 66 (55.0%). A total of 111 (92.5%) of students from school 1and 115 (95.8%) from school 2 were Hindu by religion.

From school 1, 25 (20.8%) students were in class 6 whereas from school 2, 32 (26.7%) students were in class 6. Similarly, 30 (25%) students of school1 were in class 7 and 42 (35%) students of school 2 were in class 7. A total of 65 (54.2%) students of school 1 were in class 8 and 46 (38.3%) students of school 2 were in class 8. A total of 82 (68.3%) of students of school 1 and 65 (54.2%) of the students of school 2 belonged to nuclear family and the rest from joint family. Approximately half of the students i.e., 55 (45.9%) of school 1 and 36 (30%) of school 2 belonged to socio-economic class IV according to modified BG Prasad scale, 2017. Fathers of 39 (32.5%) of students of school 1 studied up to primary school and 40 (33.3%) of those of school 2 studied up to middle school. Either parent of the study participants of both the schools was gainfully employed (Table 1).

Table 1: Distribution of study participants according to socio-demographic characteristics.

Demographic variables	School 1 (n=120) N (%)	School 2 (n=120) N (%)
Age (in years)		
Mean	12.2±1.2	12.2±0.9
Range	6 (10-16)	6 (10-16)
Sex		
Boys	32 (26.7)	66 (55.0)
Girls	88 (73.3)	54 (45.0)
Religion		
Hindu	111 (92.5)	115 (95.8)
Others	09 (07.5)	05 (04.2)
Class		
6th	25 (20.8)	32 (26.7)
7th	30 (25.0)	42 (35.0)
8th	65 (54.2)	46 (38.3)
Type of family		
Nuclear	82 (68.3)	65 (54.2)
Joint	38 (31.7)	55 (45.8)
SES class*		
I	03 (02.5)	12 (10.0)
II	13 (10.8)	21 (17.5)
III	30 (25.0)	31 (25.8)
IV	55 (45.9)	36 (30.0)
V	19 (15.8)	20 (16.7)
Father's education		
Illiterate	13 (10.8)	04 (03.3)
Primary	39 (32.5)	12 (10.0)
Middle	22 (18.4)	40 (33.3)
High	24 (20.0)	22 (18.3)
Senior secondary	13 (10.8)	24 (20.0)
Graduate	08 (06.7)	17 (14.3)
Post graduate	01 (0.8)	01 (0.8)
Mother's education		
Illiterate	37 (30.9)	12 (10.0)
Primary	44 (36.7)	27 (22.5)
Middle	17 (14.1)	33 (27.5)
High	18 (15.0)	20(16.7)
Senior secondary	04 (03.3)	16 (13.3)
Graduate	00 (0)	12 (10.0)
Post graduate	00 (0)	00 (0.0)
Parents' employment status		
Gainfully employed	120 100)	120 (100)
Unemployed	00 (0)	00 (0)

*Socio-economic class according to Modified BG Prasad Scale, 2017

General awareness of the participants regarding diabetes

From school 1, 82 (68.3%) students had heard of diabetes and from school 2, 92 (76.7%) students from school 2 had heard of diabetes. Only 2 (1.7%) students in school 1 and 3 (2.5%) students in school 2 knew normal blood glucose values correctly. About 49 (40.8%) students in school 1 and 65 (54.2%) students in school 2 knew that blood glucose level increases in diabetes. About 12 (10%) students in school 1 and 08 (8.3%) students in school 2 knew which investigation is to be done to diagnose diabetes. About 48 (40%) students in school 1 and 62 (51.7%) students in school 2 knew any age group can be affected due to diabetes. About 51 (42.5%) students in school 1 and 56 (46.7%) students in school 2 knew that diabetes may be prevented. 'Increased urination' was the symptom known to a maximum of 39 (32.5%) students in school 1 followed by tingling known to 38 (31.7%) students whereas from school 2 'fatigue' was the commonest symptom about which 44 (36.7%) students were aware followed by 'increased thirst' and 'increased urination' both known to 42 (35%) students in school 2. Knowledge of 'delayed wound healing' as the symptom of diabetes was known to the least number of students i.e., 23 (19.2%) in school 1 and that 'weight loss' and 'delayed wound healing' occurs in diabetes was known to the least number of students 29 (24.2%) in school 2 (Table 2).

'Blood vessels' were affected due to diabetes was known to a maximum number of students both in school 1 i.e., 34 (28.3%) and 40 (33.3%) students in school 2. That reproductive organs are affected due to diabetes was known to the least number of students i.e., 18 (15%) in school 1 and kidney as the organ affected due to diabetes was known to the least number of students in school 2 i.e., 24 (20 %) students (Table 3).

Regular blood sugar check-up was the most common preventive measure of diabetes known to 68 (56.7%) students in school 1 and 76 (63.3%) students in school 2 while the least known preventive measure was decreasing stress levels known to 37 (30.8 %) students in school 1 and 27 (22.5%) students in school 2 (Table 4).

Diabetic diet as advised by doctor as the management measure for diabetes was known to the maximum of 69 (57.5%) students in school 1 and 78 (65%) students in school 2 whereas limb care as the management measure for Diabetes was known to the least number of students in school 1 i.e., 24 (20%) students and 28 (23.3%) students in school 2 (Table 5).

There was a higher proportion of students with satisfactory level of knowledge of diabetes after 2 weeks of intervention in school 1i.e., 29.7% compared to 14.2% before intervention and the difference was found to be statistically significant (p value <0.05). Similarly, there was a higher proportion of students with satisfactory level of knowledge of diabetes after 2 weeks of intervention in school 2 i.e., 56.5% compared to 25.0% before intervention and this difference was found to be statistically significant (p value <0.05) (Table 6).

There was a higher proportion of students with satisfactory level of knowledge of diabetes after 3 months of

intervention i.e., 36.2% in school 1 compared to 14.2% before intervention and the difference was found to be statistically significant (p value <0.05). Similarly, there was higher proportion of students with satisfactory level of knowledge of diabetes after 3 months of intervention i.e., 62.1% in school 2 compared to 25% before intervention and this difference was statistically significant (p value <0.05) (Table 7).

Table 2: Distribution of study participants according to awareness of symptoms of diabetes at baseline.

Response	School 1 (n=120) N (%)				School 2 (n=120) N (%)			
	Yes	No	Don't know	Total	Yes	No	Don't know	Total
Unexplained weight loss	25 (20.9)	19 (15.8)	76 (63.3)	120 (100)	29 (24.2)	29 (24.2)	62 (51.6)	120 (100)
Delayed healing	23 (19.2)	21 (17.5)	76 (63.3)	120 (100)	29 (24.2)	27 (22.5)	64 (53.3)	120 (100)
Increased hunger	29 (24.2)	18 (15.0)	73 (60.8)	120 (100)	39 (32.5)	24 (20.0)	57 (47.5)	120 (100)
Increased thirst	25 (20.8)	15 (12.5)	80 (66.7)	120 (100)	42 (35.0)	18 (15.0)	60 (50.0)	120 (100)
Tingling	38 (31.7)	07 (05.8)	75 (62.5)	120 (100)	41 (34.2)	13 (10.8)	66 (55.0)	120 (100)
Fatigue	30 (25.0)	09 (07.5)	81 (67.5)	120 (100)	44 (36.7)	16 (13.3)	60 (50.0)	120 (100)
Increased urination	39 (32.5)	10 (08.3)	71 (59.2)	120 (100)	42 (35.0)	18 (15.0)	60 (50.0)	120 (100)

Table 3: Distribution of study participants of according to awareness of organs involved in diabetes at baseline.

Response	School 1 (n=120) N (%)				School 2 (n=120) N (%)			
	Yes	No	Don't know	Total	Yes	No	Don't know	Total
Heart	31 (25.8)	11 (09.2)	78 (65.0)	120 (100)	29 (24.2)	30 (25.0)	61 (50.8)	120 (100)
Kidney	22 (18.3)	17 (14.2)	81 (67.5)	120 (100)	24 (20.0)	33 (27.5)	63 (52.5)	120 (100)
Limbs	23 (19.2)	11 (09.2)	86 (71.6)	120 (100)	28 (23.3)	19 (15.8)	73 (60.9)	120 (100)
Blood vessels	34 (28.3)	04 (03.3)	82 (68.4)	120 (100)	40 (33.3)	20 (16.7)	60 (50.0)	120 (100)
Reproductive organs	18 (15.0)	09 (07.5)	93 (77.5)	120 (100)	28 (23.3)	19 (15.8)	73 (60.9)	120 (100)

Table 4: Distribution of study participants according to awareness of preventive measures of diabetes at baseline.

Response	School 1 (n=120) N (%)				School 2 (n=120) N (%)			
	Yes	No	Don't know	Total	Yes	No	Don't know	Total
Regular blood sugar monitoring	68 (56.7)	04 (03.3)	48 (40.0)	120 (100)	76 (63.3)	02 (01.7)	42 (35.0)	120 (100)
Regular exercise	41 (34.1)	18 (15.0)	61 (50.9)	120 (100)	57 (47.5)	10 (08.3)	53 (44.2)	120 (100)
Decreasing stress levels	37 (30.8)	14 (11.7)	69 (57.5)	120 (100)	27 (22.5)	20 (16.7)	73 (60.8)	120 (100)

Table 5: Distribution of study participants according to awareness of management of diabetes at baseline.

Response	School 1 (n=120) N (%)				School 2 (n=120) N (%)			
	Yes	No	Don't know	Total	Yes	No	Don't know	Total
Regular blood sugar monitoring	58 (48.3)	13 (10.8)	49 (40.9)	120 (100)	74 (61.7)	03 (02.5)	43 (35.8)	120 (100)
Regular medication	64 (53.3)	06 (05.0)	50 (41.7)	120 (100)	67 (55.8)	07 (05.8)	46 (38.4)	120 (100)
Limb care	24 (20.0)	16 (13.3)	80 (66.7)	120 (100)	28 (23.3)	26 (21.7)	66 (55.0)	120 (100)
Follow diet as advised by doctor	69 (57.5)	03 (02.5)	48 (40.0)	120 (100)	78 (65.0)	04 (03.3)	38 (31.7)	120 (100)
Quit smoking	36 (30.0)	14 (11.7)	70 (58.3)	120 (100)	53 (44.2)	09 (07.5)	58 (48.3)	120 (100)
Quit alcohol	40 (33.4)	13 (10.8)	67 (55.8)	120 (100)	58 (48.3)	07 (05.8)	55 (45.9)	120 (100)

Table 6: Comparison between level of knowledge of diabetes at baseline and 3 months after intervention in school 1 and 2.

School 1	Before interven-tion	2 weeks	Total	School 2	Before intervention	2 weeks	Total
Satisfactory	17 (14.2)	33 (29.7)	50	Satisfactory	30 (25.0)	65 (56.5)	95
Unsatisfactory	103 (85.8)	78 (70.3)	181	Unsatisfactory	90 (75.0)	50 (43.5)	140
Total	120 (100)	111 (100)	231 (100)	Total	120 (100)	115 (100)	235 (100)
P value*		<0.05				<0.05	

*Chi square test was used as test of significance

Table 7: Comparison between level of knowledge of diabetes at baseline and 3 months after intervention in school 1 and 2.

School 1	Before interven-tion	3 months	Total	School 2	Before intervention	3 months	Total
Satisfactory	17 (14.2)	34 (36.2)	51	Satisfactory	30 (25.0)	59 (62.1)	89
Unsatisfactory	103 (85.8)	60 (63.8)	163	Unsatisfactory	90 (75.0)	36 (37.9)	126
Total	120 (100)	94 (100)	214 (100)	Total	120 (100)	95 (100)	215 (100)
P value*		<0.05				<0.05	

*Chi square test was used as test of significance

DISCUSSION

In present study 68.3% students in school 1 and 76.7% students on school 2 had heard of diabetes. In a study conducted by Mane et al in 2010, Karnataka, they found that awareness about DM was 51.3% in government school and 93.3% in private school. Overall awareness in both the schools for DM was 77.5%.[6] This is similar to present study. Similarly, in other study conducted by Divakaran et al in 2013 in Pariyaram in Kannur district of Kerala, they found that 53.1% had heard about diabetes.[7] In present study participants the awareness level was higher. This can be explained by the different study settings; Pariyaram is a small town while present study is done in a metro like Delhi. In a study conducted by Nair et al in 2015 among adolescents of age 10-19 years residing in urban neighbourhoods of central Delhi using interviewer administered questionnaire by house-to-house survey, they found that 61.6% students had heard about diabetes.[8] Present study has found higher awareness as it was conducted in school going children and in the other study even school drop outs were included. In a study conducted by Chaudhari et al in 2015 in high school children of Patan city, Gujarat they found that baseline knowledge regarding the names of condition like DM was 53.4%.[9] Present study has found higher awareness despite of junior classes (6th to 8th) taken in present study. Similarly, in a study conducted by Shivalli et al in 2010 in Varanasi, they found that 27.3% were aware of diabetes, this was much lower than in present study because of different study settings where present study is conducted in a metro like Delhi where IEC campaigns are focussing on NCDs.[10]

In present study 6.7% students in school 1 and 14.2% students in school 2 knew diabetes occurred due to decrease in Insulin. In a multiple component community-based controlled trial conducted by Singhal et al in 2010 among 11th grade students of North India, they found that 51.5% students in intervention school and 39.2% students in control school at baseline knew that diabetes was caused by lack of insulin.[11] In a study conducted by Okoh et al in 2014 in Nigeria, they found that 0.2% students were aware that it was due to deficiency of Insulin. [12] In a study conducted by Al-Hussaini et al in 2015 in Kuwait, they found that 63.6% students correctly knew that diabetes is a condition of not enough insulin in our body.[13] Present study had found lower awareness level which may be because of lower age group of study participants in the present study.

In present study, 1.7% students in school 1and 2.5% students in school 2 knew the normal blood glucose levels. In a study conducted by Al-Mahrooqi et al in 2011 in Oman, they found that 45% students were aware of normal fasting blood glucose levels and 24% of them knew about normal random blood sugar levels.[14] Possible reason for lower awareness in the present study has been discussed above.

In present study, 40.8% students in school 1 and 54.2% students in school 2 knew that the blood glucose level increases in diabetes. In a study conducted by Okoh et al in 2014 in Nigeria, they found that 33% students knew that diabetes meant an abnormally high blood glucose level.[12] In a study conducted by Al-Hussaini et al in 2015 in Kuwait, they found that 85.1% students correctly knew that diabetes is a condition of high blood sugar.[13] Present study has found lower awareness regarding this which may be because of higher age of study participants in the Kuwait study.

In the present study, 42.5% students in school 1 and 46.7% students in school 2 knew that diabetes was preventable. In a study conducted by Nair et al in 2015 in Delhi, only 10.6% students knew that diabetes was preventable.[8] In another study conducted by Mane et al in Karnataka, they found that only 60% students of government school knew that DM could be prevented.[6] Divakaran et al in 2013 in a study conducted in Pariyaram in Kannur district of Kerala, found that 47.5% students felt that DM could be prevented.[7]

In present study, 40.0% students in school 1 and 51.7% students in school 2 knew that any age group can be affected due to Diabetes. In a study conducted by Okoh et al in 2014 in Nigeria, they found that 87% students knew correctly the disease could occur in childhood. [12] In a study conducted by Al-Hussaini et al in Kuwait, they found that 85.1% students correctly knew that diabetes occur in children, adolescents, and adults.[13] Present study has found lower awareness level. The higher grades of students (11th and 12th) in their study may have contributed to higher level of awareness as compared to the present study.

In present study, increased urination as the symptom of diabetes was known to maximum i.e., 32.5% students followed by tingling which was known to 31.7% from school 1 whereas from school 2, fatigue was the commonest symptom about which 36.7% students were aware followed by increased thirst and increased urination which was known to 35% students respectively. The least known symptom of diabetes was delayed wound healing known to 19.2% students in school 1 and in school 2 weight loss and delayed wound healing were the least known symptom of diabetes. Al-Hussaini et al in Kuwait, found similar results in their study i.e., frequent urination was the most common symptom known to 82.6% students.[13] The least known symptom which was weight loss despite normal appetite which is also similar to present study.

In present study, the maximally known organ involved in diabetes was blood vessels in both the schools known to 28.3% students in school 1 and, 33.3% in school 2. The least known organ involved in diabetes was reproductive organs (known to 15% students) in school 1 and in school 2 kidney as the least known organ involved in diabetes known to 20% students. In a study conducted by Al-Hussaini et al in 2015 in Kuwait, they found high blood pressure as the most commonly known complication of diabetes due to involvement of blood vessels and involvement of limbs (loss of sensation in arms and legs) as the least commonly known complication.[13]

Regular blood sugar monitoring was the most common preventive measure of diabetes known to 56.7% students in school 1 and 63.3% students in school 2 while the least known preventive measure was decreasing stress levels known to 30.8% students in school 1 and 22.5% in school 2. In a study conducted by Al-Hussaini et al in 2015 in Kuwait, they found that 87% students correctly knew that diabetics should test their blood sugar regularly.[13] In a study conducted by Al-Mahrooqi et al in 2011 in Oman, they found that 86% of the students knew that diabetics need a special diet, exercise and medications to manage their condition, and 60% of them reported that exercise could help to control blood sugar levels. However, only 27% of the students knew that the diabetic meal plan must be individualised to meet the patient's needs.[14]

In present study, following diet as advised by doctor was the most commonly known treatment measure known to 57.5% students in school 1 and 65% students in school 2. Limb care was the least commonly known treatment measure of diabetes known to 20% students in school 1 and 23.3% students in school 2. In a study conducted by Al-Mahrooqi et al in 2011 in Oman, they found weight reduction was recognised by 64% of the students as part of diabetes management.[14] In a study conducted by Al-Hussaini et al in 2015 in Kuwait, they found that diabetics should exercise regularly as part of diabetes management was known to the maximum of 73.6% students.[13]

In present study, before intervention 14.2% students in school 1 and 25% students in school 2 had satisfactory score (>50%) about knowledge of diabetes. In a study conducted by Al-Mahrooqi et al in 2011 in secondary schools of Oman. They found that, 24% students had score of more than 10 out of 20 i.e., ≥50%, this is similar to school 2 in present study although higher classes have been included in their study as compared to ours.[14]

In a study conducted by Okoh et al in 2014 in Nigeria, they found 20% students had good knowledge (18-25 marks out of 25) about diabetes which is comparable to ours results.[12]

In present study there was a higher proportion of participants with satisfactory level of knowledge of diabetes at 2 weeks and 3 months after intervention in both schools; school 1 and 2. Similar finding was observed in a community-based multi-component nutrition and lifestyle intervention study, controlled trial conducted by Singhal et al in 2010 in North India where knowledge of cause of diabetes and management of diabetes with diet increased significantly in the intervention school after 6 months.[11] Also in another interventional study conducted by Shah et al in 2010 among students of age 8-18 years in 3 cities of North India (New Delhi, Jaipur and Agra), they found that the correct knowledge about diabetes was 38-86% at the baseline which increased significantly to 67-88% among students of all age groups 6 months after the MARG (Medical education for children/adolescents for realistic prevention of obesity and diabetes and for healthy ageing) intervention among age group 8-18 years.[15]

Limitations

The present study has mainly four limitations. It was conducted in government schools of Delhi and hence the results cannot be generalized to the students studying in other types of schools such as private or government aided

schools. Secondly, though the selected two schools were physically located at a distance from each other but a possibility of some contamination may not be ruled out. Thirdly, it was a self-administered questionnaire- based study, inaccurate or incomplete reporting by the students cannot be ruled out. Fourthly, the post intervention data was collected at three months after the last intervention; thus, there was attrition and the same students could not be followed up.

Strengths

Though there is no scarcity of literature on awareness of lifestyle diseases among school children, however there is a paucity of research on health literacy of various lifestyle diseases and their risk factors and preventive measures among school going adolescents in India. The research has interventional study design which is its main strength. Two different interventions were done in the two arms of the study which further adds to the strength of the study. Interventions were given a total of 3 times for the reinforcement of the knowledge in both the arms. The post-intervention data were collected at two points of time i.e., at 2 weeks and 3 months after the intervention. The study has scientific methodology of calculation of sample size and selection of participants. There was a high adherence of study participants at pre-test and 2 weeks of follow up after the intervention. A 10% of the extra study participants were included in the study to account for the attrition. A pre-tested, pre-designed and validated questionnaire was used for the study. IEC material was designed and prepared by the institutions of national repute and were also pre-tested.

CONCLUSION

To conclude from this study, though the majority of the students had heard about diabetes, the knowledge about normal blood glucose values and investigation to diagnose the diabetes is minimal. This is an important aspect to stress upon because such knowledge helps them make good choices of food as well as improve their health seeking behaviour when they become adult. There was a statistically significant improvement in the satisfactory knowledge of diabetes after both types of intervention i.e., poster display, hand-outs and didactic lectures.

Hence, IEC intervention to improve the health literacy of diabetes in schools should be provided and it may be in various forms like didactic lectures, pamphlets and display of poster.

Recommendations

School health programs should focus on enhancing health literacy of students about the common lifestyle disease like- diabetes and also on high risk factors like obesity, dietary factors, physical exercise, smoking and alcohol as healthy adolescence amounts to healthy adulthood and thus healthy community. Certain myths and wrong beliefs prevailed among the students; they need to be addressed first before imparting the correct information. One-time intervention may not be the solution and continued efforts should be made in this direction. IEC intervention may be given either in the form of didactic lectures or pamphlets and posters as both the forms of interventions were observed to be associated with statistically significant improvement in level of knowledge of diabetes.

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