RESEARCH ARTICLE

EFFECT OF IEC ACTIVITY ON HEALTH LITERACY OF HYPERTENSION AMONG SCHOOL GOING ADOLESCENTS IN DELHI

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ARTICLE INFO	**ABSTRACT**

Aim: The aim of the study was to assess the health literacy of school going adolescents regarding Hypertension, and to assess the improvement in knowledge after Information Education and Communication (IEC) activity.

Methodology: It was a school based-interventional study conducted in the year 2016. A list of all schools located in Najafgarh area which is the field practice area of VMMC and SJH was prepared and the two schools were selected by simple random method of sampling. A pre-tested, semi-structured, self-administered questionnaire was used given to a total of 120 students of classes 6th, 7th and 8th from each school for baseline and post – intervention data. Intervention was given in the form of posters and pamphlets in school 1 and by didactic lectures in school 2. Post – intervention data were collected at 2 weeks and at 3 months after the intervention. Data were analysed using licensed SPSS 21.0 software and Chi Square test was used to find the association between the dependent and independent variables.

Results: Before the intervention, from school 1, 81.7% of the students had heard of hypertension and from school 2, 83.0% students had heard of hypertension. A total of 6.7% students in school 1 and 2.5% students in school 2 knew normal blood pressure value. A total of 22.5% students in school 1 and 39.2% students in school 2 knew blood pressure increases in hypertension. Similarly a total of 67.3% students in school 1and 63.3% students in school 2 knew hypertension is preventable. There was a significantly higher proportion of students with satisfactory level of knowledge of hypertension after 2 weeks and 3 months of intervention in both the schools.

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INTRODUCTION

Globally Cardio Vascular Diseases (CVDs) account for approximately 17 million deaths a year, which is nearly 1/3 of total number of deaths occurring globally in a year (Bloom *et al.*, 2011). Of these, complications of Hypertension account for 9.4 million deaths worldwide every year (http://www3.weforum. org/docs/ WEF_Harvard_HE_GlobalEconomic Burden Non Communicable Diseases_2011.pdf). Hypertension is responsible for at least 45% of deaths due to heart diseases and 51% deaths due to stroke (http://apps.who.int/iris/bitstream /10665/148114/1/9789241564484_eng.pdf). In terms of attributable deaths, Hypertension is one of the leading behavioural and physiological risk factors to which 13% of global deaths are attributed (http://apps.who.int/iris/ bitstream/ 10665/148114/1/9789241564484_eng.pdf).

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Hypertension is reported to be the fourth contributor to premature deaths in developing countries and seventh in developing countries (http://apps.who.int/iris/bitstream/ 10665/148114/1/ 9789241564484_eng.pdf). Recent reports indicate that nearly 1 billion (more than a quarter) of the world's population had Hypertension in 2000. This is expected to increase to 1.56 billion by 2025 (World Health Organization, 2002). Increased prevalence in developing continents Asia, Africa will account for 75% of world's Hypertension patients in 2025. According to WHO estimates, prevalence of raised blood pressure (B.P.) in India is 32.5% (World Health Organisation, 2016). Recent studies from India has shown the prevalence of hypertension to be 25% in urban and 10% in rural India (Journal of Hypertension, 2014). To address this vast magnitude of this problem health literacy can play an important role. Health literacy is defined as the ability to obtain, read, understand and use healthcare information to make appropriate health decisions for one's own health and family and community health and follow instructions for treatment (Manganello, 2008).

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 things that make them healthy (https://www.gov.uk/government/publications/local-action-on-health-inequalities-improving-health-literacy. (Accessed on 23/04/17). Non- communicable diseases like Hypertension in adults have been related to the prevalence of risk factors in childhood (World Health Organization 2014). It is worth to assess the health literacy of school going children regarding hypertension and plan intervention measures for the same.

MATERIALS AND METHODS

It was a school –based interventional study conducted in Najafgarh in the year 2016 which is also the field practice area of Vardhman Mahavir Medical College and Safdarjung Hospital. Prior permission was taken from Deputy Directorate of Education (DDE), (South-West district of New Delhi) and Institutional Ethical Committee to conduct the study. From 13 schools in Najafgarh, two schools were selected by simple random method of sampling and the Principals of these schools were explained about the objectives and methodology of the study. A total of 120 students were selected from each school using a list of all students enrolled in class 6th, 7th and 8th obtained from both the schools. One section from each standard of both the schools was picked by simple random method. Sample size was calculated based on the data that 34.6% (p_1) students had knowledge that by exercising for at least one hour a day CVDs could be prevented based on the study conducted by George GM *et al* in 2014 in two Government and one private school in Central Delhi (George *et al.*, 2014). In this study the knowledge was expected to increase up to 60% (p_2) among the students after the intervention.

Taking an alpha error (α) and beta error (β) of 5%and 80% respectively and loss to follow up (or non-response) of upto 10% and design effect, sample size was calculated to be 120 students to be taken from both the intervention arms. Pre-tested, semi-structured, self- administered questionnaire in Hindi language was used for the purpose of the study. Each right answer was awarded one score. No response was considered as incorrect response. The maximum score for Hypertension was 32 and the minimum score was 0. The overall scoring of Hypertension was divided as<50% of the maximum score as unsatisfactory and ≥50% score as satisfactory. The type of intervention was also randomly assigned to schools. In one school 1, Information, Education and Communication intervention was given in the form of colored posters on Hypertension taken from World Health Organization Office, New Delhi and pamphlets prepared by Ministry of Health and Family Welfare and Central Health Education Bureau. In school 2, power point slides for giving lectures prepared from the same reference material as in school 1 was used.

Firstly, baseline evaluation of the health literacy of Hypertension was done by using the self-administered questionnaire. After that the first intervention was done on two separate days in both schools. The post-intervention data were obtained at two different points of time – one 2 weeks after the first intervention and the second after a gap of 3 months from

the last intervention to assess the long term retention of knowledge. Data entry was done in Microsoft -excel and analysed using licensed version of SPSS 21.0. Frequencies and mean were calculated for quantitative data and the Chi square test was used to find the association between dependent and independent variables. Data was represented in the form of tables.

RESULTS

The socio-demographic characteristics of the students are as per Table 1

Before the intervention, from school 1, out of 120 students, 98 (81.7%) of the students had heard of Hypertension and from school 2, out of 120,100 (83.0%) students had heard of Hypertension. A total of 08 (06.7%) students in school 1 and 03 (02.5%) students in school 2 knew normal B.P. A total of 27 (22.5%) students in school 1 and 47 (39.2%) students in school 2 knew B.P. increases in Hypertension. Similarly a total of 74 (67.3%) students in school 1and 76 (63.3%) students in school 2 knew Hypertension is preventable. As per table 2, from school 1, maximum of 43 (35.8%) students knew 'stress' was the risk factor of Hypertension whereas from school 2, maximum of 53 (44.2%) knew that 'increased cholesterol' was a known risk factor of Hypertension.

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)
Mother's/ Father's employment status		
Gainfully employed	120 100)	120 (100)
Unemployed	00 (0)	00 (0)

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

Table 2. Distribution of study participants according to awareness of risk factors of Hypertension before the intervention

	School 1 (n=120)				School 2 (n=120)			
Response*	Yes n(%)	No n(%)	Don't know n(%)	Total	Yes n(%)	No n(%)	Don't know n(%)	Total
Smoking	40 (33.3)	29 (24.2)	51 (42.5)	120 (100)	37 (30.8)	42 (35.0)	41 (34.2)	120 (100)
Weight gain	29 (24.2)	40 (33.3)	41 (42.5)	120 (100)	40 (33.3)	34 (28.3)	46 (38.4)	120 (100)
Stress	43 (35.8)	14 (11.7)	63 (52.5)	120 (100)	40 (33.3)	15 (12.5)	65 (54.2)	120 (100)
Long work hours	41 (34.2)	20 (16.7)	59 (49.1)	120 (100)	35 (29.2)	32 (26.6)	53 (44.2)	120 (100)
Improper diet	33 (27.5)	22 (18.3)	65 (54.2)	120 (100)	43 (35.8)	22 (18.3)	55 (45.9)	120 (100)
Increased blood cholesterol	41 (34.2)	10 (08.3)	69 (57.5)	120 (100)	53 (44.2)	08 (06.7)	59 (49.1)	120 (100)
Family History of Hypertension	22 (18.3)	36 (30.0)	62 (51.7)	120 (100)	19 (15.8)	44 (36.7)	57 (47.5)	120 (100)

*Multiple responses possible

Table 3. Distribution of study participants according to awareness of symptoms of Hypertension before the intervention

	School 1 (n=120)				School 2 (n=120)			
Response *	Yes n(%)	No n(%)	Don't know n(%)	Total	Yes n(%)	No n(%)	Don't know n(%)	Total
Fatigue	65 (54.2)	13 (10.8)	42 (35.0)	120 (100)	57 (47.5)	21 (17.5)	42 (35.0)	120 (100)
Headache	45 (37.5)	22 (18.3)	53 (44.1)	120 (100)	52 (43.3)	30 (25.0)	38 (31.7)	120 (100)
Chest pain	30 (25.0)	20 (16.7)	70 (58.3)	120 (100)	47 (39.2)	14 (11.7)	59 (49.1)	120 (100)
Dizziness	65 (54.2)	08 (06.7)	47 (39.1)	120 (100)	58 (48.3)	16 (13.3)	46 (38.4)	120 (100)

*Multiple responses possible

Table 4. Distribution of study participants according to awareness of organs involved in Hypertension before the intervention

	School 1 (n=120)				School 2 (n=120)			
Response *	Yes n (%)	No n (%)	Don't know n (%)	Total	Yes n(%)	No n (%)	Don't know n (%)	Total
Heart	43 (35.8)	21 (17.5)	56 (46.7)	120 (100)	29 (24.2)	30 (25.0)	61 (50.8)	120 (100)
Kidney	25 (20.8)	25 (20.8)	70 (58.4)	120 (100)	31 (25.8)	34 (28.3)	55 (45.9)	120 (100)
Brain	44 (36.7)	19 (15.8)	57 (47.5)	120 (100)	51 (42.5)	24 (20.0)	45 (37.5)	120 (100)
Blood vessels	62 (51.7)	10 (08.3)	48 (40.0)	120 (100)	67 (55.8)	15 (12.5)	38 (31.7)	120 (100)
Eyes	24 (20.0)	26 (21.7)	70 (58.3)	120 (100)	29 (24.2)	34 (28.3)	57 (47.5)	120 (100)

*Multiple responses possible

Table 5. Distribution of study participants according to awareness of preventive measures of Hypertension before the intervention

	School 1 (n=120)				School 2 (n=120)			
Response *	Yes n(%)	No n(%)	Don't know n (%)	Total	Yes n(%)	No n(%)	Don't know n(%)	Total
Regular B.P. check	73 (60.8)	13 (10.8)	34 (28.4)	120 (100)	80 (66.7)	09 (07.5)	31 (25.8)	120 (100)
Quit smoking	59 (49.2)	22 (18.3)	39 (32.5)	120 (100)	62 (51.7)	22 (18.3)	36 (30.0)	120 (100)
Regular exercise	61 (50.8)	10 (08.3)	49 (40.9)	120 (100)	70 (58.3)	09 (07.5)	41 (34.2)	120 (100)
Decreasing salt intake	53 (44.2)	15 (12.5)	52 (43.3)	120 (100)	50 (41.6)	22 (18.3)	48 (49.1)	120 (100)
Weight control	56 (46.7)	16 (13.3)	48 (40.0)	120 (100)	44 (36.7)	26 (21.7)	50 (41.6)	120 (100)

*Multiple response possible

Table 6. Distribution of study participants according to awareness of treatment measures of Hypertension before the intervention

	School 1 (n=120)				School 2 (n=120)			
Response *	Yes n(%)	No n(%)	Don't know n(%)	Total	No n(%)	Yes n(%)	Don't know n(%)	Total
Regular B.P. check	72 (60.0)	09 (07.5)	39 (32.5)	120 (100)	85 (70.8)	05 (04.2)	30 (25.0)	120 (100)
Quit smoking	64 (53.3)	21 (17.5)	35 (29.2)	120 (100)	66 (55.0)	21 (17.5)	33 (27.5)	120 (100)
Regular exercise	55 (45.8)	13 (10.8)	52 (43.4)	120 (100)	73 (60.8)	13 (10.8)	34 (28.4)	120 (100)
Decrease salt intake	55 (45.8)	14 (11.7)	51 (42.5)	120 (100)	55 (45.8)	17 (14.2)	48 (40.0)	120 (100)
Weight control	60 (50.0)	13 (10.8)	47 (39.2)	120 (100)	63 (52.5)	16 (13.3)	41 (34.2)	120 (100)
Balanced diet	51 (42.5)	18 (15.0)	51 (42.5)	120 (100)	68 (56.7)	09 (07.5)	43 (35.8)	120 (100)
Regular medication	60 (50.0)	12 (10.0)	48 (40.0)	120 (100)	65 (54.2)	16 (13.3)	39 (32.5)	120 (100)

*Multiple responses possible

The least known risk factor of Hypertension in both the schools was 'family history of Hypertension', known to 22 (18.3%) students in school 1 and 19 (15.8%) students in school 2. As per table 3, 'fatigue' as the symptom of Hypertension was known to the maximum of 65 (54.2%) students in school 1 and 'dizziness' as the symptom of Hypetension was known to the maximum of 58 (48.3%) students in school 2. 'Chest pain' was the least known symptom among students of both the schools, 30 (25%) in school 1 and 47 (39.2%) in school 2. As per table 4, before the intervention, the maximum number of students 62 (51.7%) in school 1 and 67 (55.8%) in school 2 were aware that blood vessels were affected by Hypertension whereas the least number of students 24 (20%) in school 1 and 29 (24.2%) in school 2 were aware of 'eyes' and 'heart' as the organs involved in Hypertension. As per table 5, 'regular blood pressure check- up' was the most common preventive measure known for Hypertension to 73 (60.8%) students in school 1 and 80 (66.7%) students in school 2 while the least known preventive measure in school 1 was 'decreasing salt intake' known to 53 (44.2%) students and the least known preventive measure in school 2 was 'weight control' known to 44 (36.7%) students. As per table 6, 'regular blood pressure check- up' as the treatment measure for Hypertension was known to the maximum number of students in both the schools

i.e., 72 (60.0%) students in school 1 and 85 (70.8%) students in school 2 while the least known treatment measure among students of school 1 was 'balanced diet' known to 51 (42.5%) students and in school 2 the least known treatment measure was 'decreasing salt intake' known to 55 (45.8%) students. There was a higher proportion of students with satisfactory level of knowledge of Hypertension after 2 weeks of intervention in school 1 i.e., 49.5% compared to 36.7% before intervention and the difference was found to be statistically significant (p value <0.05). Also there was a higher proportion of students with satisfactory level of knowledge of Hypertension after 3 months of intervention i.e., 51.1% in school 1 compared to 36.7% 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 Hypertension after 2 weeks of intervention in school 2 i.e., 75.7% compared to 59.2% before intervention and this difference was found to be statistically significant (p value <0.05). Similarly, there was higher proportion of students with satisfactory level of knowledge of Hypertension after 3 months of intervention i.e., 85.3% in school 2 compared to 59.2% before intervention and this difference was statistically significant (p value <0.05).

DISCUSSION

In our study 81.7% students in school 1 and 83.3% students in school 2 heard about Hypertension. In another study conducted by Sundar et al in 2013, in Chennai among students of class 8-12 of government and private schools, they found that only 28.25% had some awareness about HTN (Sundar et al., 2013) and in another 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 65.3% subjects had heard of Hypertension (Nair et al., 2015). Our study has found higher awareness because of different types of schools included in the former study and difference in methodology as to how information was elicited and inclusion of school drop-outs in latter study. In the current study 22.5% students in school 1 and 39.2% students in school 2 knew how Hypertension is caused whereas in a study conducted by Nair et al in 2015, 15.4% subjects knew that blood pressure rises to above normal in Hypertension (Nair, 2015). The difference in level of awareness may be because of difference in setting and methodology of the two studies.

In our study 6.7% students in school 1 and 2.5% students in school 2 knew normal blood pressure values. Chaudhari et al conducted a study in 2015 among students of higher secondary schools of Patan city, Gujarat. They found that baseline knowledge regarding normal blood pressure values was 67.2% (Chaudhari et al., 2016). This is much higher than in our study probably because students of higher classes were included in this study. In our study 67.3% students in school 1 and 63.3% students in school 2 knew that hypertension could be prevented. In a study conducted by Nair et al in 2015, in Delhi, only 14.9% subjects knew that HTN was preventable (Nair et al., 2015). The possible reason for the difference has already been discussed before. In our study in school 1, 'stress' as the risk factor of Hypertension was maximally known to the students i.e., 35.8% and in school 2 increased blood cholesterol was the maximally known risk factor of HTN known to 44.2% students. The least known risk factor of Hypertension in both the schools was 'family history of Hypertension', known

to18.3% students in school 1 and 15.8% students in school 2. In a study conducted by Nair et al in 2015 in Delhi, only 14.5% subjects knew that if parent was affected by HTN, then their child had a higher chance of getting HTN (Nair et al., 2015). In a study conducted by Chaudhari et al in 2015 in Gujarat, at baseline, maximum 65.5% students had knowledge of stress as the risk factors of Hypertension (Chaudhari et al., 2016). The least known risk factor in their study was lack of physical activity known to 21.6% students. In our study regular B.P. check- up was the most common preventive measure for Hypertension known to 60.8% students school 1 and 66.7% students in school 2. Also in our study regular B.P. check- up was the most common treatment measure for Hypertension known to 60.0% students from school 1 and 70.8% students from school 2. In a study by Nair et al in 2015, found that 42.1% subjects agreed that lifestyle modification helps in controlling / preventing HTN (Nair, 2015). In a study conducted by Chaudhari et al in 2015 in Patan city, Gujarat they found that baseline knowledge of the students regarding preventive measure of NCDs was maximum for meditation and avoiding smoking / alcohol consumption (11.2%) and the least was for avoiding junk food known to (5.2%) at baseline. In none of these studies students mentioned regular B.P. as response monitoring (Chaudhari et al., 2016). In our study, 36.7% students in school 1 and 59.2% students in school 2 had satisfactory knowledge score before intervention about the Hypertension. In our study, there was a higher proportion of students with satisfactory level of knowledge of Hypertension after 2 weeks and 3 months after intervention in school 1as wells as in school 2 and the difference was found to be statistically significant (p value <0.05).

Similar improvement has been observed by Chaudhari et al in a study conducted in 2015 in Patan city, Gujarat where baseline knowledge regarding normal blood pressure values was 67.2% which increased significantly to 99.1%. Similarly baseline knowledge of risk factors of Hypertension such as high salt consumption, obesity, stress, and lack of physical activity was 25.9%, 23.3%, 65.5%, and 21.6% respectively which significantly increased to 73.3%, 61.2%, 92.2%, and 45.7%, respectively after the intervention (single educational training with lectures, charts, demonstrations and discussion). Baseline knowledge of the students regarding preventive measure of NCDs such as meditation, avoiding cigarette smoking/alcohol consumption, and avoiding junk food was 11.2%, 11.2%, and 5.2%, respectively, which significantly increased to 40.5%,46.6%, and 37.9%, respectively, after the intervention (Chaudhari et al., 2016). In another interventional study conducted by Shah et al in from 2006 to 2008 among students of age 8-18 years in 3 cities of North India (New Delhi, Jaipur and Agra) they found that knowledge about blood pressure was 14-37% in government school at baseline which increased significantly to 44- 47% 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 (Shah et al., 2010). In a community- based multi- component nutrition and lifestyle intervention study, controlled trial conducted by Singhal et al in 2010 in North India, they found that knowledge of excess consumption of processed foods increase blood pressure increased from 66.7% at baseline to 76.8% in the intervention school after 6 months, however this was not statistically significant (Singhal et al., 2010).

Conclusion

From the results of our study, it may be concluded that IEC intervention improves the health literacy among school going adolescentsbe it in the form of didactic lectures, pamphlets or posters.

Recommendations

- Information, Education and Communication activities focusing on Health Literacy regarding lifestyle diseases like hypertension should be incorporated in school health programmes.
- 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 lecture or pamphlets and posters as both the forms of intervention were observed to be associated with statistically significant improvement in satisfactory level of knowledge after the intervention.

Conflict of Interest: None.

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