Impact of public education on rational use of medicines

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Abstract

Background: At present, the rational use of medicines is not promoted sufficiently. People use medicines as per their knowledge, perceptions, and habits.

Objectives: The present study aimed to evaluate the impact of public education on the rational use of medicines.

Materials and Methods: The study was randomized and controlled. It was conducted in households at sector 6, 8 and 10 of Nerul, Navi Mumbai. The study included 54 households in intervention group and 60 in controlled group. The intervention was providing education via information brochure containing information on rational use of medicines in the first visit. The households were interviewed using a pretested and validated questionnaire one month after circulation of the information brochure. Data was analyzed using SPSS version 24.0 at 95% level of significance with Fisher's exact test.

Result: The intervention group showed a significant improvement in correct knowledge of generic medicines, drug use in pregnancy, lactation and in children, precautions in the use of drugs in renal and hepatic disease and antibiotic use. Similarly, there was a significant improvement in the attitudes and practices of rational use of medicines.

Conclusion: Public education definitely leads to significant improvement in rational use of medicines. Information brochure is an effective tool of providing health related education to general public.

KEYWORDS: Antibiotic, Diabetes, Generic, Hypertension, Pregnancy

Introduction

The rational use of medicines (RUM) means– Patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community.[1,2] At present, the RUM is not promoted as much as other health programmes.[3] In India, only few studies are available on the public education interventions in rational drug use.[4-8] These studies proved that there is lack of awareness about many essential aspects about RUM namely, generic drugs, antibiotic use, pediatric medication, drug use during pregnancy and management of chronic diseases. To date, there has not been a comprehensive study conducted to examine the consumer knowledge and awareness on the RUM. Hence, this study is planned to assess the impact of public education on RUM.

Materials and Methods

The present study was randomized and controlled. The data collection method was a structured interview of household. The study design was based on the methods enclosed in World Health Organization (WHO) manual - How to investigate the use of medicines by consumers.[9] The inclusion criteria for the study were: 1. The household informant (HI) should be literate; 2. The HI should be willing to participate in the study; 3. The age of HI should be more than 18 years; 4. The HI should be the permanent resident of the present address; 5. The HI should satisfy at least three of the following criteria: a) Main health care decision maker; b) The HI should be knowledgeable about health of household members; c) The HI should be knowledgeable about health expenditures of the household; d) The HI should be knowledgeable about health utilization by household members; e) The HI should be designated care giver for sick household members. The exclusion criteria for the study were: 1. The adjacent households of the

interviewed household; 2. The HI of age more than 60 years; 3. The HI having some illness due to which he/she cannot recollect or remember the information or does not understand the questions. The study duration was two months from May 2015 to June 2015.

As per the manual for the household survey to measure access and use of medicines published by WHO, the questionnaire was prepared, pretested and amended.[10] The validity of this final version of questionnaire was checked by calculating Cronbach's alpha value (Cronbach's alpha coefficient = 0.87). The questionnaire comprised of socio-demographic characteristics of surveyed households and various questions based on the knowledge, attitude, and practices of the drug consumers about several issues of RUM.

Data Collection

The sample population by convenient sampling which includes the residential societies in sector 6, 8 and 10 of Nerul, Navi Mumbai in India were selected. The eligible household was randomized to enrol either in intervention or in controlled group. For the intervention group, the households received an information brochure on the RUM by the principal investigator (PI) at the first visit. In the second visit (2 days after the first visit), any query regarding the information was solved by the PI. On the third visit (30 days after the first visit), the questionnaire was administered by the PI to the HI. On the contrast, the questionnaire was administered at the first visit for the controlled group and HI received the information brochure after the interview. In this way, the knowledge to any group was not declined.

Ethical Considerations

The study was approved by institutional ethics committee (TMC/IEC/2014/03) and the informed consent was obtained from the HIs. The identity of all the households was kept confidentially. The study questionnaire did not produce any mental burden on the household informant. The voluntariness of the participant was respected by the PI.

Statistical Analysis

The data analyzed by Fisher's exact and McNemar's Chi square test for contingency type of data and unpaired t test for comparing means of two study groups using SPSS (v 24.0). A p value of less than 0.05 was considered significant.

Result

Total 60 and 54 households completed the study in controlled and intervention arms, respectively with 6 withdrawals in intervention group.

Socio-demographic Characteristics

Table 1 showed the comparison of socio-demographic characteristics between the two study arms and it was not significantly different except the total number of family members with p value <0.05 and t=2.28. However, this significance does not impact any other study findings.

Impact of Public Education

The number of households aware about the term 'Generic medicine' was significantly (p value <0.005) higher in intervention group (80% vs 28%) as compared to controlled group. On comparing the correct response of households between the two groups to the statements about various aspects of RUM, it showed higher correct response in the intervention group for all 35 statements while the difference was statistically significant for the 18 statements as depicted in Figure 1. There was statistical significance (p value <0.005) in number of households practicing self medication in pediatric age group as depicted in Figure 2. Out of 21 in controlled group, in 10 households the informant used to administer the drugs to children by just reducing the dose by half of the adult dose without consulting the doctor.

Discussion

According to the WHO, the information on the use of medicines should be provided, as a priority, to three categories of the public who would be able to create a difference. These are the patients who use the drugs, and thereby improve compliance, women and mothers who play an essential part in the health care of the family and lastly school children, the citizens of tomorrow, who must have a proper perception about the use of medicines.[3]

In present study authors tried to explore the impact of public education on the knowledge, attitude, and practice about the rational use of medicines. The impact can be best studied by using randomized controlled study design, hence the same design in the present study was opted. Total 60 and 54 households were completed the study in controlled and intervention arm, respectively. Among these groups, the mean age of informant was 36–40 years suggesting middle aged family member takes an important role in health related decisions in the present study population. Similarly, gender wise there were more women as health informant, indicating that women play a vital role in health care of family. Most of the household informants were at least completed their primary education. Hence, it was considered that they can understand the purpose of the study and their responsibility as participant in the present study. Most of the informants were being housewife; they were unemployed and belonged to lower economic state. Although, there was significant difference in the number of total family members among the two study arms, this difference did not influenced any other study findings. Similarly, the number of households in which any family member working in medical sector was comparable in both the groups (6 vs 8), thus it can be assumed that it did not improved the performance in intervention group.

Table 1: Socio-demographic characteristics

		Controlled (n = 60)	Intervention (n = 54)	p-Value
Age (Mean+-SD)		40.32 ± 1.68	36.85 ± 1.34	0.12$
Gender	Man	27 (45.00)	22 (40.74)	0.71#
No(%)	Woman	33 (55.00)	32 (59.26)	
Education	Primary	16 (26.67)	17 (31.48)	0.91 (df = 3)
No(%)	Secondary	16 (26.67)	12 (22.22)	
	Graduation	23 (38.33)	20 (37.04)	
	Post-graduation	05 (08.33)	05 (09.26)	
Occupation	Unemployed	29 (48.33)	26 (48.15)	0.74 (df = 3)
No(%)	Self employed	04 (06.67)	05 (09.26)	
	Government	07 (11.67)	09 (16.67)	
	Private sector	20 (33.33)	14 (25.93)	
Monthly income	<15,000/-	28 (46.67)	31 (57.41)	0.52 (df = 2)
No(%)	15,000-50,000/-	24 (40.00)	17 (31.48)	
	>50,000	08 (13.33)	06 (11.11)	
No. of family members	Total	4.12 ± 0.16	4.81 ± 0.27	<0.05*$
Mean+-SD	<6years	0.38 ± 0.08	0.56 ± 0.14	0.266$
	>65years	0.25 ± 0.07	0.22 ± 0.07	0.777$
No. of households in which any family member working in medical sector No(%)		06 (10.00)	08 (14.81)	0.57#

McNemar's chi square test applied, #Fischer's exact test, $Unpaired *t* test, df = degree of freedom *Statistical significance p value <0.05

Earlier education to the intervention group resulted in significant increase (23 *vs* 80%) in awareness about the term 'generic medicine' as compared to controlled. There was a significant improvement in the knowledge of generic medicines in intervention group as most of them opted the correct response to the statements on generic medicines such as agree for 'generic drugs are cheaper than branded', 'have equal quality' and 'should insist the pharmacist to provide generic drugs' while disagree for 'doctor should always prescribe branded medicines'.

Pregnancy and lactation are the common phases of life faced by the general public. Hence, awareness about the appropriate use of drug during these phases should be created. There was a significant expansion in the knowledge of drug use during pregnancy and lactation in intervention group.

In Indian scenario, generally most of the families are being joint have children and elderly people at home. It is expected to have high incidence of medical errors while administering drugs to children by their parents. In the present study it is found that there was significant difference in practicing self medication to children in the study groups with very less number of households practicing self medication to children and none of the household administered the drug just by reducing the dose to half in intervention group. Similarly, there was marked improvement in response to the statements on drug use in pediatric patients in the two study groups.

The prevalence of chronic diseases such as diabetes mellitus, hypertension, renal or hepatic disease is higher and rising in elderly age group. Hence, the education on the management of these chronic diseases is a need of this genre. In the present study, it is observed that the prevalence of diabetes mellitus and hypertension was higher in controlled group indicating the presence of knowledge about the disease related management in the group. Thus the pre-education to intervention group failed to generate statistically significant difference in the response to the statements on management of diabetes mellitus and hypertension. But, there was significant improvement in the intervention group on the response to the statements on renal and hepatic diseases.

There is higher incidence of communicable disease in India and most of the population is already exposed to antibiotics leading to rise in the development of antibiotic resistance. Hence, the appropriate use of antibiotics should be known to the general public. In this study, it is found that pre-education on appropriate antibiotic use significantly improved the knowledge and positively changed practices in intervention group when compared to controlled group in terms of only one case of common cold consumed antibiotics in intervention group as compared to 18 in controlled group and relatively more correct response to the statements on antibiotic use in intervention group.

To summarize, the intervention group showed a significant improvement in correct knowledge of generic medicines, drug
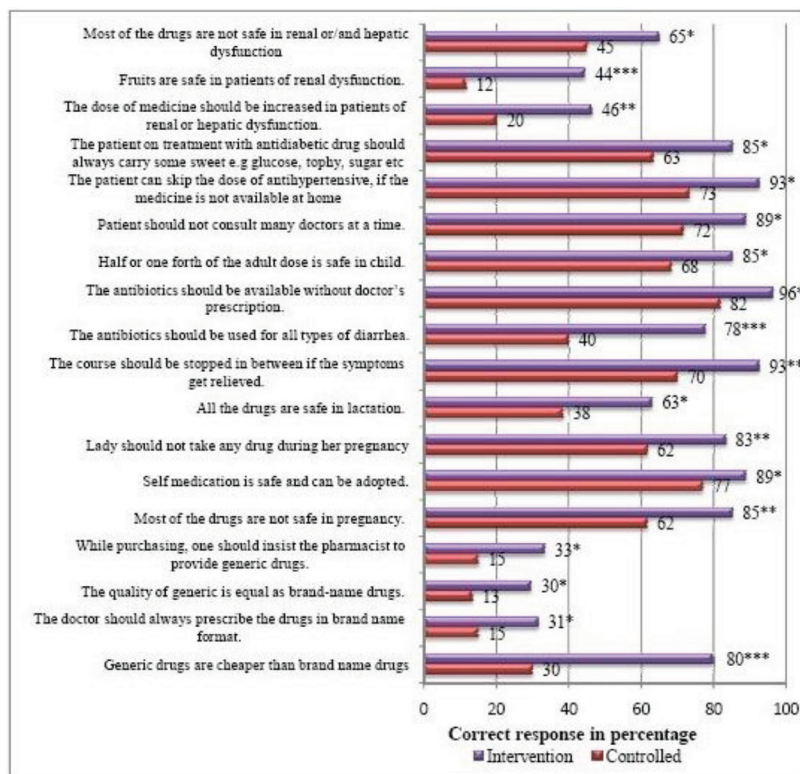
Figure 1: Statements which showed statistically significant difference in the correct response (%) among the two study groups (Fisher's exact test applied, * statistical significance *p* value <0.05, ** statistical significance *p* value <0.01, *** statistical significance *p* value <0.005)
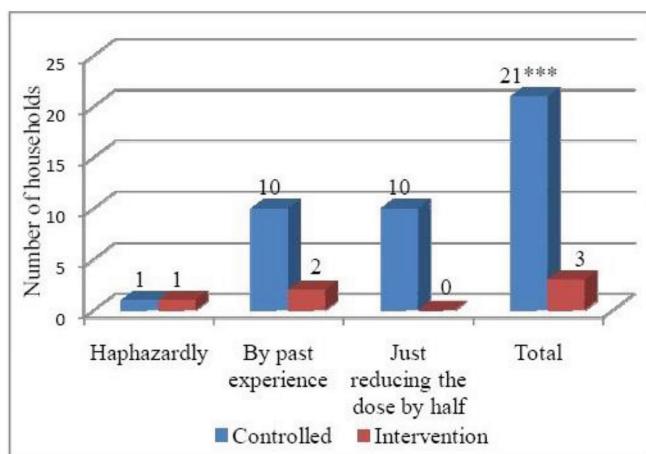

Figure 2. Bar diagram showing the number of households practicing self medication in children among both the study groups (Fisher's exact test applied, *** Statistical significance *p* value <0.005)

use in pregnancy, lactation and in children, precautions in the use of drugs in renal and hepatic disease, and antibiotic use. Similarly, there was a significant improvement in the attitudes

and practices of RUM in terms of- awareness about self medication and expiry period; adherence to doctors' advice; avoiding antibiotics to treat diarrhea and common cold, self medication during pregnancy, lactation and in children, and consulting many doctors for management of chronic disease; keeping glucose supplements handy by diabetic patient in the intervention group. Thus, it was demonstrated that there was significant improvement in intervention group due to the prior education on RUM. Similar results were reported by several previous studies.[4-8,11-13] The educational tool as information brochure had been an effective method in improving knowledge of participants in intervention group and promoting the RUM.

Limitations

Less sample size is one of the limitations of the present study but, it was unfeasible to increase the sample size due to constrained time (study duration as two months only). Secondly, there were 6 withdrawals in intervention group. Instead of intention to treat (ITT) analysis, it is considered the sample size as 54 and analyzed the findings. Lastly, the long term effects of the education and the benefits accruing from this improved level of knowledge have not been studied in either therapeutic or economic terms.

Conclusion

Public education definitely leads to significant improvement in rational use of medicines. Information brochure is an effective tool of providing health related education to general public.

Acknowledgements

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