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PROSPECTIVE SURVEY STUDY ON ASSESSMENT AND EDUCATION OF HOME MEDICINE CABINET IN GENERAL POPULATION OF COMMUNITY

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ABSTRACT

Objective: To assess and educate about home medicine cabinet among randomly selected houses of people in community of Greater Noida city & to carry out the survey of medicines proper storage, safe use, list of total and expired drugs, their disposal and maintenance of home medicine cabinets.

Method: This study was a simple randomised prospective survey study. This prospective study was carried out for a period of six months in selected areas of Greater Noida City. The study site was the homes sited in those areas by simple randomization.

Key findings: Randomly selected 102 houses were visited to educate and assess the people about Home Medicine Cabinet. A total of 392 people were surveyed in 92 houses with exception of 10 houses. During the period of the study, most of the expired drugs are in the category of analgesics and NSAID's (23.93%) followed by nutritional supplements (22.56%), antibiotics (14.94%), expectorants and mucolytics (6.77%), bronchodilators (5.31%) and antacids (6.53%),Number of House members involved in self medication decreased from 72 houses (78.26%) to 25 houses (27.17%). Number of House members involved in self medication decreased from 72 houses (78.26%) to 25 houses (27.17%). No. of people checking expiry dates increased from 58 (63.04%) to 84(91.30%). No. of expired medicines decreased from 297 (19.69%) to 72 (4.77%) and Cost of expired medicines decreased from 2034.39 (22.05%) to 545.7(4.98%) Which are statistically significant with P value<0.05.

Number of people made aware about the proper disposal methods for different categories of medicines increased from 58 houses (63.40%) to 79 houses (85.87%).

Conclusions: In conclusion, the results of this study demonstrate the need for interventions in health education. This can promote rational use of medications, safe storage, and proper disposal of expired or unused medicines prevention of domestic accidents involving children by keeping medicines out of their reach. This study tried to cover these aspects by educating and which can be addressed by further intervention or education.

INTRODUCTION: Estimates produced by the world health organization (WHO) indicate that 50% of all medication taken worldwide is prescribed, dispensed, sold or used incorrectly; 66% of antibiotics sold are bought without prescriptions, and incorrect use of medication is one of the top ten causes of mortality. Developed countries and those in development have invested in programs with the objective of reducing irrational drugs use and waste, employing with the support of the WHO, regulatory measures are aimed at promoting rational use of medicines. Of note among these measures, are licensing of medications based on evidence that they are safe, effective and of good quality. Development of home medicine cabinets may, possibly reduce 'pressure' on health systems [1].

The storage of unnecessary medicines either expired or no longer used by patients or improperly stored poses several safety concerns over patient confusion, inappropriate medication use and unintentional ingestion by children. This may lead to patients identified at risk of medication misadventure / misuse and wastage of medicines [2]. Increased pharmacists involvement in self- care can improve adherence to drug therapies, resulting in improved efficacy. It also can minimize the risk of drug interactions and side effects. Ultimately pharmacists can guide patients to take wiser health care decisions [3].

The disposal of unwanted medicines from households is becoming an increasing problem for local and national health and environmental authorities. Direct risks of unsafe disposal such as inappropriate medicine sharing, childhood poisonings and diversion of medicines to illicit use have been recognized for some time and environmental concerns are now receiving prominence [5].

The majority of medication safety research and published health care literature has focused on hospital or ambulatory settings where patient care is provided at a site away from the home. But many medication errors occur in the home, and these errors need to be analyzed to help develop the strategies that will improve safe medication use throughout the continuum of health care [6].

During the home visit, potential medication-related risk factors such as poor adherence, expired medications, number of prescribers and dispensers were found. For all medications found in the home, medication hoarding, multiple storage locations of medication, lack of a medication administration routine, presence of discontinued medication repeats, and the Patient's understanding of generic versus trade names was identified [9].

Unused medicines pose a risk to public health through poisoning and suicide when allowed to accumulate in the home and to the environment through poor disposal[2-4]. Therefore, minimizing the quantity of unused medicines generated and ensuring the safe disposal of unavoidable unused medicines is an important public health concern [10].

Furthermore, the increasing trend of direct-to-consumer advertising needs to be addressed dispassionately by all stake-holders to avoid stockpile of medicines at homes. The unbridled direct-to-consumer advertising is a major cause of inappropriate self medication by the public. Perhaps one need not lose sight of the literacy rates as a contributing factor to the problem of unused/unwanted medicines at homes. The need for health education and health literacy is critical for preventing the problem of unused/unwanted medicines at homes.

Polypharmacy (where a patient is required to take many medicines everyday) could really pose challenges to the person particularly for the aged and result in non-compliance [11]. Each year hundreds of people are admitted to hospitals as a result of inappropriate ingestion of medications. Non-compliance with prescription directions is a particular problem among the elderly.

Self-medication is one of the major problems resulting in improper or unnecessary consumption of drugs. Self-medication is defined as obtaining and consuming drugs either for a medical problem without the advice of a physician. It is common both in developed and developing countries.

Particularly in developing countries, self-medication usually leads to inadequate drug utilization patterns. Additionally, it is especially worrisome when it involves specific diseases (e.g. diarrhoea) or prescription drugs such as antibiotics [1, 2]. In 2000, the World Health Organization produced guidelines for the Deficit Reduction Act (DRA) in evaluating medicinal products for self-medication use. It clarified the definition of over-the-counter drugs (OTC), drug classification criteria, and information on drug labels and leaflets inserts [12].

In view of the above needs, in combination with the fact that studies investigating the characteristics of home medicine cabinets are rare both nationally and internationally, and to create awareness among the community, it is essential to 'educate before you medicate'. Hence, thought of carrying out the prospective survey study on assessment and education of Home Medicine Cabinet among general population of community.

MATERIALS AND METHODS: This study was a simple randomised prospective survey study. This prospective study was carried out for a period of six months in selected areas of Greater Noida City. The study site was the homes sited in those areas by simple randomization.

People among community were selected by considering the following criteria:

Inclusion criteria**:**

- Houses with drugs stored.
- People who can read and write.

Exclusion criteria:

- Houses or community areas not willing to participate in the study**.**

Study Materials:

- Patient data collection form
- Questionnaire for assessing about Home Medicine Cabinet.
- Information Leaflet's for educating about Home Medicine Cabinet.
- Sample of medication record.

Statistical analysis: The details were reanalyzed and reassessed after education and also compared with the baseline data. Statistical analysis of the same was done by t-test and Wilcoxon signed rank test to compare the baseline data's of before and after education of the prospective survey study.

RESULTS AND DISCUSSION: Randomly selected 102 houses were visited for the prospective survey study of educating and assessing about Home Medicine Cabinet among randomly selected areas of Belgaum city.

A total of 392 people were surveyed in 92 houses with exception of 10 houses (5 houses were not having medicines and in another 5 houses survey could not be conducted).

Gender wise distribution of total population: In the surveyed people, ratio of male population is 144 (36.73%) compared to female 133 (33.93%) followed by children 115-29.34 % 12 years and below (**table 1, fig. 1**).

TABLE 1: GENDER WISE DISTRIBUTION OF THE TOTAL POPULATION (n=392)

Gender	Number of persons (n = 392)	Percentage
Age > 12 years		
Male	144	36.73%
Female	133	33.93%
Children (< 12 years)		
Male	69	17.6%
Female	46	11.74%

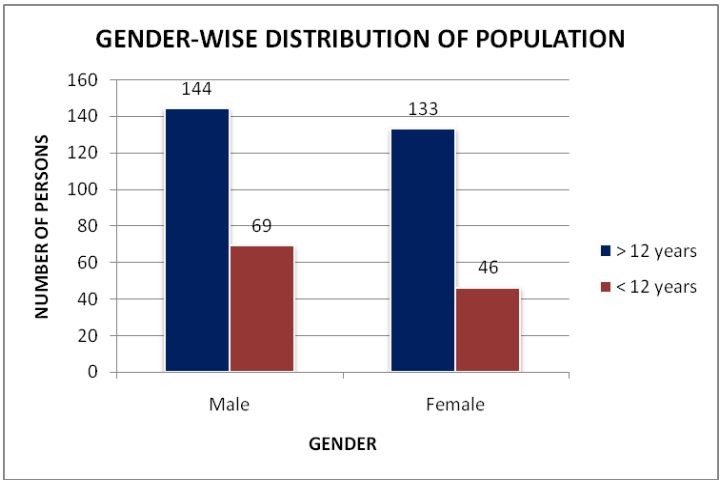

FIG. 1: GENDER WISE DISTRIBUTION OF THE TOTAL POPULATION (n=392)

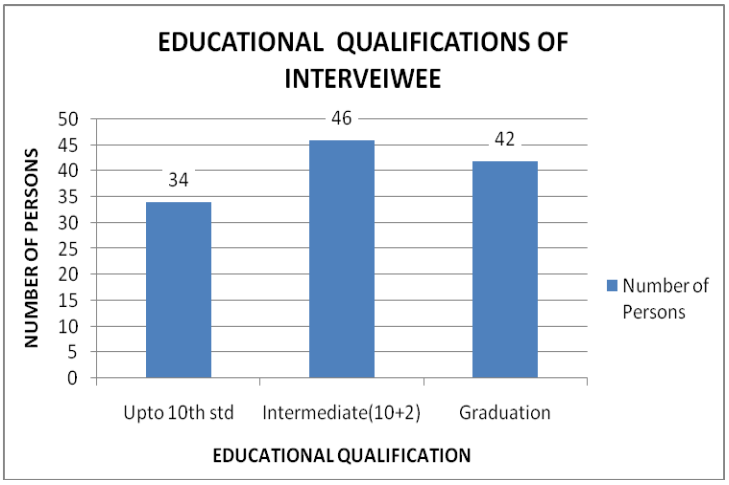

FIG. 2: EDUCATION BACKGROUND DISTRIBUTION OF INTERWEE FROM THE TOTAL POPULATION (n=124)

Gender-wise distribution of interviewee: In the survey, among interviewed population (n=124), number of females contribute to 90 (73.58%) compared to males 34 (27.42%) (**table 2**).

TABLE 2: INTERVIEWEE DISTRIBUTION FROM THE TOTAL POPULATION (n=124)

Interviewee	Number of persons	Percentage
Male	34	(27.42%)
Female	90	(73.58%)

Education background wise distribution of interviewee from the total population (n= 124): The people who were included in the study were literate who could read and write. Accordingly, the prevalence of education qualification hierarchy is more in 10+2(37.09%) followed by Graduates (35.49%) and then 10thstd. and below (27.42%) (**table 3, fig. 2**).

TABLE 3: EDUCATION BACKGROUND DISTRIBUTION OF INTERVIEWEE FROM THE TOTAL POPULATION (n=124)

Education	Number of persons	Percentage
Up to 10th std	34	(27.42%)
Intermediate(10+2)	46	(37.09%)
Graduation	42	(35.49%)

Baseline Data:

Number of houses having medicines in the home: Out of 102 houses visited, 92 (90.20%) houses were having medicines. 5 houses (4.90%) were not having medicines and in 5 houses (4.90%) survey could not be conducted as they were not willing to participate (**table 4**).

TABLE 4: NUMBER OF HOUSES HAVING MEDICINES IN HOME (n=102)

	Number of houses	Percentage
Having medicines	92	90.20
Not having medicines	5	4.90
Could not be surveyed	5	4.90

Number of houses with medicines where Expiry Date is checked before medicine is being consumed and the disposal of expired drugs (n=92): Out of 92 houses, members of 58 houses (63.04%) checked for expiry date before consuming medicine and members of 34 houses (37.06%) did not check (**table 5**).

TABLE 5: NUMBER OF HOUSE MEMBERS CHECKING FOR EXPIRY DRUGS

	Number of houses	Percentage
Checking for expiry drugs	58	63.04%
Not checking for expiry drugs	34	36.96%

It was found that 297 drugs (22.05%) had expired apart from 13 drugs (approximately 3.60%) could not be accounted due to unavailable expiry date. The Expired Cost contributed to Rs. 2034.39 (22.05%) and near expiry drugs cost Rs. 358.82 (03.89%) compared to total cost Rs. 9225.27 (**table 6**).

TABLE 6: COST OF EXPIRED AND NEAR- EXPIRED DRUGS

	Cost in Rupees	Percentage
Expired drugs	2034.39	22.05%
Near expired drugs	358.82	03.89%
Non expired drugs cost	6832.03	74.06%
Total cost of all the drugs	9225.27	100.00%

Of the study, most of the expired drugs are in the category of analgesics and NSAID's (23.93%) followed by nutritional supplements (22.56%), antibiotics (14.94%), expectorants and mucolytics (6.77%), bronchodilators (5.31%) and antacids (6.53%) (**fig. 3**).

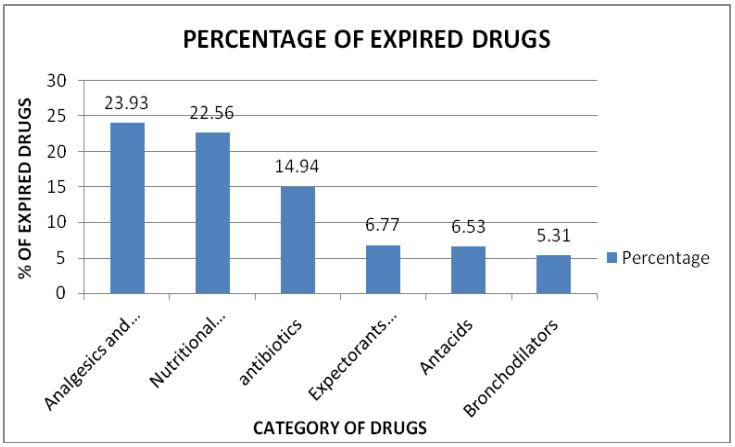

FIG. 3: CATEGORY OF EXPIRED DRUGS (N=323 DRUGS):

In 34 houses (37.06%) expiry date was not noticed. Those medicines were not consumed when there was change in the colour, in 16 houses (47.06%), change in the taste, in 10 houses (29.41%) or unwrapped medications, in 06 houses (10%) and all of them were discarded in dustbins and few flushed in the toilets , in 02 houses (2.01%) (**table 7**).

TABLE 7: NUMBER OF HOUSES WITH HOME MEDICINE CABINETS

	Number of houses	Percentage
Having home medicine cabinets	48	52.17%
Not having home medicine cabinets	44	47.83%

Among 44 houses, 14 house members (31.81%) placed them in the kitchen, followed by 15 (34.09%) in the bedroom and 11 (25%) in the cupboards (2 in bathroom cupboard). Other 04 (9.09%) kept the medicines in various unlikely places like, among vegetable basket, along with detergents, under the beds or inside pillow covers (**fig. 4**).

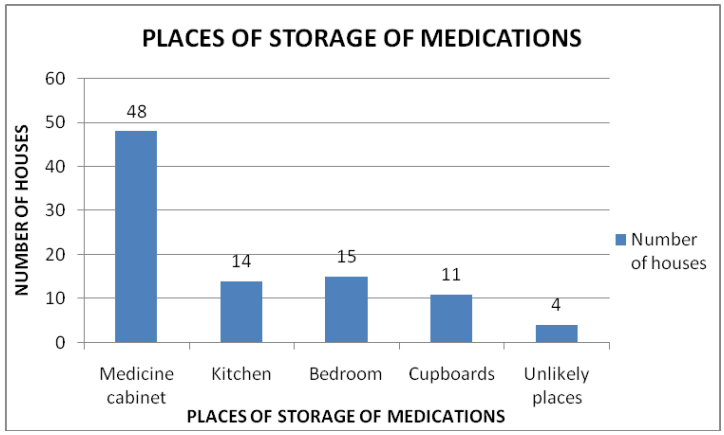

FIG. 4: NUMBER OF HOUSES WITH/WITHOUT HOME MEDICINE CABINETS AND THE STORAGE PLACES (n=92)

Number of houses involved in self-medication: In the study, out of 92 houses, 72 house members (78.26%) are involved in self medication and 20 house members (21.74%) were not involved in self medication (**table 8**).

TABLE 8: NUMBER OF HOUSES INVOLVED IN SELF-MEDICATION (N=92)

	Number of houses	Percentage
Involved in self medication	72	78.26
1. Whenever I feel	09	09.78
2. Occasionally	63	68.48
Not involved in self medication	20	21.74

TABLE 9: COMPARISON OF COST OF EXPIRED DRUGS BEFORE AND AFTER EDUCATION

Formulations	Before education		After education	
	Quantity	Cost	Quantity	Cost
Tablets	266	1095.26	58	212.65
Syrup	10	332.41	4	91.25
Capsules	9	81.77	4	35.75
Suspensions	2	66.5	1	88

Powder	1	25.75	1	20.25
Eye drops	3	99.75	1	26.5
Gel	1	42.75	1	32
Churna	2	237.75	1	20.8
Cream	1	19.7	0	0
Ear wax softener	2	32.75	1	18.5
Total	**297**	**2034.39**	**72**	**545.7**
Mean	**29.7**		**7.2**	

Wilcoxon signed-ranks test: SD of mean of Before Education and After Education = 22.50 ±65.21 and P < 0.05 Significant

DISCUSSION: A total of 392 people were surveyed in 92 houses with exception of 10 houses (5 houses were not having medicines and in another 5 houses survey could not be conducted). In the surveyed people, ratio of male population is 144 (36.73%) compared to female 133 (33.93%) followed by children (29.34%-12 years and below) matches approximately as per the Greater Noida census (as of 2001 census, males were 51% and females 49% and 11% children under the age of 6 years) **(Table 1)**. In the survey, among interviewed population (n=124), number of females contribute to 90 (73.58%) compared to males 34 (27.42%), the reason being most of the females are housewives and survey was carried during the office hours and working days. Some of the working people were also present due to some off duty hours or for personal reasons **(Table 2).**

The average time taken doing the survey per house was 55 minutes as to build up the faith between the investigator and the interviewee followed by assessing and educating the people regarding Home Medicine Cabinet also carried out the survey of medicine's proper storage, safe use, list of total and expired drugs and maintenance of home medicine cabinets using the Patient Information Leaflets (PIL'S) [11].

Baseline Data: 0ut of 102 houses visited, 92 (90.20%) houses were having medicines. 5 houses (4.90%) were not having medicines and in 5 houses (4.90%) survey could not be conducted as they were not willing to participate.

No. of Houses with Medicines (n=92) where Expiry Date is checked before medicine is being consumed and the disposal of expired drugs:

Out of 92 houses 58 house members (63.04%) checked for expiry date and 34 house members (37.06%) did not check. even if the expiry dates will be known for certainty, drugs, which are stored at home for a long time, are likely to deteriorate even before their official expiry dates due to un-conducive storage conditions in the houses. It was found that 297 drugs (25.82%) had expired apart from 13 drugs (app. 3.60%) could not be accounted due to unavailable expiry date. The Expired Cost contributed to 2034.39 Rs. (25.82%) and near expiry drugs cost (05.25%) compared to total cost 6834.81 Rs. The expired quantity cannot be exactly calculated in some preparations like syrups, half opened containers, unavailable expiry dates and further it may add up the cost **(Table 9)**.

Of the study, most of the expired drugs are in the category of analgesics and NSAID's (23.93%) followed by nutritional supplements (22.56%), antibiotics (14.94%), expectorants and mucolytics (6.77%), bronchodilators (5.31%) and antacids (6.53%) **(figure 3)**. This may possibly explain the use of OTC drugs and nutritional supplements available over the counter for common ailments avoiding the physician's visit and discontinued when Combination preparations containing 'hidden' classes of drug are prescribed. Food supplements and tonics of dubious nutritional and pharmacological value make up a high proportion of the total drugs. The major reasons why families stored drugs at home included: the need to store them for future uses, self-medication, discontinuation after healing, and unknown reasons.

CONCLUSION: In this study, medicines were placed in various unlikely places like, among vegetable basket, along with detergents, under the beds or inside pillow covers. Many of these locations signal potential safety risks for children, as well as concerns about the integrity of the medication and memory challenges for

dose administration. Some quantities could not be exactly calculated in some preparations like syrups, half opened containers, unavailable expiry dates and further it may add up the cost.

In conclusion, the results of this study demonstrate the need for interventions in health education. This can promote rational use of medications, safe storage, proper disposal of expired or unused medicines prevention of domestic accidents involving children by keeping medicines out of their reach. This study tried to cover these aspects by educating and which can be addressed by further intervention or education.

Information provided in the survey can help health care professionals tailor their care (e.g., education, support, treatment, and referrals) to an individual's personal needs. Also, health planners need this crucial information to develop future programming that can reduce unintentional poisonings in high-risk populations like younger children and older adults.

These studies suggested that there was wide responsibility for the pharmacist to conduct like this educational survey programmes to the people regarding a safe medication use and checking/cleaning their medicine cabinets periodically. From this it is concluded that the in home drug storage habits were improved by conducting like this educational survey programmes both among urban and rural population.

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