A Study to take Account of Scientific Management of Waste Generated during Patient Care by General Practitioners in Mumbai City, India

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ABSTRACT

It has been mentioned that scientific management of waste generated during patient care is essential as well as a legal liability of the generator. Unfortunately, complacency and inadequate knowledge followed by practice for waste disposal leads to various kinds of community and individual health and environment issues which are detrimental to the human life. The present study is aimed to take an account of scientific knowledge and it's practical applicability of BMW among the general practitioners of Mumbai city in India. In the present study general practitioners in Mumbai city were visited and interviewed personally and also administered questionnaire in order to analyse biomedical waste management by general practitioners. 37 (30.8%) belongs to age group 14-50 years followed by 30-40 years (30%). The percentage of male (64.1%) is more than female (35.8%) practitioners. The qualification ranged from BHMS, BAMS, MBBS to MD of which majority ware medical graduates (40.8%). 66.6% practitioners had average while only 23.3% has good knowledge about proper waste management. Maximum concern was shown towards the safety where it scored 80% followed by waste generation (62%), definition (51%), transportation (46%), Colour coding (34%). The study brought out the facts that the deficiency of knowledge and practices of waste management were the main reason for non scientific management of waste generated by general practitioners thus exposing self as well as community at large to health and environment hazards.

INTRODUCTION

Biomedical waste is the unwanted materials generated during diagnosis, treatment, operation, immunization and research activities. These wastes are potential source of infections namely HBV, HCV, HIV, and tetanus. It has been estimated that around 1.45 kg waste is generated per patient per day in Indian hospitals (4.5 kg in developed countries) .[1] Out of this quantity about 15-20% of this total waste is hazardous,[1] while in India the percentage might be much higher of lack of proper and scientific waste segregation and waste disposal methods. Extensively reported in country's print media that re-use of disposable syringes, needles, catheters, bags, drug vials, bottles, and intravenous drip sets are picked up by rag pickers and purchased by duplicators, recycled, replaced without proper treatment.[2] It is also noted that the maintenance of the incinerators used by some of the hospitals is so poor that instead of helping the clean environment they contribute to pollute the environment because of improper segregation of the wastes used in incinerators.[3] The 'Bio-medical waste (management and handling) Rules 1998' was enacted in 1998 and got amended thereafter various times, lastly in 2003 . Any violation of the rules by any person is punishable with fine or imprisonment under the Environment protection Act 1986.[2] In India health care providers may be having adequate knowledge, but the practices are deficient and inappropriate due to lack of proper facilities, interest of the individual

or inadequate knowledge. With this view the present study was done to take account of knowledge and practice on bio-medical waste management among general practitioners in Mumbai city, India.

Therefore, knowing the present status of locally based healthcare providers awareness regarding BMWM will help the authorities to revise and redo the strategy for improving the situation in future.[4,5,6]

Study objective
1.   To identify the average knowledge level of biomedical waste management among general practitioners.
2.   To identify the level of practices of biomedical waste management by general practitioners.
3.   To recommend system to optimize the scientific management of biomedical waste to prevent transmission of waste related infections in the community.

Scope of the study
Scientific management of biomedical waste is very vital step in prevention of infection transmission. There is increasing concern about increasing load of biomedical waste in public. Though the knowledge is there however the conversion of such knowledge in to practice is the essence of scientific management of biomedical waste. There is inverse relationship between transmission of disease and level of management.

The study is an attempt to reveal the correct picture of current scenario about biomedical waste management among general practitioners so as to take necessary steps to improve it's management.

METHODOLOGY

Study Design
Descriptive cross sectional study aimed at evaluation of knowledge and practice about biomedical waste management among general practitioners.

Study period
The study was conducted from December 2013 to April 2014.

Sampling Method
Non probability convenient sampling method was used.

Sample Size
Total 120 General Practitioners were included in the study.

Data collection tools
After a brief discussion with General Practitioners regarding objective of study and gaining their confidence regarding confidentiality a verbal permission was obtained for their participation in the study. The tools involved in the study was semi structured self administered questionnaire by the general practitioners.

Limitation of study
1.   Study may not be representative of country as it was done in only one city.
2.   Study generability may not be apparent as convenient sampling was done.

Data analysis
The data obtained were analyzed using descriptive statistics with help of SPSS and data was summarized using a combination of tabulated description like tables,graphs and charts. The data was also summated to statistical commentary.

RESULTS AND DISCUSSION

The data obtained and analysed were presented in tabulated form bearing titles based on the data being present there.

Table-1 shows that majority of the practitioners 37 (30.8%) belongs to age group 14-50 years followed by 30-40 years (30%). The percentage of male (64.1%) is more than female (35.8%) practitioners. The qualification ranged from BHMS, BAMS, MBBS to MD of which majority ware medical graduates (40.8%). The details of duration of practice showed that 40 (33.3%) were in practice for less than 10 years while 16 (13.3%) were in practice for more than 30 years.

Results in Table 2 shows distribution of knowledge and practice scores. The knowledge was distributed with a mean of 16.23, median 17, S.D.

4.11 and range was 14. The Practice of biomedical waste management at their clinic was with the mean of 13.02, median 15.00, S.D. 3.29 and range was 12.

The Table 3 shows that the 66.6% practitioners had average while only 23.3% has good knowledge about proper waste management. Similarly Table 4 shows that the knowledge is not getting converted in to practice as 33.3% followed

Table 1: Socio Demographic Variables of General Pratitionerss (N=120)

Demographic Variables	Frequency	Cumulative Frequency	Percentage (%)	Cumulative Percentage (%)
Age (Yrs)				
30-40	36	36	30	30
41-50	32	68	26.6	56.6
51-60	37	105	30.8	87.4
>60	15	120	12.6	100
Gender				
Male	77	77	64.2	64.2
Female	43	120	35.8	100
Qualification				
MD	18	18	15	15
MBBS	49	67	40.8	55.8
BAMS	34	101	28.3	84.1
BHMS	19	120	15.9	100
Years of Experience				
Less than 10 yrs	40	40	33.3	33.3
11-20 years	36	76	30.0	63.3
21-30 years	28	84	23.3	86.6
More than 30 yrs	16	100	13.4	100

Table 2: Distribution of descriptive statistics for Knowledge and Practice of Biomedical Waste Management

Overall Score	Mean	Median	SD	Range
Knowledge	16.23	17.30	4.11	14
Practice	13.02	15.00	3.29	12

good practice of management while 11.6% had poor practice of waste management generated in their clinics.

The table 5 depicts the analysis of various components of waste management practices. Maximum concern was shown towards the safety where it scored 80% followed by waste generation

Table 3: Distribution of knowledge Score of participants for BMWM. (N=120)

Level of Knowledge	Score Range	Frequency	Percentage (%)
Good	19-22	28	23.3
Average	12-18	80	66.4
Poor	10-11	12	10.0

Table 4: Distribution of Practice Score of participants for BMWM. (N=120)

Level of Practice	Score Range	Frequency	Percentage (%)
Good	19-22	40	33.4
Average	12-18	66	55.0
Poor	10-11	14	11.6

**Table 5: Association between selected socio demographic
variables and knowledge scores about BMWM. (N=120)**

Demographic Variables (number of study participants)	Good	Average	Poor	Chi-square Calculated	Tabulated
Age in years					
30-40(36)	9	24	3		
41-50 (32)	2	29	1	3.015	12.592
51-60 (37)	10	24	3		
>60 (15)	2	12	1		
Gender					
Male (77)	18	53	5	0.079	5.991
Female (43)	10	27	7		
Qualification					
MD (18)	6	10	2		
MBBS (49)	15	28	5		
BAMS (34)	7	23	4	5.404	12.592
BHMS (19)	6	11	3		
Years of Experience					
<10 years (40)	8	30	2		
11-20 years (36)	9	26	1	9.130	12.592
21-30 years (28)	2	24	2		
>30 years (16)	3	12	1		

**Table 6: Association between selected socio demographic variables
and practice scores about BMWM.(N=120)**

Demographic Variables (number of study participants)	Good	Average	Poor	Chi-square Calculated	Tabulated
Age in years					
30-40(36)	8	22	6		
41-50 (32)	1	28	3	5.363	12.592
51-60 (37)	19	22	6		
>60 (15)	2	10	3		
Gender					
Male (77)	17	50	10		
Female (43)	7	26	10	0.383	5.991
Qualification					
MD (18)	5	9	4		
MBBS (49)	12	24	13	3.348	9.488
BAMS (34)	6	21	7		
BHMS (19)	7	10	2		
Years of Experience					
<10 years (40)	5	28	7		
11-20 years (36)	7	23	6	17.96	12.592
21-30 years (28)	1	22	5		
>30 years (16)	1	10	5		

(62%), definition (51%), transportation (46%), Colour coding (34%).

The Table 6 shows calculated chi-square values which were less than tabulated values for sociodemographic variables which indicates that there is no significant association for any of the selected socio-demographic variables.

With the help of available statistical information the correlation between knowledge and practice were analyzed by Spearman's Rank correlation method, and it was found that there was positive correlation between knowledge and practice at *P*<0.012. This indicated that the practices of health care providers on bio-medical waste management were influenced by their level of knowledge. This result indicates that that the knowledge about waste management possessed by General Practitioners was not dependent on any of the socio-demographic variables.

For the purpose of studying association between sociodemographic variables and practice scores there is no significant association was found with these demographic variables. But the calculated chi-square value (17.96) for total year of experience was more than tabulated value which indicate significant association between practice and total year of experience. This finding indicated that the practices regarding scientific way of managing biomedical waste remain dependent on years of experience as the experience increased the safer they wish to be in their practices.

CONCLUSION

The study besides the statistical results it provided the following information about the knowledge and practices of biomedical waste management by General Practitioners of Mumbai city. It is noteworthy that care providers should have proper knowledge and adequate practice bio-medical waste management in better way to protect self, the community and more importantly the environment.

It is also to be stressed that awareness and knowledge has its own limitations and Its application is solely dependent on the level of knowledge the subject possesses however these limitation should not deter medical professionals to adapt the scientific process of biomedical waste management. Alas, periodical education will also enhance the practices of the proper bio-medical waste management.

It is imperative that active participation in knowledge sharing be encouraged among General practitioners. Various research activities are being undertaken to know the hazardous effects caused by unscientific management of biomedical waste and their prevention among health care providers. The information provided by helps healthcare providers to focus on health hazards from the waste and lays foundation upon which the new scientific knowledge is based.

Because of the small sample size the broad generalization could not be made and needs further study with large sample size so as to make generalized conclusion.

The research base can further be broaden by performing comparative study at different levels and with different categories of healthcare providers. With the recommendations of establishing bio-medical waste management control committee to lay down the policies regarding management and team to monitor the activities among medical professionals is pertinent.

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