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"EFFECTIVENESS OF VIDEO ASSISTED TEACHING PROGRAM REGARDING KNOWLEDGE AND PRACTICE REGARDING BIOMEDICAL WASTE MANAGEMENT GUIDELINES AMONG BIOMEDICAL WASTE HANDLERS"

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ABSTRACT

Background: *In day today most of the biomedical waste handlers are unaware of newer guidelines 2016. There is a need of training regarding newer guidelines 2016 on biomedical waste management to biomedical waste handlers for improving their week efficiency and adoption newer guidelines for safe practice of biomedical waste management therefore by improving the safety exposed to the infectious and toxic waste of the hospital.*

Objective: *1.To assess the status of knowledge and practice among biomedical waste handler regarding new guidelines 2016 biomedical waste management. 2. To assess the status of knowledge and practice biomedical waste handler regarding new guidelines of biomedical waste management of after learning package.*

Methods and materials: *One group pretest posttest research design was used and samples were selected by using non-probability purposive sampling technique. The sample size was 55 biomedical waste handlers and sweepers working in various wards and department of BMWM KH and MRC, Karad. Before practices of handlers was observed and pretest was conducted before administering video assisted teaching and structure lesson plan and post test was conducted after 7 day, and post observation was done.*

Results: *Present study showed that pre-test mean score of total knowledge was 10.96 and post-test it was increased up to 18.72 and practice score was increased from 16.09 to 19.36. The paired't' test was used for this study. The p value < 0.0001 which is considered to be Extremely Significant so it indicated that video assisted teaching programme was effective for improving knowledge and practices of biomedical waste handlers and there*

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was significant association between age and gender and knowledge but there was no significant association with practice of biomedical waste handlers. There was a no significant association between education, income, experience and training and knowledge and practice regarding BMWM according to (2016) guidelines.

Conclusion: *Based on the analysis of findings it was shown that increase in the knowledge and practice scores of biomedical waste handlers after administration of video assisted teaching program.*

Key words: *Biomedical waste, Knowledge, Practice, Handlers.*

I. Introduction:

Biomedical Waste Management Rules in 2016 are also notified by Central Government dated on 28th Mar 2016. For implementing the new laws every state's Pollution Control Board or Pollution control Committee are responsible.

In our country India, various clinics use different methods to handle these waste which are handled haphazardly, it can be more harmful. Inappropriate waste disposal can lead to various life threatening diseases to human. Many unregistered hospitals produced waste which is more dangerous [1].

Due to improper management of waste disposal and products; medical wastes can be hazardous to the whole ecosystem and environment. BMWM is main aspect ofinfection control policy. The risk of injury increases if this waste is not handled properly [2].

Total bio-medical waste generation in the India is 484 tons per day from 1,68,869 healthcare facilities. Out of that 447 TPD biomedical waste is treated by various disposal methods and 37 TPD is remains untreated information given by government [3]. The counting of waste produced in India is calculated to be 1-2 kg /bed/day in a hospital and 600gm/day/bed in a private clinic. 85% of the hospital waste is non-dangerous, 15% is infectious or harmful. So it is essential to segregate and treat waste properly. Inappropriate handling of waste and disposal it increases the risk of infection [3].

The standard biomedical waste administration (BMWM) techniques are utilized for staying away from age of waste or recuperating of waste however much as could be expected, as opposed to arranging Reduce, reuse, and reuse is the idea of 3Rs on which great acts of biomedical waste management are done[4]. The techniques for treatment are utilized for the biomedical squanders incorporate concoction treatment, autoclaving, microwaving and the Shredding, profound internment and mutilation, burning, are likewise related strategies for the waste removal [5].

Biomedical wastes categories are divided according to color coding and type of waste. Mainly 4 bags are included i.e. Yellow, Red, White, and (Translucent) and Blue bag or container [6].Creating a promotion regarding the need of biomedical waste management is an important aspect of health care personnel. Haphazardly disposal of biomedical waste or hospital waste can lead to serious threats to the environment and human health. Improper management of waste which produced directs a bad impact on the health of health care workers and community [7].

II. Methodology:

The research approach used for present study was evaluative research approach. Research design used for present study was one group pre-test post-test research design. The study was conducted in Krishna Hospital. It has total 1100 beds and having separate departments like medicine, surgery, orthopedic, ENT, obstetrics & gynecology & department of dental etc. and also having separate biomedical waste management plant. There are different treatments facilities available at the site of BMWM plant, such as incinerator, shredding, autoclaving, chemical disinfectant etc.

Sample Size Calculation:

Sample size = 55

Sample and Sample Technique:

It includes 55 numbers of sweepers from various wards and biomedical waste handlers, who were working in the Krishna Hospital,. In this present study the researcher had been taken only sweepers those who were handling biomedical waste. In the present study sampling technique was used i.e. Non probability purposive sampling technique. It was suitable keeping in the view the time provided for data collection and the study

III. Data Collection:

The present study aimed at assessing effectiveness of video assisted teaching program & structured lesson plan on BMWM according to newer guidelines 2016 under the government of India, ministry of environment, forest and climate change.[6] In terms of knowledge and practices of biomedical waste handlers pre-test & post-test were conducted before and after administration of video assisted teaching program.

Development of the Tool:

A structured questionnaire was prepared for assessing the knowledge & structured observational checklist was prepared for assessing practices of biomedical waste management.

Section A: It includes socio-demographic data in that age, gender, educational qualification, working experience, monthly income of family, previous biomedical waste training.

Section B: Observational checklist to observe the practices. It includes 20 observational items. One mark was given for each correct practice and each wrong practices given zero. For preparing this observational checklist I have gone through various observational studies, Internet & biomedical waste management rules 2016 under the government of India, ministry of environment, forest and climate change.[6]

The practice score was arbitrarily graded as follows:

- Poor (00-7)
- Average (8-14)
- Good (15-20)

Section C: Structured Questionnaire to assess knowledge of biomedical waste handler. It includes 22 knowledge questions related to biomedical waste management according newer guidelines 2016. Each right answer was given a score one mark and wrong answer was given a score of zero. For preparing this structured knowledge

Questionnaire I have gone through various reviews of literature, Internet & biomedical waste management rules 2016 under the government of India, ministry of environment, forest and climate change.[6]

The knowledge score was arbitrarily graded as follows:

- Poor (00-8)
- Average (9-15)
- Good (16-22)

Video Assisted Teaching Program Regarding Biomedical Waste Management Content:

- Introduction of BMWM according newer guidelines
- Types of biomedical waste
- Types of categories
- Segregation of biomedical waste
- Transportation
- Treatment and disposal of waste
- Personal protective equipment (PPE)
- Mercury spillage
- Blood spillage
- Hand washing.

Structured Teaching Plan Content:

- Introduction of BMWM according newer guidelines
- Definition of BMWM
- Types of biomedical waste & its categories
- Steps used for handling BMW.
- Personal protective equipment (PPE)
- Common biomedical waste management treatment facility (CBMWTF)
- Barcoding system.
- Accident reporting.
- Treatment & disposal of biomedical waste

Inclusion Criteria:

- Biomedical waste handlers who were working in BMWM Department and sweepers from various wards KH, karad.
- Who were available during data collection.

Ethical Clearance:

The study was approved by the Institutional Ethics Committee of the KIMSDU, Karad Maharashtra before the commencement of study.

IV. Results:

Table 1: Distribution of Biomedical Waste Handlers according to sociodemographic variables.

Sr. No	Socio – Demographic Variables	Frequency (F)	Percentage (P)
	Age	27	49.09 %
	a) 19 – 30 year	12	21.81 %
	b) 31 – 40 year	16	29.09 %
	c) 41 – 56 year		
	Gender	38	69.09 %
	a) Male	17	30.90 %
	b) Female		
	Education	15	27.27 %
	a) HSC	30	54.54 %
	b) SSC	10	18.18 %
	c) PRIMARY		
	Experience	34	61.81 %
	a) 0 – 5 Years	9	16.36 %
	b) 6 – 10 Years	5	9.09 %
	c) 11 – 15 Years	7	12.71 %
	d) More than 15 Years		
	Monthly Income	7	12.71 %
	a) 32,000 – 47,000 Rs	12	21.81 %
	b) 18,000 – 31,000 Rs	12	21.81 %
	c) 6000 – 18,000 Rs	24	43.63 %
	d) Below 6000 Rs		
	Previous Training Regarding BMWM	50	90.90 %
	a) Taken	5	9.09 %

	b) Not taken		

Above table 1 indicates that of the majority of biomedical waste handlers i.e.27 (49.09%) belong to age group of 19 – 30 years &minimum handlers from age group31-40 years i.e. 12 (21.81%). In gender wise, 38 (69.09 %) handlers were males & 17 (30.90%) were female handlers. Majority of handlers are having their SSC educational status 30 (54.54 %) & minimum handlers having their primary education. The majority of handlers were having experience 0 – 5 years that is 34 (61.81 %) handlers & minimum handlers having more than 15 years of working experience. The 24 (43.63 %) handlers were having income below Rs.6000 thousand & only 7 (12.71%) handlers having their income between 32,000-47,000 thousand Rs. And majority of handlers have taken training regarding biomedical waste management 50 (90.90 %) & only 5 (9.09%) were not taken training regarding BMWM.

Table 2: Distribution of Biomedical Waste Handlers according to BMW Handling practice score.

Practices score	**Pre-training**		**Post-training**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Poor (00-7)	00	00	00	00
Average (8-14)	2	3.63%	00	00
Good (15-20)	53	96.36%	55	100%
Total	55	99.99%	55	100%

Table 2 shows that in pre observation none of biomedical waste handlers in poor category, 2 (3.63%) handlers had average practices & 53 (96.36%) handlers had good practices. After intervention it was improved in post observation majority of workers i.e. 55 (100%) had good practices and none workers had average and poor practices in after intervention.

Table 3: Distribution of Biomedical Waste Handlers according to BMW Handling Knowledge score.

Knowledge score	**Pre-test**		**Post-test**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Poor (00-8)	7	12.72 %	00	00 %
Average (9-15)	47	85.45 %	3	5.45%
Good (16-22)	1	1.81 %	52	94.54%

Total	55	99.98 %	55	99.99%

Table 3 reveals that in pre-test there were 7 (12.72%) handlers in poor category who all improved after educational intervention as seen in post-test none of participant in poor category. There was only one handler in good category before intervention which in increased to 52 (94.54%) in good category of knowledge after video assisted teaching program.

Table 4: Mean & SD of pre and post test scores of practices regarding biomedical waste management.

Area of analysis	**Mean ± SD**	**t value**	**P value**
Pre test	16.090 ± 0.7521	24.069	< 0.0001 Extremely Significant
Post test	19.36 ± 0.6487		
Difference	-3.273 ± 1.008		

Above table 4 indicates the significant increase in practice score on biomedical waste management as Pre Mean = 16.090 SD = 0.7521 to Post Mean = 19.36 SD = 0.6487.

Table 5: Mean & SD of pre and post test scores of knowledge regarding biomedical waste management.

Area of analysis	**Mean ± SD**	**t value**	**p value**
Pre test	10.963 ± 2.108	30.383	< 0.0001 Extremely Significant
Post test	18.727 ± 1.890		
Difference	-7.764 ± 1.895		

Above Table 5 indicates that after educational intervention, significantly increase in knowledge score of biomedical waste handlers as Pre Mean = 10.963 SD = 2.108 to Post Mean = 18.727 SD = 1.890..

Table 6: Association of knowledge and practice of biomedical waste handlers and socio-demographic variable by using unpaired‘t’ test.

Socio-demographic variable		**Frequency**	**Knowledge score**	**t value**	**p value**	**Practice score**	**t value**	**p value**
			Mean ±SD			**Mean ±SD**		
Gender	Male	38	11.39 ± 2.099	2.362	0.0219* Significant	16.15 ±0.7893	0.7070	0.4827 Not significant
	Female	17	10 ± 1.837			16 ± 0.7071		

Training	Taken	50	10.96 ± 2.176	0.04008	0.9682 Not significant	16.14 ± 0.7562	0.9506	0.3461 Not significant
	Not taken	5	11 ± 1.414			15.8 ± 0.8367		

The above table 6 depicts that gender of biomedical waste handlers were associated with pre-test knowledge as the p value was 0.0219, but the gender was not associated with pre-test practice as the p value was 0.4827. Similarly the training of the waste handlers was not associated with the pre-test knowledge and practice score as the p value for knowledge and practice was 0.9682 and 0.3461 respectively.

Table 7: Association of knowledge and practice of biomedical waste handlers and socio-demographic variable by using ANNOVE test

Socio-demographic variable,		**Frequency**	**Knowledge score**	**f value**	**p value**	**Practice score**	**f value**	**p value**
			Mean ±SD			**Mean ±SD**		
Age	19 – 30	27	10.592 ±1.782	8.814	0.0005*	16.148±0.6624	0.4935	0.6133 Not significant
	31 – 40	12	12.916±2.429			15.9166±0.9003		
	41 – 56	16	10.125±1.455			16.1875±0.8342		
Education	HSC	15	10.133±1.922	2.947	0.0613 not significant	15.93±0.7037	0.6044	0.5502 not significant
	SSC	30	11.566±2.192			16.2±0.7144		
	Primary	10	10.4±1.647			16.1±9944		
Experience	0 – 5 Years	34	10.55±1.971	1.429	0.2452 not significant	16.088±0.8658	0.2875	0.8342 Not significant
	6 –10Years	9	12.11±2.028			16.11±0.60		
	11 -15 Years	5	11.4±3.362			16.4±0.5477		
	More than 15 Years	7	11.14±1.574			16±0.57		

Income	32,000 – 47,000 Rs	7	10.85±1.34	0.2264	0.8776 Not significant	16±0.81	2.348	0.0835 Not significant
	18,000 – 31,000 Rs	12	10.83±3.04			16.41±0.51		
	6000 – 18,000 Rs	12	11.41±2.539			15.66±0.77		
	Below 6000 Rs	24	10.83±1.52			16.20±0.77		

The above table 7 depicts that demographic variable like Education, Experience and Income was not significantly associate with pre-test knowledge and practice as the p value was < 0.0001. But the age is significantly associated with knowledge as the p value was 0.0005.

V. Discussion:

The study revealed that that before administration of video assisted teaching program, the 47(85.45%) participant were having average knowledge, and 7 (12.72%) participants were having poor knowledge and only 1(1.81%) participant having good knowledge regarding BMWM, But after giving structured teaching plan and administering video assisted teaching program, majority of the handlers 52 (94.54%) were having good knowledge and the only 3(5.45%) were having average knowledge, and none of participants were having poor knowledge regarding biomedical waste management newer guidelines (2016). Study was supported by similar study on effectiveness of educational intervention on knowledge and practice among bio-medical waste handlers reveals that before giving educational intervention out of 187 samples, 110(58.8%) were having poor knowledge and after giving educational intervention there were 148(79.1%) handlers having excellent knowledge, the showing that no one person's having poor knowledge regarding BMWM [8].

The present study reveals that the practices of biomedical waste handlers out of 55 handlers the 53 (96.36%) participants were having good practices and the only 2(3.63%) participants were having average practices and none of participants i.e. 0(0%) were having poor practices., where as in post practices also increased score of practice that is 55(100%) means all handlers doing good practices and none of participants were having average and poor practices regarding biomedical waste management newer guidelines (2016). Study was supported by similar study conducted by Tukaram Zagade & et.al in (2012) on effectiveness of educational intervention on knowledge and practice among bio-medical waste handlers reveals that before giving educational intervention out of 187 samples, as in pre- practice score there were 157(83.9%) having poor practice, and as seen in post training after educational intervention 83(44.3%) were having excellent practices and 100(53.4%) were having good practices[8].

Arranged instructing program on information on moms in regards to factors influencing healthful status of preschool youngsters was effective to improve the information on mothers[9]. The investigation reasoned that there is solid need to instruct the patients with progressively serious program in regards to early ambulation post cardiovascular catheterization.[10] The examination presumes that there is deficient information on medical aid the board of customer with hound nibble and treatment methodology of pooch chomp among grown-ups. There is more requirement for wellbeing training in regards to a canine nibble medical aid the executives, appropriate immunization and care of wounds among adults.[11] The examination presumed that organized encouraging project was profoundly powerful to improve information on guardians in regards to oral care.[12] Study inferred that Informational booklet was extremely viable so as to pick up information on chose crisis drugs among staff attendants working at chose hospitals.[13] There was a huge distinction between pre-test and post-test scores on information in regards to Post Dialysis Home Care among Caretakers.[14] study reasoned that the directing was a successful to improve the personal satisfaction among patients with coronary heart disease.[15] finding of the investigation suggest that there is a necessity to build information towards counteraction of hypothermia by taking instructive program among primi antenatal moms will be useful in dealing with neonates after delivery.[16]The discoveries it is very confirm that the patients who got intuitive video data demonstrated noteworthy decrease in the degree of preoperative anxiety[17].Videos helped instructing assists with recalling the means of centered clinical evaluation yet may not mull over the sentiment of touch expected to perceive the parts. There is not a viable alternative for clinical exhibition; in any case, video-helped instructing can be utilized as an enhancement to the generally utilized bedside showing. The blend of instructional techniques can be utilized to get a rich gracefully of learning opportunity.[18]

The present study depicts that statistically significance increase in knowledge mean scores as increased from (mean pre 10.963±2.108 to mean post 18.727±1.890) The paired' test applied for assessing effectiveness and it showed the calculated paired t value t=30.383. The 'p' value < 0.0001 level, Indicates that significant improved in knowledge regarding biomedical waste management according to newer guidelines (2016), thus the video assisted teaching program was effective. Similar study conducted by Mini Lalmuanpuii& et.al in (2013) reveals that the knowledge score after administering the video assisted teaching program had increased than before i.e. pre-test knowledge mean was 17.383 and posttest mean was 26.033 with 't' value 12.497 giving 'p' value <0.0001 which is considered extremely significant, indicates significant improvement in knowledge regarding BMW. Therefore, the VAT program was found to be effective [19].

Similar study was conducted in selected PHCs in Bangalore on knowledge aspect of BMW management in which video assisted teaching was also administered. The pre-test mean was 36.70 which was increased to posttest mean 86.70 with 't' value 14.04 giving 'p' value <0.0001 at a significant 5% level, which was considered as extremely significant. Thus this indicates that video assisted teaching was effective [20].

In present study reveals that significance increase in practice mean score as increased from (pre 16.090 SD± 0.7521 to post 19.36 ± 0.6487). The paired' test applied for assessing effectiveness and it showed the calculated paired t value (t=24.069) The 'p' value < 0.0001 level, Indicates that significant improved in practice regarding biomedical waste management according to newer guidelines (2016), thus the video assisted teaching program was effective. Similar study reveals that before educational intervention the pre mean practice score was 7.8 with a S.D 3.8, which improved after intervention to 21.6 with a S.D. of 3.8 (t= 39.1, p<0.001)[8]. In this present study unpaired 't' test and ANNOVA test was used for determine the association between pre-test

knowledge and practice of biomedical waste handlers and sociodemographic variables like age, gender, education, experience, income, previous preparing in regards to BMWM. Comparable investigation was utilized one route ANOVA for deciding the relationship between pre-test information and chose socio-segment factors like age, instruction and long periods of experience. Unpaired 't' test is used for finding the association between pre-test knowledge and previous training experience[19].

There was significant association between gender of biomedical waste handlers & pre-test knowledge regarding BMWM according to (2016) guidelines (p =0.0219, unpaired 't' value 2.362) where as there is a no significant association with practice.

There was significant association between age of biomedical waste handlers & pre-test knowledge regarding BMWM according to (2016) guidelines (p = 0.0005, F=8.814) where as there is a no significant association with practice. Similar study revealed that there is significant association between age of the staff nurses and pre-test knowledge regarding BMW management policies (P=0.0202, F=3.533), segregation (P<0.0001, F=8.862) and storage (P=0.0015, F=5.862) of BMW [19].

There was a no significant association between education, income, experience and training and pre-test knowledge and practice regarding BMWM according to (2016) guidelines.

The present study found that extremely change or improvement in knowledge and practices of biomedical waste handlers regarding biomedical waste management. This video assisted teaching program was effective for every worker who dealing with biomedical waste in the hospitals.

VI. Conclusion:

Based on the analysis of findings of the study the following interference was drawn. There was an increased knowledge and practice score among biomedical waste handlers after administration of video assisted teaching program. This research helps to not only for biomedical waste handlers but also help to all employees who are working in the hospital, clinics and nursing home with the help of this video assisted teaching & structured teaching program we can improve the knowledge at anywhere anytime.

In present study it was reported that employees are very interested to watch as well as listen the video more than reading and writing. After watching this video the workers can adapt easily never guidelines regarding biomedical waste management in their daily work setup and they become more confident in their work.

Also this video assisted teaching program can be used for improving knowledge of all staff nurses those who are working in the hospitals.

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