Analysis of Hospital Staff Exposure Risks and Awareness about Poor Medical Waste Management - A Case study of the Tabuk Regional Healthcare System - Saudi Arabia

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Abstract

Aims: **The objective of the current study is to seek ways to improve the present situation on occupational risks and awareness about poor medical waste management. It introduces analysis which measures the awareness of hospital staff and knowledge of medical waste processing awareness of existing management methods, health and environmental impacts, realizing policies and concerns of the public about the existing medical waste management processes.**

Methods: **This study utilizes both face- to- face interview and self-administered questionnaires regarding staff age, years in service, infectious exposure accidents, and knowledge of the concept of medical waste and associated health and environmental impacts of poor medical waste management. Sixty two Healthcare Facilities (HCFs), including 15 large size HCFs (hospitals), and 47 medium to small size HCFs (medical laboratories and healthcare medical centers), are investigated. Herein, statistical multivariate procedures namely factor analysis and multiple regressions procedures are conducted using SPSS v.18.0 computer software.**

Results: **Results indicate that the strongest exposure risk factor to sharp and needle stick injuries exists for Health care personnel (HCP) who are over 45 years old. Another significantly related factor is spending 3 years or less in service. Also, results on awareness and basic knowledge indicate that about 21% of hospital staff interviewed had a fair knowledge of the concept of medical waste, and about 58% are aware of the associated health and environmental impacts. A further 26.7% and 15.1% are either unaware or uncertain of the associated health risks and exposure risks of poor medical waste management. However, 42.7% of the respondents are unaware of any policy of any type related to the issue of medical waste while 62.1% had never attended any training course or workshops during their service. The results further reveal that 32% of the personnel interviewed had never received any biomedical waste management training from their healthcare managers concerning infectious accidents resulted from sharp and needle stick injuries (SHNSI).**

Conclusion: **There is a great need to develop and adopt a comprehensive healthcare management strategy which includes three keys to success, namely: multi- sectorial cooperation, policy and legal framework, rigorous program for personnel training and raising awareness. Training programs for bodies of HCFs would help in simplifying all delivered guidelines on medical waste management. Such measures would lead to better treatment and controlling the process of monitoring made by administration officers. Recently, Saudi Arabia has implemented many exhaustive training and awareness- raising programs on the safe and proper management of medical wastes.**

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Introduction

There is a strong confirmation from Canada, Japan, and USA that the main concern of infectious hospital waste is the transmission of AIDS/ HIV virus and, more often, of Hepatitis B or C virus through injuries caused by syringes contaminated by human blood. The groups at risk are mainly medical care workers, especially nurses, followed by the other hospital workers like housekeepers or those in the food-preparation vicinity. The death of six nurses, following the outbreak of Hepatitis in Renal Failure Units at hospitals in the United Kingdom during the year 1969/ 1971, dramatically illustrates the health and safety hazards associated with handling of infectious materials.[1-3] In the USA, the Agency of Toxic Substances and Disease Registry states that the overall injury rate of all workers who may came in contact with medical waste within the HCFs was 180 per 1,000 workers per year.[4]

The recent increase in the number of patients infected with AIDS and Hepatitis B or C, together with the concern of the general public for the real or imagined dangers of cross infection from such patients have highlighted the need for an increased awareness and seriousness on the proper handling and disposal of medical waste.

In carrying out their daily functions, Healthcare workers and staff from developing countries put their health and the health of their family members at risk. This might be resulted from percutaneous injuries (PI) with contaminated sharps or splashes of contaminated blood and other body fluids on abrasive parts of the skin or on mucous membranes. A study by Patwary et al.[5] on exposure risk analysis among healthcare workers in Bangladesh revealed that 73% of workers did not wear personal protective equipment (PPE) frequently. Also, more than 18% have inadequate PPE. Accordingly, 95% of HCFs staff testified that they had gone through occupational accidents. More than 75% of these accidents were attributed to the mishandling of needles and sharp tools during patient's treatment processes. Other researchers reported the same remarks in many developing countries.

Commonly, these observations were related to the deficiency of essential requirements for the protection of healthcare workers and staff. Housekeeping workers did not wear or use protective equipments. Also, there was a lack in the knowledge and awareness among healthcare workers to the exposure risks of medical wastes or how to deal with such wastes in case of occupational accidents. Moreover, there were no well- defined protocols or guidelines at HCFs for any management system of their wastes or proposed techniques for minimization and recycling.[2,6,7]

Martins et al. showed that 65% of healthcare workers reported needle stick and sharp tools accidents in the last 5 years.[8] More than 74.8% of the injured workers were nurses. Majority of the occupational accidents were reported at syringe needle unit. Furthermore, a WHO report estimated that contaminated injections and syringes accidents were responsible for more than 32% of all new infections with hepatitis B, 40% of all new infections with hepatitis C, and approximately 260000 new HIV infections.[1]

Ajibola et al. assessed the needle stick injuries from 474 HCFs staff in Nigeria;[9] it revealed a rate of 0.6% per person- year overall, distributed as follows; dentists- 2.3%, surgeons- 2.3%, nonsurgical physicians- 0.4% and nurses- 0.6%. Exposure assessment revealed 29% from unexpected patient movement, 23% from mishandling of used needles, 18% from needle recapitulating, and 18% from unintended punch by an assistant, and finally 10% from needle disassembly. Therefore, healthcare workers are at the highest level of exposure risks of acquired infectious diseases (blood borne) due to sharp sticks which leads to direct contact with patient's blood or body fluids.

Currently, the Kingdom of Saudi Arabia is commissioning rigorous actions to combat problems associated with infectious equipment and medical waste. Few studies have been conducted to assess medical waste issues in the Kingdom. Al-Zahrani et al. have conducted a study on exposure risks in HCFs in Saudi Arabia and generation rate of medical wastes.[10] It was concluded that HCFs produce healthcare waste risk, and much care is given by the responsible authorities for the management of this type of waste. A program is being established to formulate standards for healthcare waste management. David et al. have assessed medical waste management systems in selected HCFs in Saudi Arabia.[11] The study concluded that many items were discarded improperly with substantial increase in cost or negative implications on the health of workers and public. Some of these HCFs do have a waste

management system in place which is relatively ineffective. There are obvious gaps during segregation, collection, transportation and disposal processes. As a result, hospital staff exhibit different levels and types of exposure, contamination, and infection.[11]

Most of the previous studies on Saudi hospitals have focused on quantification of medical wastes generated at HCFs. Few have addressed the impacts of such wastes on HCPs and public environment. Therefore, there are no reliable data on occupational safety or staff awareness in the Kingdom of Saudi Arabia. The objective of this study is to bridge the gaps and to seek ways to improve on the present situation. This article presents findings on the relationship between HCP age and years in service with exposure risk of SHNSI. Also, it introduces further analysis which measures the awareness of hospital staff of the knowledge of medical waste. Also, it measures management methods and environmental impacts. Furthermore, it shows the enforced policies and public concern about the existing medical waste management processes.

Study Area

Tabuk province is located in the north western part of the Kingdom of Saudi Arabia (fig. 1). The city has gone through a heavy development and rapid increase in population since 1995. A sum of 62 healthcare Facilities (HCFs), including 15 large size HCFs, and 47 medium to small size HCFs (medical laboratories and healthcare medical centers), were investigated during the course of this study. The total population of the province which was served by healthcare system is about 1.2 million. The Directorate of Health in Tabuk is an official firm that is responsible for control and management of public health related issues within the Province which is a followed part of the Ministry of Health.

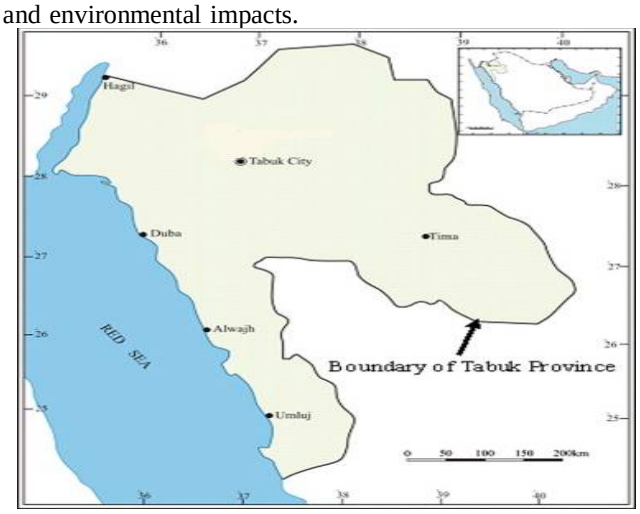

Figure 1.Location map of Tabuk Province

Materials and Methods

Data was collected by means of interviews and questionnaires. The questionnaires were developed based on literature review.[1,4,12,13] They contain seven sections and nineteen main questions. Sections are: (1) HCF settings, (2) information on the HCPs (occupation, age, gender, years in service), (3) waste management policies and legislation, (4) waste management practices, (5)HCPs education and training, (6) attitude assessment towards infection control, and (7) exposure accidents (mainly injury accidents due to sharps and needle stick).

Answers format were in limited choice alternatives, with some checklist accompanied by several possible answers from which the respondent choose the correct one that are related to basic knowledge, fair knowledge, and no idea, yes, no, aware, unaware, and uncertain. Some questions have free answers allowing the respondents for further exploration on some issues. The designed questionnaire template is provided in Appendix 1.

Questionnaires were provided to 930 HCPs who have direct contact with human blood, such as doctors, nurse, Lab technicians, students, cleaners' staff and housekeepers. The questionnaires were completed by 792 of 930 HCPs surveyed, which gives a response rate of 86.1%. However, 12 forms were incomplete. Therefore, only 780 questionnaires were used for the final analysis.

Data collection went on from December 2011 to March 2013. Hospital administration staff was not included in the study because their activities do not directly have exposure risks. All respondents used the same questionnaire, irrespective of job position, experience, or level of education, though they were required to indicate such variations. Table 1 shows the statistics of questionnaire respondents and SHNSI records.

Parameter (Abbreviation)	**N**	**% (col.1/780)**	**Sharp and needle stick injuries**	**% SHNSI (col. 3/237)**
	Col. 1	Col. 2	Col. 3	Col. 4
Job group **(OCU)**				
Doctor	89	11.41	3	1.27
Nurse	461	59.10	179	75.53
Lab technicians	43	5.512	8	3.38
Student	32	4.10	2	0.84
Housekeeper/ cleaner staff	155	19.87	45	18.99
Total	**780**		**237**	
Age group **(AGE1-4)**				
AGE1 20-30	137	17.56	59	24.89
AGE2 30-40	162	20.76	33	13.92
AGE3 40-45	170	21.79	49	20.68
AGE4 45 and above	311	39.87	96	40.51
Total	**780**		**237**	
Years in Service **(YRS1-4)**				
YRS1 Less than 3	112	14.35	103	37.73
YRS2 3-10	246	31.53	31	11.36
YRS3 10-15	185	23.71	38	13.92
YRS4 Greater than 15	237	30.38	65	23.81
Total	**780**		**237**	

Table 1.Statistical summary of questionnaire respondents and infectious accidents records for the past 5

Data Analysis

Health care facilities included in this study were Medical University hospitals, Dental hospitals and clinics, General hospitals, Private hospitals, Primary healthcare centers, local healthcare centers, Laboratories, and Veterinary hospital. All interviewed personnel were asked to point out their views on waste management policy, practices and their attitudes towards this issue. All respondents were also given the opportunity to show details regarding certain questions asked. The mean age of the sample was 39. There were 318 males and 462 females. The demographic distribution of the surveyed sample is shown in table 2.

Parameter	**Doctors**	**Paramedical**	**House Surgeons**	**Students**	**Auxiliary Staff**
Number of respondents	146	173	163	141	157
Primary	0	0	0	0	96
Secondary	0	0	0	141	61
Graduation	98	112	163	0	0
Post Graduate	48	61	0	0	0
Gender					
Male	128	22	52	72	44
Female	18	151	111	69	113
Age					
< 25	32	141	163	35	16
25-34	50	0	0	101	91
35-44	59	0	0	32	32
>45	16	0	0	4	8

Table 2.Demographic distribution of all respondents

Data analysis of waste management practices showed that only four respondents were able to define the color codes correctly. On the contrary, symbols for Bio- hazard materials identification were reported to be used for labeling by only 18% of them. Also, 11.4% of the respondents witnessed a waste audit practice in the last two years.

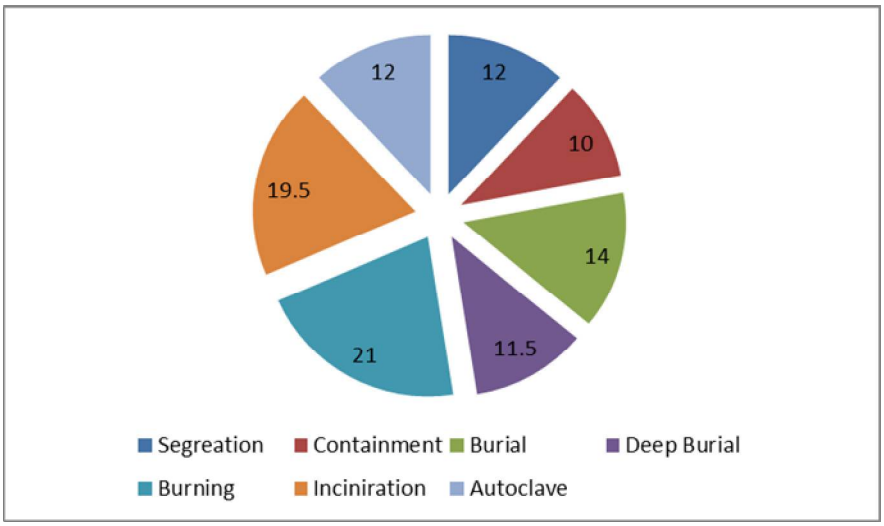

Figure 2.Medical waste management practices

Figure 2 showed that burning was the most widely followed practice (21%) followed by incineration (19.5%). Least favorable practices reported were burial (14%), segregation (12%), autoclaving (12%), deep burial (11.5%) and containment (10%).

Majority of respondents (78%) reported that waste should be segregated but were not clear who should do the segregation. However, 59% reported that segregation should be the responsibility of auxiliary staff. A small percentage (5.29%) was of the view that doctors have a role in segregation. 74% of them reported that they did not color code the wastes.

All collected data have been assembled and analyzed using SPSS v.18.0 computer software. Statistical multivariate procedures, namely factor analysis technique and multiple regression analysis, were conducted in order to: (1) identify risk factors that highly affect number of occupational accidents due to sharp tools and needle sticks (SHNSI), and (2) investigate awareness of HCPs to impact of poor medical waste management on public healthcare and on the environment.

Analysis of Risk Factors affecting Sharp and Needle Ntick Injuries (SHNSI)

The exclusivity of the multivariate techniques employed herein is found in the combination between clustering methods and multivariate techniques. Factor analysis is the best tool to reduce both the dimensionality of the dilemma and computational time needed for data processing and analysis. Moreover, it replaces the huge number of variables with a smaller number of parameters, which are relatively independent from each other. Clustering method was used when parameters are highly correlated and then they combined into a single factor. However, principal components with varimax rotation technique were employed herein for factor extraction.

The first step in the factor analysis is to define the group of variables that may be associated with the number of accidents due to injuries of sharp tools and needle sticks. In this study, eight parameters were considered, namely: HCP occupation (OCU), HCP age (AGE1-4), HCP gender (GEN), HCP years in service (YRS1-4), waste management practices (WMPr), waste management policies (WMP), HCPs education and training (EDT), and infection control measures (INC). Most of these variables are quantified as dummy variables (i.e., 0 and 1). Figure 3 shows a conceptual model that defined the eight parameters, which are highly correlated to the occupational accidents.

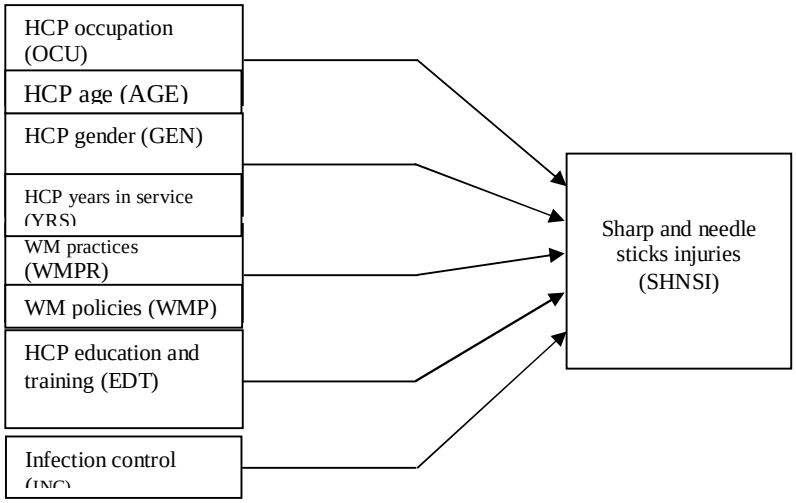

Figure 3.Conceptual model of the eight parameters affecting sharp and needle stick injury accidents (SHNSI)

Factor analysis procedures were performed once the identification of the 8 original variables step is accomplished. It involved the combination of both factor analysis and the principal components method with varimax rotation.[13] Such coupled technique helped in spreading out all the squares of the loading on each factor and transforming them into a simple and clear factor structure. However, for the purpose of identifying the risk factor related to infectious accidents (SHNSI), multivariate regression procedures were employed to evaluate the statistical significant factor at $p<0.01$. This threshold has been set as a significant level for parameters to be included or removed.

Multivariate regression diagnostics were employed based on the following assumptions: (1) Even distribution for all residuals; (2) Constant variance for all residuals; and (3) Auto correlation should not be used, only independent residuals should be included in the analysis. Also, the following necessary constrains should be applied: (1) All data sets with unusual high or low residual values should be ignored (i.e., free of outliers); and (2) multicolinearity and very complex correlation structures among variables should be avoided.

Basic Knowledge Variables Statistical Analysis

The data collected on awareness and basic knowledge variables such as concept of medical waste, awareness of environmental impacts of inappropriate management methods, medical wastes policy, availability of personnel training programs, and actions in case of infectious accidents were further analyzed. Multivariate regressions were employed to determine HCPs' awareness of: (1) the existence of national and international policies or legislation on efficient medical waste management, (2) poor medical waste management effects on public health and on the environment and (3) importance of well-defined procedures for pollution control.

Results and Discussion

Risk Factors Regression Model

A prediction model for SHNSI using multi-regression analysis was developed using OCU, AGE1-4, GEN, YRS1-4, WMPr, WMP, EDT, and INC variables, as predictors; a multiple regression model to relate SHNSI values with the above factors was developed.

SHNSI linear regression model was developed by utilizing the following; the coefficient of determination R^2, Mean Squared Error MSE, Mallow's coefficient C_p, Sum Squares prediction, and significance tests for all individual regression coefficients impeded within each model.[14]

SHNSI = 121.521 - 4.126 (WMPr) - 10.209 (EDT) + 32.825 (AGE4) + 17.364 (YRS1)

Table 3 shows the coefficient values for this developed model, along with their matching p-values showing their significance. The confidence

level for the prediction model of SHNSI variability (i.e., R^2) is about 73.29%, which indicates reasonably good prediction. Also, the strongest predictors of SHNSI are those coefficients in the table with the lowest p-value.

Parameter	Estimate	Stand. Error	t Statistic	*P-Value*
CONSTANT	121.521	8.254	18.141	0.000
EDT	-10.209	6.295	-3.528	0.001
WMPr	-4.126	3.719	-2.506	0.016
AGE4	32.825	9.226	4.100	0.000
YRS1	4.851	13.871	2.747	0.009

Table 3.Regression coefficients

The linear regression model illustrates that the total number of sharp tools and needle stick injury (SHNSI) accidents increases with an increase of HCPs who have an age of 45 or more (AGE4), and with HCPs who have 3 years or less in service (YRS1). Abu-Gad showed that 50% of injuries accidents occurred with healthcare workers who have an experience of 3 years at service or less.[15] Fresh graduates in practice may put more attained knowledge, while skilled professionals pay less attention and take fewer precautions at work due to familiarities. This attitude definitely leads to increased human error and results in occurring of more accidents.

Moreover, this model shows that SHNSI decreases when education and training (EDT), and WMPr are well established and existed in HCFs. Specifically, the developed linear equation shows that HCPs' age subgroup 4 (AGE4), and years in service subgroup 1 (YRS1) are the strongest predictors of SHNSI, bearing in mind the high values of the coefficients in front of these parameters.

The above model shows that there is a correlation between SHNSI and medical waste management system. Waste management practices, policies, and training conditions affect the number of SHNSI. A similar conclusion regarding age category of 39 years or more has been recently reached by Martins et al.[8] However, the current study showed that HCPs with 3 years in service have the highest exposure risk to SHNSI, not those with 10 years of experience or more as found by Martins et al.[8] Also, this study showed that variables HCPs ages AGE1-3, HCPs YRS2-4, HCPs OCU, WMP, and INC, are not strong predictors of SHNSI; therefore, they were ignored in the regression model. This can be justified based on the multicollinearity that existed between these factors; for example, WMPr and WMP are highly correlated (linear interdependence) to each other, therefore only one variable was included in the regression model.[16-18]

Awareness variables	Groups	Results (%)
Concept of MW	Basic	62
	Fair	20.7
	No idea	17.3
Health and environmental impacts of poor MWM	Aware	58.2
	Unaware	26.7
	Uncertain	15.1
National and International Policies of MWM	Aware	46.3
	Unaware	42.7
	Uncertain	11
Availability of training and awareness programs for HCPs	Yes	37.8
	No	62.2
Any infectious procedures in case of SHNSI accidents	Yes	68.1
	No	31.9

Table 4.Results of awareness and basic knowledge variables (95% Confidence Interval)

Analysis of HCPs Awareness and Basic Knowledge Variables

The results of different awareness and basic knowledge variables; concept of medical waste practices, environmental impacts of inappropriate management methods, national and international medical wastes policies, availability of periodic training and awareness programs for HCPs, and

any procedures in case of infectious accidents, are presented in table 4.

Statistical results reveal that 62% HCPs working with patients, including cleaners and housekeepers have a basic knowledge of the concept of medical waste. About 21% of the respondents had an appropriate knowledge of the concept of medical waste, whereas 17.3% of the respondents had no idea of the concept of medical waste.

This study further reveals that 58.2% of the respondents were aware of the health and environmental impacts of medical waste management systems. However, 26.7% and 15.1% were, respectively, either unaware or uncertain.

About 43% of the respondents were unaware of policies practiced in HCFs at both the national and international levels; the remaining 46.3% and 11% were aware and uncertain, respectively.

Results also showed that only 62.2% of HCPs had not received any form of training, and that they did not undergo awareness programs during their service in hospitals, while 37.8% of the respondents did.

Interviews showed clearly that the healthcare workers are lacking awareness of the consequences of poor medical waste management, especially both generators and waste handlers.

As it was realized during the course of this study, these numbers might be attributed to the fact that a significant percentage of cleaners, housekeepers, and hospital staff were foreigners and economical laborers with low qualifications or no experiences at all. Therefore, rehabilitation and education of these laborers should be an essential part of any healthcare management strategy developed in the region.

Collected data on legal issues showed that the majority of the respondents were not aware of any legal issues involved. Most of them had no specific knowledge about the issues involved and ways to tackle medical waste management and practices. Survey revealed that safe management of medical waste should be recognized as being more of attitude problem rather than providing technology and facilities. Another notable attitude factor was the emphasis on the need of a team work policy to reach an effective waste management strategy. Also, vast majority of respondents reported that academic institutions and non- governmental organizations could play a vital role in providing education, raising awareness, and disseminating of information.

Conclusions

This study has assessed the impacts of selected parameters related to HCPs and MWMs on SHNSI accidents by combining both factor analysis techniques with linear regression analysis. Such analysis helps health care managers by providing quantitative measures with their planning and policy development efforts. The exclusiveness of these procedures was employed to identify the clusters of variables that highly correlated with SHNSI accidents.

Extraction procedures showed that eight variables were condensed into four factors that are relatively independent from each other. Then, the multivariate regression technique was employed to relate SHNSI with the strongest- predictor factors. It was shown that:

- SHNSI was controlled, at most, by HCPS age of 45 or more (AGE4), and HCPs with 3 years or less in service (YRS1). According to the findings of this study, fresh graduates of three years of experience or less were at high risk probably due to insufficient training and exposure experience on MWM. Further training and awareness programs may enhance and enrich their experience substantially.

- The regression model showed a correlation between availability of medical waste practices, education, and training programs offered at HCEs and their employees with the sharp tools and needle stick injuries. Adopting well- defined WM procedures and plans reduces number of accidents resulted from SHNSI since such plans set definitive guidelines on WM practices to be firmly followed by all staff.

- Enhancing awareness culture in HCEs through training workshops, brochures, and seminars would reduce the number of SHNSI accidents and improve staff awareness of various aspects of medical wastes. Results revealed that 75.5% of the SHNSI accidents happened with nurses. Thus, special programs must be designed to bridge this gap and improve their skills and knowledge.

- HCPs with age 45 or more were at high risk of exposure to SHNSI accidents. This study indicates that staff with older ages (>45 years) are ready to move to new managerial job or to early retirement.

- The factor analysis technique when coupled with regression analysis would reduce both dimensionality of the problem and processing time of data.

- In order to minimize the number of injuries due to sharp and needle sticks, it is important to secure handling of such items at every step of the process (starting from recapping to final disposal of these items).

- Results showed a great need for further education and training on the nature of occupational accidents risk posed by medical waste and ways for their proper handling and management for HCPs and the general public. Also, a great effort is needed to set well-documented and clear instructions for all HCPs and external visitors who are at exposure risk to medical waste.

Results showed that there is a great necessity for (1) a multi- sectorial cooperation between all involved parties and interaction at all levels, (2) a policy and a legal framework, and (3) training of personnel. Raising public awareness is the essential tool for any successful and efficient medical management strategy. The creation of training institutes for nurses and other auxiliary hospital staff in Tabuk region might be an attractive solution for the arising problems identified in this study.

The findings of this article help healthcare policy makers and also give further information to facilitate policy development and to improve their management strategies. Furthermore, it assists the hospital management to direct their resources to critical and weak areas. Also, these analyses help healthcare managers to know precisely where to put more emphasis like targeted staff for training, critical ages of HCPs, knowledge deficiencies, and development of remediation measures in cases of infectious accidents. Ultimately, it also leads to preparation of effective and comprehensive medical waste management plans.

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Appendix 1.Questionnaire Template

1. Health care setting:

- 1. Medical College Hospital. ☐
- 2. Private Hospital / Nursing Home. ☐
- 3. Community Health Centre. ☐
- 4. Primary Health Centre. ☐
- 5. Laboratories / Blood Bank. ☐
- 6. Dental Clinic. ☐
- 7. Dispensary. ☐
- 8. Veterinary College Hospital. ☐
- 9. Others. ☐

2. a) Person interviewed:

- A. Doctor. ☐
- B. Paramedical. ☐
- C. House Surgeon. ☐
- D.Student. ☐
- E. Auxillary Staff. ☐

b) Education:

- A. Post Graduation. ☐
- B. Graduation. ☐
- C. Secondary. ☐
- D. Primary. ☐
- E. Illiterate. ☐

3. a) Age. ☐ b) Sex. ☐

4. What is the quantity of waste generated every day in your health care setting ?

.....

Waste Management Policy :

Yes ☐ No ☐

If yes, who does the segregation

1. Doctor ☐
2. Nursing Assistant ☐
3. Auxillary staff ☐
4. Do not Know ☐

7. Do you color code the waste for disposal?

Yes ☐ No ☐

If yes, match the following

Yellow	Puncture proof plastic Bag / Container	Incinerator/ Deep Burial
Red	Plastic Bag	Disposal Landfill
Blue / White	Plastic Bag	Autoclave / Microwave
Black	Disinfected container Plastic Bag	Autoclave / Microwave

8. Is the infection waste labelled with the Bio-Hazard Symbol?

Yes ☐ No ☐

9. Where do you dispose Biomedical Waste?

1. Dumping in corporation bin ☐
2. House to House Waste collection ☐
3. Any authorised hospital waste collection ☐

10. Do you maintain a register for waste disposal?

Yes ☐ No ☐

11. Has you healthcare setting done a waste audit in last three years?

Yes ☐ No ☐

Employee education :

12. Have you undergone any training programme on hospital waste management ?

Yes ☐ No ☐

13. Does you hospital provide annual education on waste management for employee ?

Yes ☐ No ☐

14. Would you like to attend a programme on Hospital Waste Management ?

Yes ☐ No ☐

Attitude Assessment

	Agree	Disagree	No comment
15. a) Safe management of health care waste is not an issue at all.	☐	☐	☐
b) Safe management of health care waste is the responsibility of government.	☐	☐	☐
c) Waste management is team work / no single class of people is responsible for safe management.	☐	☐	☐
d) Safe management efforts by hospital increases financial burden on management.	☐	☐	☐
e) Safe management of Health Care waste is an extra burden on work.	☐	☐	☐