



HEALTHCARE PROVIDERS' READINESS FOR MANAGEMENT OF INCIDENTS WITH WEAPONS OF MASS DESTRUCTION

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ABSTRACT:

The world has witnessed an increasing number of incidents where weapons of mass destruction (WMD) were used. Disparity between the available and required medical means and capabilities poses a serious challenge for the hospitals in vicinity of the area of damage. Their ability to withstand the disaster and provide efficient response depends on several indicators, including healthcare providers' knowledge and skills to perform their duties in contaminated environment.

The purpose of this study is to analyse hospital staff readiness in case of incidents with WMD.

Materials and methods: 5-question dichotomous survey was performed among 52 healthcare providers working in hospitals in Plovdiv region. Results are analysed and presented by descriptive, comparative and graphic methods.

Results: Performed analyses reveals the low level of awareness among healthcare providers, regarding the planning, organization and execution of medical support in case of incident with weapons of mass destruction. Main concern is related to the high number of medical professionals that are not familiar with the hospital plan for reaction in CBRN (Chemical, Biological, Radiological and Nuclear) contamination. Almost the same number of respondents has no information regarding hospital resources. 69,23% of the respondents are not informed about their tasks, and the same percentage are not sure what medical information is required.

Conclusions: The results highlight the need for information exchange on issues related to the medical support plan, activities and resources management among hospital staff. Practical drills are also recommended.

Keyword: disasters, disaster medical support, hospitals, weapons of mass destruction,

INTRODUCTION:

The world has witnessed an increasing number of incidents where weapons of mass destruction (WMD) were used. Their impact on population and environment has consequences that pose serious challenge for proper management with the available resources. [1] This involves all institutions engaged in disaster relief to population, includ-

ing the healthcare system. There are a lot of instances that prove this discrepancy between required and available means and capabilities. Regardless of the type of the weapons used, casualties always require rapid and focused medical interventions. They include both pre-hospital and hospital activities. Out of hospital activities include triage, control of decontamination, stabilization in the forward medical station and evacuation. [2] This evacuation is directed to the hospitals in vicinity that are chosen based on their capability to provide definitive care to the affected. Medical support in the hospitals always demands change in normal practice and procedures to algorithms, specific for each event. Hospitals' ability to withstand the impact of the WMD and provide efficient response is measured by several indicators including hospital contingency plan initiation and execution, emergency response capabilities, resources and etc. [3,4] Healthcare providers' knowledge and skills to perform their duties in CBRN contaminated environment are the "backbone" of the WMD medical support. Apart from the casualties, hospitals have to deal with an increased number of patients with exacerbated chronic diseases. Some of the reasons for deterioration of their illnesses are stress, the lack of care because all available resources are engaged in disaster mitigation, poor environment conditions, etc. This multiplies the workload that all hospitals around the area of damage have to manage with the available personnel. That requires to maximise the effectiveness of the hospital staff activities. [5] This could be assured by building and improving medical staff awareness, knowledge about the hospital disaster medical support plan and the duties of each staff member. Medical activities, managing bodies, coordination and subordination structure, resource and protective equipment supply are described in detail in the hospital disaster medical support plan. Effortless and uneventful execution of this plan requires familiarizing all staff members with it and practising and training all activities, especially those that are not a common practice but are of vital importance in some disastrous events (decontamination, antidote therapy, etc.). Emphasis should be put on communication among staff members since it has proven to be one of the major problems. [6,7]

Another challenge that could be faced is the proper protection when WMD are used. The majority of medical

professionals do not pay proper attention to PPE. As important as it is for the medical professionals' to know how to treat the casualties, affected by WMD, even more, significant is the knowledge of how to protect themselves in such accidents. These events tend to be unpredictable and unprecedented which makes management guidelines far more likely to be inadequate. Personal protective equipment (PPE) is mandatory when contact with patients affected by certain chemicals and radioactive sources is expected. Experience shows that when effects of the contaminating agent are not immediately obvious, hospital personnel delay the application of PPE or choose an inappropriate one. [8] Not only the choice of PPE but also performing medical activities while wearing it could be challenging. Practice and training should aim to improve all activities assuring the safety of the hospital personnel and the patients. Also, shortfalls in decontamination and isolation might increase the chance for damages among the staff and the patients.

Based on the abovementioned, we set the objective of the study to analyse the healthcare providers' readiness for reaction in case of an incident with weapons of mass destruction.

MATERIALS AND METHODS:

To achieve the set objective, a survey was performed

among 52 respondents. Five dichotomous questions were devised. All respondents were chosen among recognised professionals attending the Master Programme for Healthcare Management of Faculty of Public Health in Medical University Plovdiv.

A comprehensive statistic methodology was applied to analyse the data and externalise observed patterns. Indicators were assessed at the significance level of $P > 0,05$. Quantitative analysis was performed using SPSS 17.0. Data and graphics were processed and presented using MICROSOFT OFFICE products. Descriptive and comparative analyses are applied to depict the challenges weapons of mass destruction pose towards healthcare provision.

RESULTS:

Survey was performed within 52 respondents – both doctors and nurses. The prevalence of the female has to be noted (male - 8, female – 44). All respondents were divided in three age groups – under 35 (n=22), 35-45 (n=22) and 46-55 (n=8). For the purpose of analysing the influence of gained experience versus fresh knowledge, all respondents were divided to those with less than 5 years' work experience (n=14), 6-15 years of experience (n=18) and 16-30 years (n=20).

The questions and the received answers are shown below (table 1):

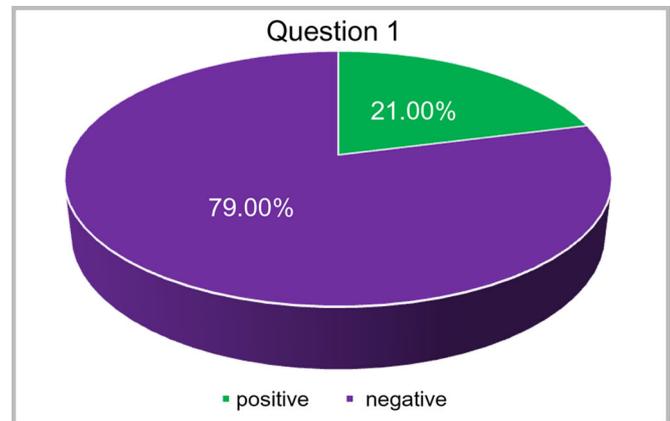
Table 1. Survey questions with respective positive and negative answers.

Questions	Yes	No
1. Are You familiar with Your healthcare establishment's plan for action in case of incidents with weapons of mass destruction?	11	41
2. Are You aware of Your role according to the plan?	16	36
3. Do You know where the PPEs are stored and who is in charge of supplying them?	17	35
4. Do You know what medical information You are supposed to collect, analyze and disseminate in case of use of weapons of mass destruction?	15	37
5. Do You know if your healthcare establishment has medications and consumables in store for medical support in case of CBRN incident?	12	40

The charts, presented below, are depicting the results from the survey.

The first question concerns the information regarding healthcare establishment's plan for action in case of incidents with weapons of mass destruction. Extremely high number of medical professionals are not familiar with the hospital plan for reaction in CBRN contamination – 78.8%. The numbers are most disturbing for the group with 6-15 years of experience (90%), while those with 16-20 years give the best results (68.4%). (fig. 1.)

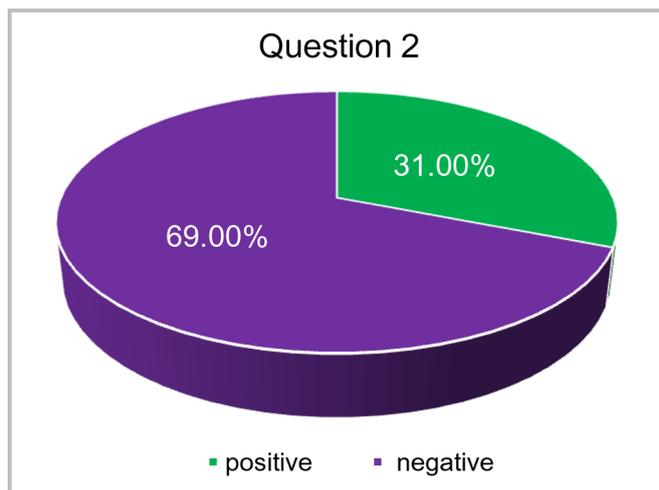
Fig. 1. Respondents' answers on Question 1.



The contingency hospital plan includes the information regarding the whole structure of DMS, including tasks of all staff members, and the majority of the respondents are not familiar with it. Most probably this can explain the poor results to the next question. It is an alarming fact that not much is known about individual assignments.

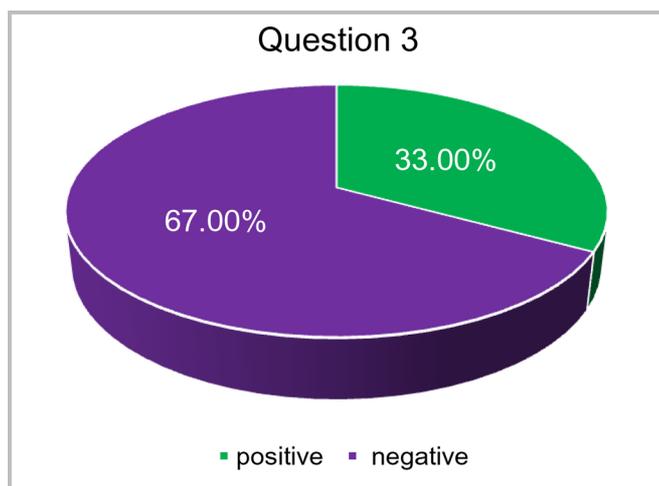
69.2% of the respondents are not informed about their tasks in medical support. There is no statistical difference among groups with different work experience. (fig. 2.)

Fig. 2. Respondents' answers on Question 2.



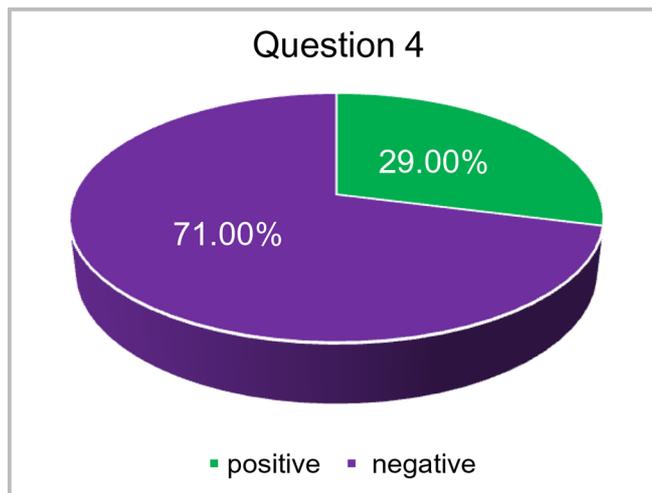
With the third question, we aim to reveal what instructions the respondents have received regarding PPE and how they should obtain it. 67% of the interviewed reported receiving no information. (fig. 3.)

Fig. 3. Respondents' answers on Question 3.



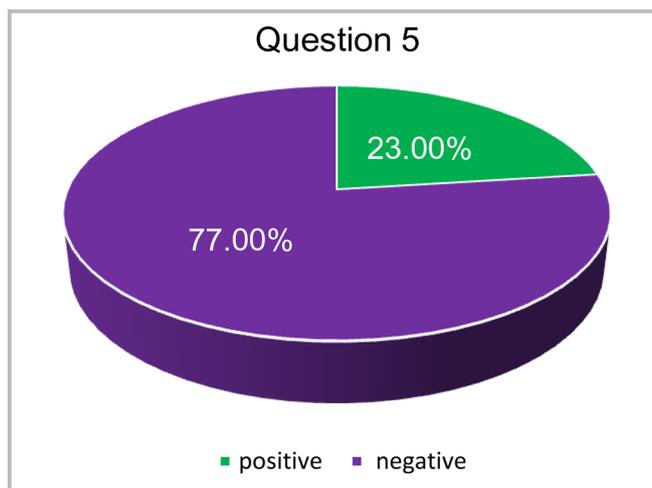
Furthermore, almost the same percentages of the respondents (71%) are not confident what medical information is required of them. Since this process has specifics that do not apply in standard practice, it is questionable whether it could be performed without previous training. (fig. 4.)

Fig. 4. Respondents' answers on Question 4.



Based on this finding, it is not surprising that almost the same number of respondents – 76.9% have no information regarding hospital resources (drugs, consumables, equipment) that are reserved for CBRN incident management. (fig. 5.)

Fig. 5. Respondents' answers on Question 5.



DISCUSSION:

Performed analyses undisputedly reveal the low percentage of certainty among healthcare providers, regarding the planning, organization and execution of medical support in case of incidents with weapons for mass destruction. Medical support requires functioning in environment affected by damaging factors, treating the casualties, protecting staff and patients. These unusual conditions demand changes in normal procedures, described in disaster medical support plan. It contains instructions regarding medical information exchange, the allocated resources and protective equipment.

Major concern is related to the substantial number of respondents, unfamiliar with the hospital contingency plan. This questions the effectiveness of the plan and could be the cause of communication and power failures, water

shortage and contamination, physical damage, hazardous material exposure, unorganized evacuations, and resource allocation shortages.

Lack of certainty about individual roles, as shown by the answers to the second question, indicates that respondents have no proper training. This could cause critical delays in emergency response when teamwork and leadership are difficult to establish. The practice indicates that successful execution of the plan requires solid theoretical knowledge amended with focused, practical training. [9]

One of the important tasks during disaster medical support is collection of medical information and providing the managers with relevant data. Majority of the medical professionals are not confident what this information should be. This raises the question of whether they are aware of the risks that CBRN events pose to themselves and their patients. Also, collection of information is crucial for retrospective study of the event and identification of weak links in the support chain. Such data could be used for the improvement of the organization and practice.

CONCLUSIONS:

Performed analyses highlight the extremely low level of theoretical as well as practical knowledge among the surveyed hospital staff. The survey notes the enormous gaps in both awareness and training regarding medical support in case of WMD incident. Improvement of hospital staff medical information exchange on issues related to WMD medical support plan, medical support activities and resources management is necessary and could provide knowledge regarding activities and resources for proper medical support.

Improvement could be achieved by practical drills related to the pre-planned hospital activities with the entire staff. Both field and table-top exercises, performed on regular bases, could improve preparedness for response in case of disaster. [10,11]

As the number of participants is small, a further research in this field would be plausible.

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