

REVIEW
by Assoc. prof. Nikolina Radkova Radeva, PhD
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Medical University “Prof. Dr. Paraskev Stoyanov”- Varna
Member of Scientific Jury purcuing to order № P-109-594/18.12.2020
of the Rector of the MU-Varna

Regarding: *Dissertation for PhD*

Author: Dr. Rositsa Vasileva Petrova, MD

Subject: The floods – medical and ecological problems for the Danube region

Doctoral program: Disaster medicine

Professional field 7.1 Medicine

Introduction of the procedure and the PhD student

As a member of the Scientific jury and in accordance with Art 69 of the Regulations for academic staff development of MU-Varna, on electronic device, I received a set of materials, including: dissertation, abstract - in Bulgarian and English, list of scientific publications, CV, diplomas, orders, protocols and etc.

Dr. Rositsa Petrova, MD was enrolled as a PhD self-study student by order P-109-286/16.09.2019 of the Medical University – Varna’s Rector in doctoral program „Disaster medicine”, professional field 7.1 Medicine and scientific supervisor prof. Hristianna Romanova, MD, PhD, DSc.

Based on Report of the Head of the Department „Disaster Medicine and Marine Medicine“ and Decision of the Faculty Council of the Public health of MU-Varna, on 18.12.2020, Dr. Petrova completed the program and was entitled to defend the dissertation

Being familiar with the procedure for doctoral program process and education, I believe that the documents meet the requirements of the legal framework and prove the legality and completeness of the conducted training and procedure.

Brief biographical notes

In 1995 the PhD student became a MD in Medical University – Pleven and master of economics in 2004 in Academy of Economics „Dimitar A. Tsenov“ – Svishtov.

In 2009 Dr. Petrova, MD acquired the specialty Occupational Medicine.

In the period 1996 - 2016 she was a MD in the system of pre-hospital care and head of the occupational medicine service.

From 2016 to the present she is an assistant in the Department of Hygiene, Medical Ecology, Occupational Diseases and training sector Disaster medicine.

In 2020 she received second specialty Disaster medicine.

She participated in a project entitled „Study of predictive values of human placental lactogen“.

Fluent in Russian, French and English - at a basic level of proficiency.

Relevance of the topic of the dissertation

The floods are serious challenge for the world population. Among the natural disasters, they are the most common, causing widespread devastation, resulting in loss of life, damages to personal property, critical public health infrastructure and deterioration of hygienic - epidemiological situation.

Flood protection requires risk assessment and innovative approaches to preparedness, response, recovery and mitigation. Awareness and training play an important role in prevention, helping to reduce the negative health and environmental consequences.

There is a real risk of floods in the Danube region. It is essential to be familiar with the hazards, the capacity of the health care system to cope and the knowledge, skills and competencies of the population in case of a dangerous event.

Dissertation structure

The dissertation consists of 168 pages and contains 9 sections: Introduction (2 pages), **Literature review** (34 pages), **Objective, tasks and hypotheses** (1 page) **Material and methods** (5 pages), **Own researches** (97 pages), **General conclusions** (1 page), **Contributions** (1 page), **Literature** (12 pages) and **Supplements** (8 pages).

The dissertation is well illustrated with maps, diagrams, figures and tables.

The sources in the literature are 200, 119 in Cyrillic and 81 in Latin.

The used bibliography shows a good subject knowledge.

In the introduction, Dr. Petrova emphasizes that from all natural disasters, the floods are the most common. Annually, worldwide occur 10 000 floods with various parameters, consequences and losses. In Bulgaria, for the period 2005 - 2020, the floods are 40% of all natural disasters. Risky regions for catastrophic floods in the Danube region are the rivers - Danube, Rusenski Lom, Vit, Osam, Yantra, Iskar and Ogosta.

The literature review is comprehensive. It ends with interesting conclusions and proves the relevance of the problem.

The objective that the PhD student set with the dissertation is essential for solving the problems related to the protection in this type of disasters, namely „To study and analyze the health and environmental problems of the Danube region, as well as the awareness and the degree of readiness of society for proper behavior and protection in case of flood“. The objective is logically derived and correctly formulated.

To achieve the objective, Dr. Petrova, MD, set 5 research tasks. Each of them logically selected and elaborated in detail.

The main thesis of the dissertation is that floods are the main disaster for the Danube region and by raising awareness and preparing the population for protection, their significant negative effects could be reduced.

The research hypotheses have important role for the whole design of the study:

- The floods are main disaster for the Danube region and create a number of negative effects to the community and society.
- The public awareness and preliminary preparation is important to reduce the negative consequences.
- The society in the Danube region needs higher awareness and preparation for disasters (including floods).
- The Bulgarian citizens aged 18-39 are better informed and better prepared for flood protection than people aged 40-60.

Materials and methods

The present study examines mainly the level of awareness and preparation for flood protection of the society from the Danube region (the population of two selected cities: Pleven and Svishtov, located in the Danube region of the Basin Directorate).

The information is collected through direct individual and anonymous survey (inquiry), conducted in the period from May 2019 to May 2020. The data collection by the institutions was conducted in the period from March 2019 to March 2020.

The questionnaire was designed by Dr. Petrova, MD and approved by Disaster medicine and maritime medicine department council, as well as experts from different civil protection services.

The applied methods correspond to this type of researches - historical, documentary, descriptive, comparative and sociological - survey, quantitative and statistical methods.

The own researches are in-depth, sufficient in content.

The own researches first task comprises Danube region flood risk study and risk assessment. They are based on data from registered by the municipal administrations past floods. In the recent years, for the whole country, 1903 floods have been registered. 1028 of them, the experts defined as significant past floods and 573 future, potentially significant.

From 160 surface water bodies, experts define 119 as a „river“ and 41 as a „lake“. From the preliminary risk assessment for the Danube region: 49 water bodies are identified in Risk, 20 in potential risk and 51 in good general condition. The risk assessment year is not specified.

The Danube region preliminary risk assessment includes data for 744 past floods. 629 at the beginning and 115 after in-depth consultations.

Many data are collected and analyzed concerning the Danube region floods specifics and a number of features are noticed. Presented are data for Danube region widespread and extensive floods as well as the affected population, health and environmental problems in certain critical years and months.

For Pleven and Svishtov municipalities, the possible causes of floods are well analyzed. The made conclusions are for the 2005-2020 period.

The second own study researches the medical services tasks (especially health facilities), measures and basic methods for protection in case of floods.

The developed schemes for flood danger announcement in the medical institutions and the principal population triage after disaster concerning treatment and evacuation are useful for the health establishments management.

The conclusions are that the both municipalities - Pleven and Svishtov have a very good organization for rendering medical care in case of floods. Also that the civil protection institutions activities are well organized.

A third study was conducted on the awareness and readiness for protection in case of floods of Bulgarian citizens from the Danube region aged 18 - 39 and 40 - 65 years old. The two age groups were compared.

In the survey, the total number of the surveyed people is 240. They are residing in Pleven district and Svishtov municipality. A sociological method is used to study the awareness and preparedness of the Bulgarian Danube region citizens for floods.

The percentage of unawareness of a potential flood threat is high - young group - 55%, mature - 75%.

The awareness of both groups about the disaster protection plan, part "Floods" is low: in the big towns 30%, in the small ones: 22%, in the villages: 14%.

There is low awareness about the organization of the assistance in case of floods: 18-39 years - 47% and 40-64 years - 38%.

Interesting are the conclusions that approximately twice as many young groups (52%) as adults (31%) take out home and property insurance in advance.

Awareness of measures to prevent an epidemic after a flood is close and very good in both groups - 70% correct answers.

The self-esteem for sufficient knowledge and skills regarding adequate behavior and flood protection is low. Young age group - 36%, mature age group 18%.

An essential part of the dissertation are the protocols for hospital preparedness in case of flood risk in and outside the flood zone.

The following are developed in detail:

- Management activities.
- Staff activities.
- Patients activities in case of need for evacuation.
- Calculation on a monthly basis of the necessary vehicles for evacuation of patients and staff.

Targeted and substantial recommendations have been made to the following institutions:

- General Directorate „Fire Safety and Protection of the Population“.
- The mayors of the two municipalities of Pleven and Svishtov.
- Employers from both municipalities.
- Media.
- Ministry of education.
- Bulgarian Red Cross.
- Pleven Basin Directorate.

The general conclusions prove the relevance and significance of the own studies.

The dissertation has a significant number of illustrative materials - figures, schemes, maps, etc.

The dissertation contributions are important, with practical focus.

Scientific-theoretical:

- The dangers of major floods for the Danube regions have been studied and the potential risk has been assessed.
- All possible health consequences and environmental hazards for the society have been thoroughly analyzed. The main measures and means for flood protection are presented.
- Two schemes have been proposed: for early warning and notification of the danger of floods in hospitals and a basic organizational scheme for the initial distribution of the affected population for evacuation and treatment in hospitals.
- Presented for implementation are the main preventive measures in the activity of the medical - prophylactic establishments in order to reduce the negative effects and to limit the occurrence of epidemics during and after floods.
- Sociological surveys of awareness and readiness for flood protection have been conducted for two age groups 18 years - 39 years and 40-64 years of Bulgarian citizens from the Danube regions and the obtained results are compared.

Scientific-practical:

- Protocols have been developed for the preparation of Medical Establishments (hospitals) in the areas and outside the flood zones.
- The actions and responsibilities of the management, medical staff, transport and patients at risk in the area and outside the flood area are defined.
- Two types of leaflets with recommendations for the development of plans for protection of personnel from sites and companies in case of floods have been developed and distributed.

- The medical establishments (hospitals) from the Danube region are systematized in flooded and non-flooded zones for the rivers Danube, Iskar, Zlatna Panega, Beli Vit, Gostilya and Lomya.
- Insufficient awareness, low self-esteem for knowledge and skills regarding proper behavior and protection against floods in sociological surveys among 240 Bulgarian citizens from two age groups 18-39 years and 40-64 years of the Danube regions have been proven and analyzed.
- Proposals have been developed for:
 - General Directorate „Fire Safety and Protection of the Population“ - to periodically acquaint the public in the region with the rules for proper behavior in floods and to develop thematic courses and training sessions for all age groups in flood protection.
 - The mayors of the two municipalities of Pleven and Svishtov – have to improve the communication between municipalities, population and private sector before, during and after floods and to organize and conduct annual cleaning of the riverbeds.
 - Employers from both municipalities - to create good practices in the training of all workers and employees in protection and proper behavior in emergencies and floods.
 - Media - to raise the general awareness of the public about the disaster protection plan, part „Flood“, to increase their activity and participation in the awareness and training of the population in both municipalities for proper behavior and protection.
 - Ministry of education - development and approval of mandatory training programs for all students of higher education for proper behavior and protection in case of floods and other disasters.
 - Bulgarian Red Cross - to carry out synchronization between the Bulgarian Red Cross and all institutions involved in the rescue operations.
 - Pleven Basin Directorate - to carry out targeted group work among young and mature age groups on the risk of drowning in periods with and without flooding in the Danube, Iskar and Vit rivers.

The 3 publications are related to the dissertation. They are developed together with the scientific supervisor and other authors, which emphasizes the in-depth and extensive scope of the doctoral student researches.

The supplements are up-to-date and very informative.

Personal impressions of the PhD student:

I know Dr. Petrova personally and my impressions are that she successfully cope with the research development and the defense of the main thesis, showing great activity, depth, purposefulness and efficiency.

Abstract

The abstract consists of 51 pages. It meets the requirements and reflects the main results achieved within the dissertation.

Brief remarks and recommendations

I have no significant critical remarks and recommendations for the dissertation. Some terms do not correspond to the generally accepted terminology regarding disasters. There are spelling and punctuation errors, negligence of the formatting, which do not impact the scientific value and significance of the dissertation.

I would recommend, more detailed and upgraded study on the disaster preparedness and response capacity of the healthcare services in the Danube region.

Conclusion

Based on the dissertation analysis, the assessment of the carried researches, as well as my personal impressions, I stated that Dr. Petrova successfully completed the scientific objectives.

Additionally, the dissertation „The floods – medical and ecological problems for the Danube region” meets the legal requirements of the National Academic Development Law and Medical University–Varna’s Regulations for academic staff development for obtaining PhD in Disaster medicine.

Accordingly, I give my positive assessment and would propose to the members of the Honorable Scientific jury to award Dr. Rositsa Petrova with the educational and scientific degree “Doctor” in Disaster medicine, Professional field 7.1 Medicine.

Signature:

(Assoc. prof. Nikolina Radexa, PhD)

