STATEMENT

From

Assoc. Prof. Greta Velikova Koleva-Petkova, PhD

Faculty of Public Health and Healthcare, Department of Healthcare

"Angel Kanchev" University of Ruse

Member of the Scientific Jury according to Order P-109-508/29.11.2023

of the Rector of Medical University – Varna

Regarding the doctoral thesis on: **Raising Awareness of Radiation Risk in Medical Diagnostics and Therapy**, by Stanislava Milcheva Mavrodinova in higher education area 7. Healthcare and Sports, 7.4. Public Health – professional field; Scientific Specialty Healthcare Management. Scientific supervisor on thesis research –Assoc. Prof. Anna Georgieva, PhD and Assoc. Prof. Veselina Slavova, PhD.

Outline of the procedure

Stanislava Milcheva Mavrodinova was enrolled as a full-time doctoral student to pursue the educational and scientific degree "Philosophy Doctor" in Healthcare Management by Order No. 109-499 dated 04.11.2020 of the Order of the Rector of MU-Varna. She was given authorisation to defend her doctoral thesis by Order No. 109-508/29.11.2023 of the Rector of MU-Varna. The Rector's order was based on the Minutes Summary No. № P-109-446/14.10.2021 of the Department of Nursing Care for successfully passed doctoral examinations. She was deemed to be ready for public defence of her doctoral thesis by the Scientific Jury as well.

Biographical data and career profile

Stanislava Milcheva Mavrodinova graduated from the Medical College in Plovdiv in 1999 with a Bachelor's degree in X-ray laboratory specialist. She obtained a Bachelor's degree in Social Services (2003) at St. Cyril and St. Methodius University of Veliko Tarnovo, a Master's degree in Public Health (2008) at the Medical University of Varna and a Master's degree in Healthcare Management" (2014) at the same university. In 2020/2021, she specialised in Public Health studies at the MU–Varna.

Her professional activity as an X-ray laboratory technician started in 1999 at the Imaging Diagnostics Department, Naval Medical Academy – Varna, until 2000. She worked at the St. Clementine Diagnostic Clinic in Sofia (2000-2004), St. Anna Hospital – Varna (2004–2010), and Rusev Medical Diagnostic Laboratory (2005-2007). From March 2009 to October 2020, she was a lecturer at the Medical College Varna in the X-ray Laboratory Assistant educational sector. Varna. From November 2020 till now, St. Mavrodinova has held the position of Assistant Professor.

Stanislava Mavrodinova is a member of a number of scientific and professional organisations: the Bulgarian Association of Healthcare Professionals; the Bulgarian Public Health Association; the Bulgarian Association of Laboratory Technicians in Imaging Diagnostics and

Therapy; the Bulgarian Association of Radiology; the European Federation of Radiographer Societies (EFRS) and the International Society of Radiographers and Radiological Technologists (ISRRT).

The thesis developed by Stanislava Mavrodinova is presented on 147 pages; it is classically structured according to the standard requirements. The thesis includes the following sections: Introduction; Literary review – relevance of the issue, historical overview and current state; Methodology of scientific research; Results and Discussion. Authors' innovative tools and models for raising the awareness of medical professionals and patients about the risk of ionising radiation for medical diagnostics and therapy are also presented, along with an expert evaluation of the proposed innovative tools and models. Conclusions, Proposals and Contributions from the thesis are summarised. The thesis is richly illustrated with 41 figures, 1 table and 4 appendices. The bibliography contains 279 references, 47 of them in Cyrillic and 232 in Latin.

Relevance of the subject

Increasing the quality of medical services is associated with introducing new methods of treatment and diagnostics in medicine, including imaging diagnostics and radiotherapy. An increasing number of tests requiring higher individual doses of ionising radiation are being applied. This makes it necessary to reduce the risk associated with radiation exposure. Patient awareness is essential to make an informed consent decision. The focus is on exploring ways to enhance patient awareness of the risk of ionising radiation for medical diagnostics and therapy, which confirms the relevance of the thesis subject.

Literature review

The author provides a historical overview and analytical review of the literature in regard to the current state of the matter of ionising radiation in medical diagnostics and therapy – Chapter One, which is 54 pages long. X-ray examinations and diagnostic procedures using ionising radiation sources in modern healthcare are discussed. The doctoral student presents international standards and best practices in the process of organising, documenting and systematising information related to radiation risk in medical diagnostics and therapy. The process of informing patients and obtaining their informed consent has been outlined in an international context. In this piece, the author investigates the way information regarding radiation risk is organised, documented, and systematised in Bulgarian medical practices. It focuses on the procedures in Bulgaria for informing patients and obtaining their informed consent and considers the potential involvement of radiology laboratory technicians in the process. The literature review gives a thorough overview of the key topics addressed in the thesis.

Methodology

Chapter two of the thesis concisely presents the research methodology in 10 pages, including the aim, tasks, research hypotheses, object and subject, the scope of the study, stages and organisation of the study, research methods and tools.

The aim of the thesis research is clearly stated. In order to achieve its goals, the doctoral research is accompanied by 8 specific tasks. The scope of the study is defined, covering 370 individuals divided into four groups of respondents. The first group consisted of 152 patients who underwent X-ray examinations and procedures in outpatient medical facilities. The second

group consisted of 100 specialists from inpatient and outpatient medical care (general practitioners and physician specialists). The third group comprised of 103 X-ray and laboratory technicians from inpatient and outpatient medical care. The fourth group included 15 imaging specialists.

The inclusion and exclusion criteria for each group are presented in detail; the voluntary and random selection principles are applied. The research was approved by the Research Ethics Committee (REC) of the Medical University – Varna (Protocol № 115/31.03.22). The study has a total duration of 3 years.

The thesis design includes two main components – a theoretical and empirical study. A quantitative survey among medical professionals and patients was applied, and an author's toolkit in the form of questionnaires was developed. The key areas of research are presented. The research stages are set out in tabular form and reflect the specific activities and timeframe of their implementation. A sociological method has been used by applying a direct anonymous individual survey and a semi-structured interview (an author's proprietary survey tool) and statistical methods that allow us to make valuable measurements and conclusions. The data in this study were processed using IBM Statistics – SPSS for Windows, ver. 20.0 statistical package.

Results and discussion (author's research)

In the third chapter, the results of the author's research are presented on 51 pages. The socio-demographic characteristics of the studied groups of respondents – patients, radiology laboratory technicians and imaging specialists, are presented. Considering the significance of the frequency of X-ray tests and the impact of cumulative doses on a patient's health, the number of procedures within a calendar year is examined using data from the patients themselves. Patients' awareness of diagnostic tests using ionising radiation was investigated through the opinions of patients, X-ray technologists and specialists. Statistical differences were found in the views of specialists by gender and place of work – inpatient and outpatient medical facilities. Awareness level was statistically related to patients' educational background. The results show an extremely low proportion of patients aware of the use of ionising radiation and the risk of radiation exposure in standard imaging examinations. Most subjects in the different groups acknowledged the benefit of awareness of the ionising radiation received during a radiological exam. A statistically significant difference was found in the opinions of the three groups of respondents regarding the discussion of risks. The results indicate patients' expectations towards the radiology laboratory technician for obtaining information. The majority of radiographers and specialists believed that obtaining informed consent should be done by a radiology technologist. Concern was raised about a significant number of patients relying on the Internet for specific medical information. It is worth mentioning the negative result regarding the provision of additional training for the administration of ionising radiation as opposed to X-ray laboratory technicians.

The fourth chapter of the thesis presents innovative tools and models for raising the awareness of medical professionals and patients about the risk of ionising radiation for medical diagnostics and therapy. The author proposes a **Model of a unified form for obtaining informed consent from the patient for an X-ray examination - mammography**. The unified form is consistent with the current legislation of the country and the models of technical slips developed by other authors, which have been correctly cited.

The developed Model Form is an original document, with structure and content reflecting all the necessary requisites of the written form for obtaining informed consent from the patient. The form combines personal information about the patient and the patient's next of kin, the information to be provided to any patient undergoing mammography, and a Statement of Informed Consent.

A Model of a Patient's Radiation Passport has also been proposed for collecting and storing individual radiation exposure data.

The author has consulted experts to assess the proposed innovative tools and models to ensure applicability and informative value. The majority of experts support the idea of implementing the proposed unified model for obtaining informed consent from the patient while suggesting some additions. Unanimous approval is also given to the developed Patient Radiation Passport Model.

The experts evaluated the importance and practicality of implementing both models, with the assurance that they will enhance healthcare standards.

The doctoral student has made **suggestions and recommendations** to the Ministry of Health, the Medical Universities and the Bulgarian Association of Healthcare Professionals, which I consider adequate.

Based on the thesis research, **theoretical and practical contributions** reflecting the scientific achievements of the author have been made, which I accept.

The thesis summary accurately and comprehensively reflects the thesis' content. It is developed within 71 pages and is sufficient to gain insight into the quality and content of the thesis. A list of 2 scientific publications and contributions related to the thesis topic is provided.

General impressions

Both the thesis and its summary are composed using precise and concise language, avoiding repetition and adhering to scientific accuracy. The PhD student has gone into depth regarding the research issues, which shows that she has a good scientific background and can correctly interpret and analyse her research results and compare them with those of other authors. In addition to that, the presentation's literacy and well-crafted thesis contribute to a highly favourable impression.

I do not know the PhD student Stanislava Mavrodinova personally. My impressions were shaped by the materials and thesis that were presented to me. I believe that she is distinguished by purposefulness, consistency, precision in her work, and expertise. It takes a truly dedicated and skilled professional to make significant advancements in healthcare by improving the quality and safety of patient diagnostics and therapy.

Conclusion

This thesis is presented in a complete and well-structured form. The thesis research is distinguished by its originality and significant contribution to the activities of radiology technologists and patient awareness, as well as to ensuring radiation safety in medical practice.

Based on the overall evaluation of the documentation provided, I believe that the PhD student fully meets the requirements of the Development of the Academic Staff in the Republic of Bulgaria Act in Bulgaria and the rules and regulations of NACID. Considering everything, I feel positive in giving my affirmative vote for awarding the educational and scientific degree "Philosophy Doctor" in Healthcare Management to Stanislava Milcheva Mavrodinova.

11/01/2024

Ruse

Prepared by: .....

Assoc. Prof. Greta Koleva, PhD