

НАЦИОНАЛЕН ЦЕНТЪР ПО ОБЩЕСТВЕНО ЗДРАВЕ И АНАЛИЗИ	
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STATEMENT

by **Lidiya Ilieva Hristova, PHD, MD**

associate professor at the Department of Occupational Medicine at the Faculty
of Public Health Prof. Tsekomir Vodenicharov, PHD, MD

at Medical University - Sofia

of a dissertation for awarding the educational and scientific degree "Doctor"

professional direction - 7.1. "Medicine"

scientific specialty: "Hygiene"

Author: Ralitsa Ivaylova Stoyanova

Form of doctoral studies: self-study

Scientific organization: National Center for Public Health and Analysis,
Department of Occupational Health, Directorate of Public Health and Health Risk

Topic: Stress and work capacity in healthcare professionals in hospital care

Research supervisor: associate professor Katya Vangelova, PhD in Biology

I. General presentation of the procedure and the PhD student

The set of paper and electronic materials presented by Ralitsa Stoyanova is in accordance with the Regulations for the conditions and procedures for acquiring scientific degrees and holding academic positions in the National Academy of Sciences of Sofia - Sofia.

The doctoral student has attached 6 Publications and 6 materials from participation in scientific forums at home (1) and abroad (5).

II. Brief biographical data of the doctoral candidate

Ralitsa Ivaylova Stoyanova was born on 21.04.1985. She completed her higher education at Sofia University "St. Kliment Ohridski", in the Faculty of Biology, in 2008 as a bachelor in molecular biology, and in 2009 as an ecologist - master in environmental protection. She participated in the workshop "Light, Health and Shift Work" in 2016, organized by the Federal Institute for Occupational Safety and Health Dortmund, Germany. She received training in 2017 on the topic of "Methodology of the scientific research process", and in 2021, a workshop on "Strengthening the protection of health workers in response and recovery from COVID-19" at the National Center for Public Health and Analysis, Sofia. In 2022 and 2023, she participated consecutively in online seminars and a conference on the following topics: "Pre-briefing session 1 of 2 - WHO Guideline & WHO ILO Policy Brief on Mental Health at Work"; "Psychosocial risk in (un)expected places" and "Work-Related Psychosocial Determinants On Mental Health. She participated in a joint project of the WHO and the National Institute of Health, Sofia, in 2023 on the topic: "Recognition and prevention of burnout syndrome".

III. Actuality of the subject matter and the set goals and tasks

The topicality of the topic is determined by the importance of stress at work, the second most common health problem after musculoskeletal complaints; cause of more than 50% of lost work days in the European Union, for presenteeism and increased traumatism. Approximately half of working Europeans accept stress as a common occurrence in their workplace. High levels of stress in health care professionals are determined by a number of psychosocial risks such as: shift and night work, long working hours, overtime, physical workload, emotional stress, lack of support from colleagues and supervisors, threat of violence, which contribute to the number of psychosomatic complaints.

The goal is formulated specifically and clearly, namely: "Assessment of stress and work capacity and the occupational risk factors that determine them among health care specialists in the hospital care of the city of Sofia". In connection with it, five tasks are foreseen. They are aimed not only at determining the subjective assessment of working conditions and tracking work-related psychosocial risks and resources, but also at assessing emotional and physical exhaustion and psychosomatic complaints in the main professional groups (nurses, midwives, medical laboratory technicians) in different types of hospitals.

Until now, there has been no objective assessment of stress, through the cortisol indicator, tracking its concentrations in saliva in the dynamics of the working day, as well as assessment of work ability and its determinants, through the work ability index developed by the Finnish Institute of Occupational Health, due to which Ralitsa Stoyanova's dissertation is of scientific value and great practical application.

IV. Knowing the problem

The literature review used 172 sources, of which 14 are in Cyrillic, arranged in alphabetical order of the authors. The information is perfectly synthesized, which shows the good knowledge of the subject and the professional maturity of the doctoral student. Terminology, models of occupational stress, psychosocial and occupational risk factors of contingent studies are presented. The mechanism of stress-response is described in detail, as well as the correlations of health workers exposed to high workload and chronic stress and changes in stress biomarkers (cortisol and sAA). The overview describes in detail the impact of stress and shift work on workers' health, as well as the concept of work capacity. In the conclusion, the doctoral student applies valid arguments for the choice of the developed topic.

V. Research methodology

The current study covers 1,811 healthcare professionals working in 19 hospitals in the city of Sofia. Data are presented from a questionnaire based on the short version of the German Health Professional Stress Analysis Tool for subjective health assessment, psychosomatic complaints, and how often health professionals felt emotionally and physically exhausted in the past 4 weeks (SHORT COPSOQ II). Added questions from the doctoral student, about work at a high pace and pressure and when it is necessary to maintain constant concentration, as well as about problems in family life related to professional duties.

The concentration of cortisol in saliva of a group of 48 hospital nurses working in the intensive care unit and clinical wards was monitored by ELISA kits (ELISA cortisol in saliva EQ 6141-9601 S) of Euroimmun, Germany. During the sampling hours, a survey was also carried out to assess the stress, sleepiness and fatigue of the studied group of health professionals.

A reliable and informative tool "Workability Index" was used to compare results between different occupational groups and populations and to develop measures to maintain and improve workability.

The statistical package SPSS 23.0 was applied to enter the data and process the results. ANOVA, χ^2 , stepwise multiple regression analysis, correlation analysis were used for statistical analyses.

The detailed description of the methods testify to the skills and experience that Ralitsa Stoyanova has acquired during the development of the dissertation work. The selected statistical methods for data analysis are appropriate and fully adapted to the tasks set.

VI. Characteristics, results and evaluation of the dissertation work

The dissertation is structured according to the requirements and is written on 141 standard pages, illustrated with 30 figures and 31 tables, including: title page, content and abbreviations used - 5 pages; literary review - 25 pages, including 2 figures; purpose and tasks - 1 page; contingent and methods of 7 pages and 2 tables; results and discussion - 73 pages, richly illustrated with 29 tables and 28 figures; conclusions - 2 pages; scientific - theoretical and applied contributions - 1 page; literature - 16 p.

The achieved results are presented in accordance with the implementation of the set five tasks to achieve the set goal, and the obtained results are successively discussed.

The author found that medical professionals rated their health as good or very good, but noted a relatively high number of psychosomatic complaints, the most common being anxiety, fatigue, memory problems, back pain and sleep problems. Tracking cortisol, as a biomarker of stress, confirms the data of high levels of stress in nurses. The index of work ability found excellent and good work ability among health care specialists (71.9 %), higher among midwives (82.5 %) and laboratory technicians (79.8 %). Factors determining work ability are defined: subjective assessment of health, problems in the family, emotional and physical exhaustion, support from colleagues and work experience.

During the discussion, the doctoral student makes a thorough analysis of the obtained results and compares them with the publication on the subject by other authors. The conclusions fully reflect the results obtained. The text of the dissertation is written in analytical language, with a logical and meaningful connection between the individual parts, and the bibliography has sufficient data on the cited publications.

VII. Contributions and significance of the development for science and practice

Contributions of a scientific-theoretical and scientific-applied nature are well formulated.

VIII. Assessment of dissertation publications

The PhD student presents a total of 6 publications, 5 in refereed journals and one with IF. Ralitsa Stoyanova is first author in 4 of the publications, second in 2 and third in one article. Total citations 4, of which 2 in Scopus. Participation in 6 scientific forums, of which 4 abroad and 2 in our country. Publications and participation in scientific forums reflect the results of Ralitsa Stoyanova's research.

IX. Personal participation of the doctoral student, originality and authenticity of the dissertation work.

The originality of the dissertation work is confirmed by the first used in the Republic of Bulgaria: work capacity index for assessing the work capacity of health care specialists; as well as tracking salivary cortisol levels in nurses during the day and night shift to confirm the subjective assessment of high stress levels.

X. Abstract

The abstract is 32 pages and is illustrated with 5 tables and 9 figures. It is structured correctly, according to the requirements of the relevant regulations and reflects the main results achieved in the dissertation.

XI. Critical remarks and recommendations

I have no significant objections to the presented dissertation work, which is developed in a good style. One of my recommendations is regarding the description of occupational risk factors in health care, and more precisely in the physical factors section, it is not appropriate to include slips, trips and falls under

this group of risk factors. In the design of the study, there is no information about the time of execution of the performed tasks. In one of the texts, an incorrect segmentation is noticeable.

These remarks do not change the essence and significance of the dissertation work.

XII. Personal impressions

I do not personally know the PhD student Ralitsa Ivaylova Stoyanova.

XIII. Recommendations for future use of dissertation contributions and results

In order to promote the results of the dissertation work to a wider range of specialists, it is appropriate to publish the work in a monograph, in order to use the scientific and scientific-applied contributions of the dissertation research for occupational medicine practice.

XIV. Conclusion

Ralitsa Ivaylova Stoyanova's dissertation examines a very current problem in modern occupational medicine. The achieved scientific, scientific-applied and applied results represent an original contribution to the implementation of scientifically-based risk prevention measures related to psychosocial risks, stress and the spread of burnout syndrome.

The work complies with the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for the Implementation of (PPZRASRB) and the Regulations for the Terms and Procedures for Acquiring Scientific Degrees and Holding Academic Positions in the National Academy of Sciences - Sofia.

The dissertation shows that the doctoral student Ralitsa Ivaylova Stoyanova possesses in-depth theoretical knowledge and professional skills in the

scientific specialty "Hygiene", demonstrating qualities and skills for independent conduct of scientific research.

Due to the above, I confidently give my positive assessment to the dissertation work submitted for review with the achieved results and contributions, abstract, publications, participations and scientific forums, and I propose to the honorable scientific jury to award the educational and scientific degree "Doctor" to Ralitsa Ivaylova Stoyanova in professional field 7.1. "Medicine" in the scientific specialty "Hygiene".

16/02/2024

Prepared:.....

(Assoc. L. Hristova, PhD, MD)