

REVIEW

by

Assoc. Prof. Zhenya Ruseva Petrova, MD

Department of General Medicine, Varna Medical University

regarding dissertation for the award of the educational and scientific degree "Doctor" Field of education: 7. Health and sports, professional field: 7.1 Medicine by scientific specialty: General medicine

with author **Dr. Gergana Vaneva Apostolova**

on the topic "Vaccination behavior of Bulgarian general practitioners with a focus on the human papillomavirus vaccine" with scientific supervisors: Prof. Dr. Radost Asenova, MD, Assoc. Prof. Dr. Dimitar Nikolov, MD

By Decision of the Chairman of the Scientific Jury and in accordance with Order of the Vice-Rector of the Research Institute of MU-Plovdiv No. R- 7252 of 23.12.2025, I am determined to present an opinion on the dissertation work of Dr. Gergana Vaneva Apostolova on the topic "Vaccination behavior of Bulgarian general practitioners with a focus on the vaccine against human papillomavirus" for awarding the educational and scientific degree "Doctor" in the scientific specialty of General Medicine .

This statement has been developed and presented in accordance with the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria and the Provisional Act on the Development of the Academic Staff in the Republic of Bulgaria.

Brief biographical data of the doctoral student.

Dr. Gergana Vaneva Apostolova graduated as a Master of Medicine at the Medical University of Plovdiv in 2019. Since 2022, she has been a doctoral student in General Medicine. In 2024, she acquired a specialty in General Medicine .

The doctoral student began her career in 2018 as a Health Assistant at the Medline Clinic Hospital in Plovdiv. In 2019-2020, Dr. Apostolova worked as a resident physician in the Endocrinology Department of the same hospital. In 2020, she began specializing in General Medicine at the AIPPMP "Dr. Gergana Dzhangozova" EOOD. Since 2024, she has been working as a general practitioner at the AIPPMP "Dr. Elenski" EOOD in Plovdiv, and since the same year she has been an assistant professor at the Medical University of Plovdiv, Department of Urology and General Medicine.

Significance and relevance of the topic being developed:

The dissertation work of Dr. Gergana Vaneva Apostolova addresses a current and important practical problem with interdisciplinary significance. Vaccination is one of the most effective tools of public health, and infection with human papillomavirus (HPV) is a leading cause of cervical cancer and other anogenital and oropharyngeal malignancies. Despite the introduction of a National Program for Primary Prevention of Cervical Cancer and the provision of a publicly funded HPV vaccine, vaccination coverage in our country remains one of the lowest in Europe. The initial moderate interest was quickly followed by a decline, influenced by

disinformation campaigns, low health culture and distrust of vaccines. In this sense, the role of GPs is fundamental. They are the main implementers of immunization programs, maintain long-term relationships of trust with patients and are often a decisive factor in making a decision to vaccinate. This makes Dr. Apostolova's dissertation work extremely relevant.

Volume and structure: The dissertation of Dr. Gergana Apostolova was written on 207 standard pages, illustrated with 20 figures and 48 tables. The bibliography is presented by 267 literary sources. It ends with conclusions that support the need for research on the dissertation topic. The issues and content of the work are dissertable and of interest not only to physicians specializing in General Medicine, but also to a wider circle of specialists in the field of vaccine prophylaxis.

The literature review consistently examines the basic concepts of vaccine prophylaxis, as well as the role of GPs in solving the basic problems in this area. The Bulgarian and global experience in applying the vaccine against human papillomavirus is reviewed.

Research methodology: The aim of the study is to investigate the vaccination behavior of general practitioners in Bulgaria, with a special focus on the attitudes and practices related to recommending the human papillomavirus vaccine. The study aims to identify the psychosocial determinants influencing vaccination behavior, as well as to validate an instrument for its measurement in the Bulgarian context.

To achieve this, the doctoral student has identified 5 main objectives for achieving it:

1. To carry out linguistic and cultural adaptation of the Pro-VC-Be (Health Professionals Vaccine Confidence and Behaviors) questionnaire in Bulgarian.

1.1 Assessment of the reliability and internal consistency of the Pro-VC-Be questionnaire Bulgarian version

2. To analyze the vaccination behavior of general practitioners in Bulgaria

2.1 To analyze the degree of recommendation of different vaccines in routine practice

2.2 To analyze data on personal vaccination activity among general practitioners

3. To investigate the psychosocial determinants that influence the vaccination behavior of general practitioners.

3.1 Perceived risk of vaccines

3.2 Complacency

3.3 Perceived benefit-risk of vaccines

3.4 Perceived collective responsibility

3.5 Trust in official health authorities

3.6 Perceived Barriers to Vaccination

3.7 Openness to Patients' Vaccine-Related Concerns

3.8 Professional belief and norm. Commitment to patient vaccination

3.9 Effectiveness in Addressing Vaccine Hesitancy

3.10 Reluctant trust

4. To assess the attitude and beliefs of general practitioners in Bulgaria towards the human papillomavirus vaccine

4.1 To identify barriers that prevent general practitioners from recommending the human papillomavirus vaccine.

5. To develop an intervention model based on the results obtained, with the aim of increasing the confidence and commitment of general practitioners in recommending the human papillomavirus vaccine, taking into account the established psychosocial determinants and identified barriers.

The results obtained are presented in text and through 48 tables and 20 figures. The statistical processing used is adequate. The discussion is thorough and well systematized, the own results are compared with international ones on the obstacles and optimization of vaccine prophylaxis against human papillomavirus in General Medical Practice. It is in this chapter that the good awareness and rich clinical experience of Dr. Apostolova, and her capabilities for critical analysis of the results obtained, are evident. The presented own results are completely sufficient for the fulfillment of the objectives set.

The conclusions are 11 in number and logically follow the obtained results. They are well formulated, clear and precise.

The exhibited contributions are 15 in number, divided into three groups:

Contributions of an original nature

1. For the first time in Bulgaria, the Pro-VC-Be instrument has been adapted, culturally and psychometrically validated. The Bulgarian version measures vaccine confidence, risk perception, vigilance, and vaccination behavior. The instrument retains the conceptual structure of the original questionnaire and demonstrates excellent validity and reliability indicators.
2. The first national quantitative profiling of the vaccination behavior of Bulgarian GPs has been carried out, covering the frequency of discussion, recommendation and prescription of routine and recommended vaccines, including the HPV vaccine, pertussis in pregnant women, meningococcal and booster COVID-19 vaccines.
3. Identified is U-shaped dependence between labor internship, adopted risk and understated vigilance, as highest sensitivity to the risk is observed in doctors with the shortest and longest experience, which for the first time describes a nonlinear model of vaccine risk perception among GPs.
4. Vaccines developed in emergency settings have been shown to have a specific risk profile, with almost half of physicians expressing doubts about their safety. These perceptions have been shown to significantly reduce the likelihood of recommendation—a mechanism that has not been studied in a national context.
5. Established is statistically significant connection between perceptions risk from vaccines and the frequency of vaccination recommendation, with physicians who recommend less often more often admitting the possibility of autoimmune or other serious complications — new empirical confirmation that individual beliefs influence clinical practice.
6. Identified is geographical model, according to which General Practitioner, serving patients in the cities manifest bigger sequence and regularity in the discussion and

- prescribing on HPV the vaccine in comparison with colleagues you from rural areas.
7. For first road is described the profile on General Practitioner in Bulgaria, characterizing is with high self-esteem, confidence when discussing vaccines with hesitant patients, and strong internal motivation to develop additional communication skills and approaches.

Confirmatory contributions

Contributions of an applied nature

Conclusion

The developed dissertation meets the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations on the Development of the Academic Staff at MU - Plovdiv.

Based on the presented results and contributions, I give a positive assessment and support the awarding of the educational and scientific degree "Doctor" to Dr. Gergana Yaneva Apostolova.

08.01.2026

Prepared the review:


Затворено за подписване
№ 5 91, 0 "B" Персонален ИС32016/878

Assoc. Prof. Zhenya Ruseva, MD

