REVIEW

by Prof. Makreta Todorova Draganova, PhD

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Vice-Dean for Education, Quality and Accreditation,

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member of the Scientific Jury appointed by Order No. R-109-322/30.09.2026 of Prof. Dimitar Raykov, MD, DSc, Rector of the Prof. Dr. Paraskev Stoyanov Medical University – Varna, and designated to prepare a review pursuant to Protocol No. 1/13.10.2026 of the Scientific Jury meeting

SUBJECT: Defence of the dissertation entitled **Knowledge, Attitudes and Practices Related to Antimicrobial Resistance in Dermatological Care**, prepared by Denitsa Ivanova Dimitrova, a full-time doctoral student in the doctoral programme in Public Health Management, higher education field 7. Health Care and Sport, professional field 7.4. Public Health, at the Department of Social Medicine and Health Care Organisation, Faculty of Public Health, Medical University – Varna.

Research supervisors:
Prof. Klara Georgieva Dokova, MD, PhD

1. General overview of the procedure and the doctoral candidate

By Order No. R-109-48/27.01.2023 of Prof. Valentin Ignatov, MD, PhD, Rector of Medical University – Varna, Denitsa Ivanova Dimitrova was enrolled as a full-time doctoral student in the doctoral programme in Public Health Management, higher education field 7. Health Care and Sport, professional field 7.4. Public Health, at the Department of Social Medicine and Health Care Organisation, Faculty of Public Health, Medical University – Varna. The duration of the programme is three years, commencing on 01.02.2023.

The documentation includes the records of the foreign language examination and the examination covering the minimum doctoral requirements.

By Order No. R-109-322/30.09.2026 of Prof. Dimitar Raykov, MD, PhD, Rector of the Prof. Dr. Paraskev Stoyanov Medical University – Varna, on the basis of Report Ref. No. 102-2154/21.09.2026 submitted by Assoc. Prof. Nataliya Vasileva Usheva, MD, PhD, Head of the Department of Social Medicine and Health Care Organisation, the Faculty Council decision recorded in Protocol No. 266/23.09.2026, and Report Ref. No. 104-1602/28.09.2026 submitted by Prof. Teodora Todorova Dimitrova, MD, PhD, Dean of the Faculty of Public Health, Denitsa Ivanova Dimitrova completed her doctoral studies with the right to defend her dissertation, and the members of the Scientific Jury were appointed.

The set of materials submitted in hard copy and electronic format complies with Article 69 of the 2022 Regulations for the Development of the Academic Staff at the Prof. Dr. P. Stoyanov Medical University – Varna and includes all the required documents.

Denitsa Dimitrova was born in 1982 in Dobrich. She graduated in Kinesitherapy with a Bachelor's degree in 2004 and a Master's degree in 2005. In 2014, she completed a Professional Bachelor's degree in Medical Cosmetics at Medical University – Varna.

The doctoral candidate began her professional career in physiotherapy at Medica-Albena Medical Centre EAD, Albena resort (2005–2008). From 2009 to 2013, she worked as a physiotherapist and cosmetician at Angel Face – Beauty Salons OOD, Varna, followed by a brief period of four months as a physiotherapist at Skin Line Varna OOD, Varna. Since 2013, she has worked as a manager, initially at Salon Pret A Porter EOOD (2013–2016) and subsequently at TIR GROUP EOOD (2016 to the present), Varna.

Since September 2014, Denitsa Dimitrova has been a practical training instructor at the Medical College of the Prof. Dr. Paraskev Stoyanov Medical University – Varna. She supervises the practical training of students in the Medical Cosmetics programme.

The doctoral candidate's continuing practical work is a defining and valuable resource for both her teaching and her research interests.

Developing students' professional competencies through standard exercises and case-based learning tasks grounded in practical experience is central to her work with future medical cosmetics professionals.

Denitsa Dimitrova is a member of the Association of Medical Cosmeticians.

The doctoral candidate is responsible for administrative and financial management in research project No. 24033, Knowledge, Attitudes and Practices Related to Antimicrobial Resistance in Dermatological Care, funded by the Science Fund of Medical University – Varna under the autumn 2024 call for proposals. Project period: 01.01.2025–31.12.2027. She has completed postgraduate professional development courses.

She has a good language skills of English and Russian.

Denitsa Dimitrova has active registered research profiles on Google Scholar and ORCID.

Lecturer Dimitrova's longstanding involvement in professional practice and her particular interest in competencies related to dermatological care were decisive in her choice of dissertation topic.

2. General Characteristics and Relevance of the Dissertation

Relevance of the Topic

The topic proposed by Denitsa Dimitrova is highly relevant. Examining young people with acne and their awareness of antimicrobial use and self-medication is of considerable importance to public health. Of even greater significance are medical cosmeticians' knowledge, attitudes and professional practices regarding infection control, as antimicrobial resistance is becoming one of the most serious global public health challenges of the twenty-first century.

It is well established that antimicrobial resistance (AMR) is the ability of microorganisms to survive or grow in the presence of an antimicrobial agent that would normally inhibit or kill them. Self-medication and underestimation of the problem make AMR a serious threat in the years ahead. Its principal consequences include deaths and increased costs to health systems, as evidenced by European Commission data projecting 39 million deaths as a direct result of bacterial AMR between 2025 and 2050.

The link between AMR, skin diseases and self-medication with antibiotics is indisputable. Acne vulgaris, which is characteristic of young people, occupies a prominent place among skin diseases because of its high prevalence, chronic course and frequent treatment with prolonged antibiotic regimens.

Cosmetic practice, including the work of medical cosmeticians, plays a significant role in preventing AMR. The relationship between antimicrobial resistance (AMR) and medical cosmeticians is becoming increasingly critical, as these professionals work with the skin barrier and apply topical antimicrobial products on a daily basis. Cosmetic procedures often involve close contact with the skin and the use of reusable instruments. Procedures that breach the skin barrier are common and require the use of disinfectants and antiseptic agents. Appropriate skin treatment and adherence to hygiene requirements are core competencies of medical cosmeticians in preventing AMR.

Despite the growing scale of the problem worldwide, the lack of research in Bulgaria presents a serious challenge for medical cosmeticians. The expanding range of cosmetic services offered to young people should heighten professionals' sense of responsibility, both when performing procedures and when raising awareness among adolescents and their parents of the consequences of self-medication. Numerous studies demonstrate high levels of antibiotic use, insufficient awareness of how antibiotics work and substantial challenges to their rational use, all of which medical cosmeticians can help address.

The demonstrable importance of the problem calls for further research in this field and the exploration of alternative ways to improve cosmetic practice in relation to AMR prevention.

Structure of the Dissertation

The submitted dissertation follows the conventional structure of three chapters: Chapter 1 – Literature Review; Chapter 2 – Research Methodology and Organisation; and Chapter 3 – Results and Discussion, followed by conclusions, recommendations and contributions. It comprises a total of 165 standard pages and is illustrated with 26 figures, 8 tables and 2 appendices. The dissertation submitted for review includes an extensive, comprehensive and accurately compiled bibliography containing 188 references, of which 12 are in Cyrillic script and 176 in Latin script.

3. Assessment of the Structural Components of the Dissertation

Literature Review and Knowledge of the Research Problem

Denitsa Dimitrova is familiar with the current state of the research problem and provides an insightful appraisal of the available literature through in-depth analysis. **In the literature review**, the doctoral candidate demonstrates competence in addressing AMR as a global problem and the initiatives intended to tackle it. She places particular emphasis on acne vulgaris as a significant contributor to the growing threat, as well as on the effectiveness of infection control in beauty salons in Bulgaria.

The review is logically structured into three main parts. The first two contain subsections, while the third presents the conclusions drawn from the literature review.

The first part of the review focuses on antimicrobial resistance at the global and national

levels. The relevance of the problem is further underscored by the position of the World Health Organization (WHO), which formally recognises AMR as a global priority and a leading threat to human health in the twenty-first century. WHO emphasises that antibiotic resistance already ranks among the leading indirect causes of death worldwide, alongside cardiovascular diseases. European Union initiatives addressing the problem are also discussed, namely the annual observance of European Antibiotic Awareness Day (18 November) and World AMR Awareness Week, accompanied by campaigns promoting the responsible use of antibiotics. At the national level, there is a marked lack of public awareness regarding self-medication with antibiotics for skin diseases. Particularly striking is the finding of a 2022 Eurobarometer survey that Bulgarians are among the least informed people in the EU about the limitations of antibiotics. These findings prompted the researcher to examine AMR-related knowledge, attitudes and practices in the context of skin health, also considering infection control in cosmetic practice.

The second part of the literature review examines the relationship between AMR and skin diseases, particularly acne vulgaris, as well as cross-infection and AMR in beauty salons. It concludes that AMR is an important issue in skin care because of the inflammatory nature of the most common skin diseases and the broad range of skin care services offered, which may facilitate cross-infection where infection control is ineffective.

The review is written in a sound academic style. At 56 pages, its length is well proportioned to the dissertation as a whole. The sources used are cited fully and accurately, and most were published within the last decade.

Research Methodology

The main **aim** of the dissertation is to investigate and analyse two aspects of the relationship between AMR and the work of cosmeticians: young people's knowledge, attitudes and behaviour regarding self-medication with antibiotics for acne, and medical cosmeticians' knowledge, attitudes and behaviour regarding infection control and AMR prevention in dermatological care.

Five logically and appropriately formulated research objectives have been set to achieve this aim.

Six working hypotheses have been defined, all relevant to the aim and objectives of the research.

The research is a comprehensive medico-social study incorporating a systematic review of regulatory documents and publications to compare the relevant national regulatory framework with international regulations.

Two descriptive cross-sectional studies were conducted, as follows:

- a study of knowledge, attitudes, frequency and patterns of self-medication with antibiotics among young people with acne in Bulgaria, and their awareness of AMR;
- a study of professional medical cosmeticians' knowledge, attitudes and practices regarding infection prevention and control in their daily practice.

The two quantitative studies included a total of 490 participants: 234 young people aged 18 to 35 years and 256 practising cosmeticians in Bulgaria.

Participants in the **first study** were recruited through an online survey of students

from various degree programmes at 13 higher education institutions in Bulgaria: Medical University – Varna; Sofia University 'St. Kliment Ohridski'; Varna Free University 'Chernorizets Hrabar'; Plovdiv University 'Paisii Hilendarski'; Agricultural University – Plovdiv; Trakia University – Stara Zagora; Medical University – Pleven; the University of Architecture, Civil Engineering and Geodesy – Sofia; Technical University – Sofia; New Bulgarian University; the University of Chemical Technology and Metallurgy – Sofia; and the University of Ruse 'Angel Kanchev'.

The questionnaire is an original instrument developed for the study on the basis of a thorough review of the scientific literature. It includes 58 questions organised into 6 information domains: physical and psycho-emotional health and psychosocial factors (10 questions); lifestyle and dietary habits (4 questions); tobacco, psychoactive substance and alcohol use (8 questions); skin characteristics and acne profile (8 questions); knowledge, attitudes and practices regarding acne and its treatment (20 questions); and sociodemographic characteristics and socioeconomic context (8 questions).

The study was conducted between September and November 2025.

The second study included 256 practising cosmeticians from across Bulgaria, listed in the official registers of facilities of public significance maintained by the country's 28 Regional Health Inspectorates, which operate under the Ministry of Health.

The questionnaire was designed specifically for the study and contains 45 questions divided into 6 thematic sections: awareness of infection control and cross-infection prevention in beauty salons (7 questions); infection control practices (12 questions); attitudes towards infection control (4 questions); knowledge and awareness of antimicrobial resistance (4 questions); attitudes and practices related to AMR, antimicrobial products and professional collaboration (11 questions); and participants' sociodemographic and professional characteristics (7 questions).

The questionnaire was distributed online via Google Forms. Participants came from different geographical regions of Bulgaria, giving the sample broad geographical coverage.

The study was conducted between June and August 2025.

The studies received approval from the Research Ethics Committee of Medical University – Varna (Protocol No. 12/27.03.2025).

The selected research methodology enables the stated aim to be achieved and the objectives addressed in the dissertation to be fulfilled appropriately.

The *methodology* meets the requirements for rigorous scientific research drawing on a broad range of sources. It demonstrates the author's in-depth knowledge of contemporary methodological approaches in medico-social research. Appropriate research *methods* have been selected, and their precise application is described in detail.

The *results* are presented clearly, are well structured, and follow a logical sequence corresponding to the five research objectives. Although an integrated approach to infection prevention and control in cosmetic practice, based on the six components of the standard precautions recommended by WHO, is applied internationally, the study demonstrates that the requirements currently governing cosmetic practice in Bulgaria do not conform to international guidelines.

The high proportion of young people with acne identified in Bulgaria (62%) is

consistent with the high percentage of those who practise self-medication (61.3%). It is concerning that 60.6% of participants downplay their skin condition, while almost 20% of antibiotic users determine their own dosage.

The study establishes the need for, and importance of, further training in the application of standard precautions for infection control in cosmetic practice, as well as in antibiotic literacy and behavioural patterns among young people.

A particularly valuable aspect of the dissertation is its finding concerning the application of an integrated approach to antimicrobial resistance, combining the rational use of antibiotics, effective infection control, and improved health literacy within the Bulgarian community. ***To develop this idea further, the organisation and implementation of a pilot project are recommended once consensus has been reached among the institutions concerned.***

The dissertation's 11 conclusions are drawn from the main components of the study—the theoretical component and the quantitative surveys—and are relevant to the stated research objectives.

Overall assessment of the dissertation and its contributions.

I fully endorse the **theoretical and practical contributions** identified by the doctoral candidate. The dissertation provides an in-depth investigation of the topical issue of antimicrobial resistance in dermatological care. Lecturer Denitsa Dimitrova has critically analysed the available literature on the subject, including the regulatory framework of the Republic of Bulgaria. The nature and significance of antimicrobial resistance and acne vulgaris are examined in detail.

In conducting the study, the doctoral candidate demonstrates research skills, the ability to work in a team, and ethical conduct in her interactions with all study participants. Her competence in conducting a study of such broad scope deserves commendation.

The dissertation offers new and interesting information on a topical public health issue, providing a basis for several overarching conclusions. These primarily concern changes in public attitudes towards antibiotic literacy and patterns of self-medication among young people, as well as gaps in professional cosmeticians' knowledge, attitudes, and practices relating to infection control and antimicrobial resistance.

The present study focuses on the theoretical and practical foundations through which contemporary opportunities for optimising health care management in dermatological care can be identified. The dissertation substantiates the idea of an integrated approach to antimicrobial resistance within the Bulgarian community, informed by the views of young people and of practising medical cosmeticians as experts in dermatological care. The recommendations arising from the dissertation envisage the further development of this idea by broadening the scope of the study and combining the efforts of the institutions concerned to address antimicrobial resistance as a major problem in contemporary society.

The dissertation abstract accurately reflects the structure of the dissertation and presents the study's most significant findings and conclusions.

Two publications relating to the dissertation were included in the proceedings of scientific events held between 2023 and 2026, with the doctoral candidate as first author in both. The doctoral candidate also has 19 publications on topics outside the scope of the dissertation, published between 2016 and 2026.

CONCLUSION

The dissertation submitted is distinguished by its relevance, originality, methodological innovation, and precision. The overall organisation and conduct of the study are the doctoral candidate's own work and demonstrate her strong research capabilities.

The dissertation ***contains scientific, applied research, and practical findings that constitute an original contribution to knowledge*** and **meet** the requirements of the Act on the Development of Academic Staff in the Republic of Bulgaria, the Regulations for its implementation, and the Regulations of Medical University – Varna. The materials submitted and the dissertation findings **fully** meet the specific requirements adopted under the Regulations of Medical University – Varna for implementing the Act on the Development of Academic Staff in the Republic of Bulgaria.

The dissertation demonstrates that the doctoral candidate, Denitsa Ivanova Dimitrova, **possesses** in-depth theoretical knowledge and professional skills in the scientific specialty of Public Health Management, and **shows** the qualities and skills required to conduct independent scientific research.

In view of the above, I confidently give a ***positive assessment*** of the research presented in the dissertation and dissertation abstract reviewed above, and of the findings and contributions achieved, and ***recommend that the esteemed members of the Scientific Jury award Denitsa Ivanova Dimitrova the educational and scientific degree of Doctor (PhD) in the scientific specialty of Public Health Management.***

30.10.2026 Reviewer:..

Заличено на основание чл. 5, §1, б. „В“ от Регламент (ЕС) 2016/679

(Prof. M. Draganova, PhD)