

Formation of Professional Readiness of the Future Healthcare Specialist

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Abstract: The article substantiates the content and develops a model of professional training of assistant dentist, as well as his educational and qualification characteristics and educational and professional program and, through experiment, introduced the training of such a specialist in seven higher medical schools in Ukraine. Theoretical concretization and experimental testing of organizational and pedagogical conditions of professional training of junior specialists of dental profile in the line of general requirements of the personal approach to the organization of process of professional training are carried out. Factor analysis of trends in the development of education and environmental systems and analysis of the experience of professional training of auxiliary specialists in the field of dentistry abroad revealed the conditionality and necessity of professional training in Ukraine for junior dentists. The organizational and pedagogical conditions that will ensure the effectiveness of professional training of a dental assistant in a higher medical educational institution, namely: the system of three-subject interaction of the educational institution, the student as a future specialist and potential employer and pedagogical opportunities for self-realization of the student as a subobject of his/her own professional training. Through the experiment, the effectiveness of the introduction of organizational and pedagogical conditions for the professional training of an assistant dentist was proved. During the study, the experimental group eventually rethought the “object” of its activities and crossed the previously opaque boundaries between medical care and student supervision for the benefit of all parties.

Keywords: *professional training, organizational and pedagogical conditions, junior specialist of dental profile, three-subject interaction, specialist's portfolio, basic model.*

How to cite: Humeniuk, O., Humeniuk, V., Yefremova, O., Vasyuk, O., Yashchuk, S., & Nahorna, N. (2021). Formation of Professional Readiness of the Future Healthcare Specialist. *Revista Romaneasca pentru Educatie Multidimensionala*, 13(1Sup1), 416-438. <https://doi.org/10.18662/rrem/13.1Sup1/404>

1. Introduction

The authors believe that new socio-economic conditions put one of the first places in pedagogical research on improving the content and process of training, development of its models, the introduction of new specialties that await the labor market. In particular, in the field of dental care, there is a need for well-trained dental support staff who, in countries with a high level of dental health, work as part of a dental team in a time-consuming technology environment.

We are confident that modern technologies of dental care require highly qualified specialists with special education. Professional training of dental assistants would improve the quality of dental care and increase the productivity of the dentist.

2. Analysis of recent research and publications

In Ukraine, insufficient attention was paid to the professional training of junior dental specialists. Given the urgency of this problem, the demand of the modern labor market for junior dentists (assistant dentists) is quite high, and the lack of special research in this area creates a solid need to study this topic.

In the works by Bennett et al. (2020) the basic curriculum in biological and biomedical sciences for dentistry is revealed. Camp (1996) argues that problem-based learning is a paradigm for changing the transition curriculum. Chou et al. (2020) show in their theories the influence of the programs of the VII dental working version on the practice of dentists by analyzing the similarities and differences.

The article by Szabó, Davis, and Antal (2020) substantiates the importance of developing communication skills among future dentists. Costa et al. (2020) evaluate the behavior of dentists regarding the use of subjective characteristics of patients. Devillard (2018) substantiates the self-assessment of educational needs of junior associate professors in conservative dentistry and endodontics in France.

The research of Dsouza et al. (2019) devoted to the coverage of oral health in the education of nurses through interprofessional practice of joint work “Qualified experimental research project”. Friedlander, Meldrum, and Lyons (2019) contribute to the development of training programs in dentistry of the last courses to increase competence and professionalism for modern general dental practice. Fu et al. (2020) reported satisfaction with the lives of Taiwanese dental graduates who received residency in the United States. Höhne, Schwarzbauer, and Schmitter (2020) implemented a new educational concept of

crown preparation with 3D-printed teeth. Imorde et al. (2020) conducted a pilot study on the adaptation and validation of the Berlin Questionnaire of Evidence-Based Dentistry for dental students. Isherwood et al. (2020) provide teaching of orthodontic emergencies using the method of "inverted class" - mixed methods of RCT. Kirnbauer and Ali (2020) compared the state of harmonization of dental education twenty years after the launch of the Bologna Process. Koch et al. (2014) made successful clinical and organizational changes in endodontic practice. The article by Ross and Baker (2019) describes the result of studying the experience of the founding dentists during the year of their dental training. O'Keefe et al. (2014) proposed a rethinking of attitudes towards student clinical supervision and patient care. Wee et al. (2016) disclosed the evaluation of a web-based training module on screening for oral cancer based on a behavioral system. Based on the above works, an industry standard of higher education was developed for a junior specialist - assistant dentist, which formed the basis of our experimental program of change in dental practice.

Kérourédan et al. (2018) argue that academic teachers of the dental profile are very significant in the training of future dentists. Therefore, their experience and knowledge are crucial to ensure effective learning. However, a French national seminar found that most young researchers lacked preventive prevention skills at the beginning of their careers in maintaining their own health, organizing their own professional and leisure activities.

The aim of the research is experimental diagnostics of organizational and pedagogical conditions of formation professional readiness of an assistant dentist.

The hypothesis of the study is based on the assumption that the professional training of a dental assistant will be effective, provided substantiation of theoretical and methodological principles of the content and model of professional training of junior specialists, consistent with the demands of the labor market and modern world standards of the profession.

3. Research methods

According to the goal, we adapted the Berlin Questionnaire (BQ) for dental students, which assesses their medical abilities based on their assessment results (Devillard, 2018). The Berlin questionnaire method was approved by medical residents of Germany. We adapted it for use in dentistry. The panel reviewed the adapted BQ for content validity. A cross-sectional cohort representing four levels of study (beginning EbD dentistry students, EbD dental students, and EbM / EbD dentists) completed the questionnaire. The internal reliability, complexity of the subject and

discrimination of the subjects were assessed. The validity of the design was assessed by comparing the average total scores of students with teachers and comparing the proportions of students and teachers who passed each subject. According to the results of 872 participants (EbD-novice dentists, EbD-students majoring in “Dentistry” and EbM- / EbD-expert faculty) there was a difference, statistically significant ($p < 0.001$), in the total score to the level of training. The general assessment of the reliability and psychometric properties of the items, modified according to the discipline, were acceptable.

2. Methodology «Motivation to choose a medical profession» by Vasilkova (1998);

3. Test «Professional situations»;

4. Author's method of three-subject questionnaire.

3.1. Theoretical foundations of the research

A set of research methods was used to reveal the purpose and substantiate the hypothesis. *Theoretical methods*: analysis of philosophical, pedagogical, psychological and medical sources on the research problem; synthesis of characteristic and essential features of the systems of professional training of a dental assistant in Ukraine and abroad to determine trends in the market of dental services in Ukraine and higher dental education.

Empirical methods: Berlin Questionnaire (BQ). Respondents were asked 3 categories of questions: the quality of sleep, the presence of breath shortness and blood pressure. Then, for each set of positive or negative responses, each specific category was evaluated. With a positive value of two or more categories concluded that there was a high probability of this patient's OSAS. Obstructive signs (apnea, hypopnea, awakenings connected with shortness of breath) which promote development of such symptoms are considered as criteria of OSAS which promote development of such symptoms: casual episodes of falling asleep, day drowsiness, lack of a night's sleep, fatigue, shortness of breath, loud snoring, respiratory arrest, etc. Everything mentioned above creates an objective picture of the inner well-being and exhaustion of the subjects as indicators of productive activity and readiness to perform professional duties (Devillard, R., 2018).

Methodology “Motivation to choose a medical profession” by Vasilkova (1998), in which the author highlights the presence of motives for choosing a medical profession: the desire to treat people, the desire to alleviate the suffering of seriously ill people, the ability to care for the health of loved ones, the ability to influence other people, material interest, availability of medicines. The

relationship between personal characteristics and performance is mediated by such socio-psychological factors as the position of the individual in the team, the degree of compliance of his/her interests with the interests of the team members.

Test "Professional Situations" measures the following 4 types of managerial positions, inclinations, or orientations:

D – focus on the interests of the case;

P – focus on relationships with people, the psychological climate in the team;

O – focus on official subordination;

Z – self-orientation.

Author's method of three-subject questionnaire presents the author's justification and psychodiagnostics of the components of three-subject interaction in the model of professional training of dentists, using the criteria: Student's t-test (to check the significance of indicators); «<0» (correlation confirmation of the significance of the effects of the studied phenomena); «n» (quantitative indicator of observations); «G0.05» (assessment of the reliability of the shift on the significance of 0.05); «G0.01» (assessment of the reliability of the shift on the significance of 0.01); E-11 cut (to determine the significance of a feature). With the help of the author's psychodiagnostic questionnaire by using quantitative and qualitative evaluation criteria, individuals from control and experimental groups were selected. The composition of the experimental sample qualitatively and quantitatively represents the general population, as modeling and randomization techniques were used for its formation. The used experimental plan, methods of statistical processing, its carrying out and interpretation of the results provided internal and external validity.

Pedagogical experiment was carried in order to verify the effectiveness of organizational and pedagogical conditions of junior specialists in dentistry professional training and testing the system of professional training of an assistant dentist, in accordance with the theoretically defined conditions. The experiment used different methods of pedagogical research, namely: observation (the subject of observations was the learning activities of students in the classroom); conversation (conducted with students in the process of analyzing the results of the survey); content analysis as a method of studying documentation (studying information from class journals, the results of tests and trials).

Mathematical methods – for analysis and interpretation of experimental results.

The study was conducted on the basis of Lviv State Medical College named after Andrey Krupinsky, Rokytno Medical School of Rivne region, Zhytomyr Basic Medical College, Mohyliv-Podilsky Medical School of Vinnytsia region, Kharkiv Medical School № 2, Higher Educational Institution “Institute of Ecology and Medicine” (Kyiv), Ukrainian Medical Dental Academy (Poltava). The experimental study involved 563 people, including 388 students, 90 teachers, 63 managers on the basis of practice, 22 heads of dental clinics, taking into account their professional experience: at the beginning of training, in the process of training and practices (clinical management). During the experiment, the attitude of dentists to practice was studied in order to increase the level of readiness of junior specialists – dental assistants. The sample of subjects was a category of persons aged 17 – 21 years, specialty 221 Dentistry, specialization "Dentistry" by educational qualification level – junior specialist. The experimental group (EG) included 201 students, and the control group (CG) included 187 students. All participants were informed about the conditions of the experiment and gave voluntary consent to participate in the study. The experiment was conducted by the decision of the Lviv Medical Academy named after Andrei Krupinsky at the Department of Surgical Disciplines and Emergencies (Minutes № 17 from 29.09.2017). The participants gave their informed consent for participating in the study (were informed of the withdrawing possibility, with no other consequences on their status etc.)

The prerogative of this sample is that all groups are related to the dental profile, in the formation of which experimental diagnosis of organizational and pedagogical conditions of professional readiness of the assistant dentist is quite important.

The theoretical and methodological basis of the study is also based on the principles of objectivity and scientificity, systematic and integrated approaches. Objectivity in covering the topic was to make objective, non-opportunistic conclusions, based on the views of previous researchers, and reliable, verified information from selected sources. At the same time, we did not avoid critical judgments and assessments to realistically show a number of psychosomatic problems in terms of the formation of the future assistant dentist professional readiness.

The educational process opens wide prospects in the direction of forming the worldview of a young person. In this regard, the problem of psychophysical health as a component of training in the context of the worldview of future professionals in the educational process of free economic education, each year acquires special significance due to the constant deterioration of youth health due to unfavorable socio-economic conditions in many countries. and, in particular, in Ukraine. The history of human society

shows that in the case of new, stronger sources of energy and technology, the role of human motor qualities is undoubtedly reduced, while the importance of mental functions is constantly increasing. Scientists claim that the restriction of motor activity, which develops as a result of scientific and technological progress, is, first of all, directly related to human psychophysical health.

According to the general scientific methodology of system and activity approaches, we define the concept of «*system of professional training of dental assistant*» as an artificial system, open, dynamic, abstract as a pedagogical concept and specific as a pedagogical phenomenon, summative and activity. Focusing on this system is appropriate given the needs of its actors and relationships with other systems. The presence of structural elements of the system is specified on the basis of the proposed changes in their properties and new elements of interaction. It is concluded that such elements are adaptability with a focus on self-development and compatibility with tangential systems. The modern educational system as active, non-linear, capable of self-organization, is open to transformations, quantitative and qualitative changes. Thus, it is not only determined in tangent systems, but also causes changes in them.

The analysis of the system of professional training of dental assistant and dental hygienist in European countries made it possible to identify a wide range of basic training programs for dental assistant and qualification levels for dental hygienist training – junior specialist (licensee) – bachelor – master. There are specializations (for example, medical educator, biocommunicator, researcher in the field of dental hygiene) within the framework of foreign professional training of a dental assistant or dental hygienist. There is a tendency in certain regions to determine the bachelor's degree of dental hygienist training as the minimum level for this profession (O'Keefe et al., 2014).

The practice of social partnership characteristic of the world space is revealed. Various stakeholders are involved in planning and forecasting educational change: from national dental associations to clinic managers; students as future specialists; representatives of professional associations; representatives of public associations, foundations, organizations; individuals and legal entities, as reflected in the Bologna Declaration.

According to *the first stage of the research*, the content is theoretically substantiated and a model (Fig. 1) of professional training of a dental assistant is developed; theoretically substantiated and implemented organizational and pedagogical conditions of three-subject interaction of the institution, student as a future specialist and potential employer through appropriate management and pedagogical actions that provide a system of implementation of these conditions

through the activities of all three subjects of training; the necessary methodical support of professional training of the specialist is developed.

The methodological basis of the conceptual model of training a dental assistant is a systematic approach. The proposed model is a functional system, interconnected by goals, objectives, place and time, content, forms and methods. These components are aimed at forming in students a level of theoretical knowledge and practical skills and abilities in accordance with state standards and qualification requirements for graduates, which ensure their further functioning in the field of health care.

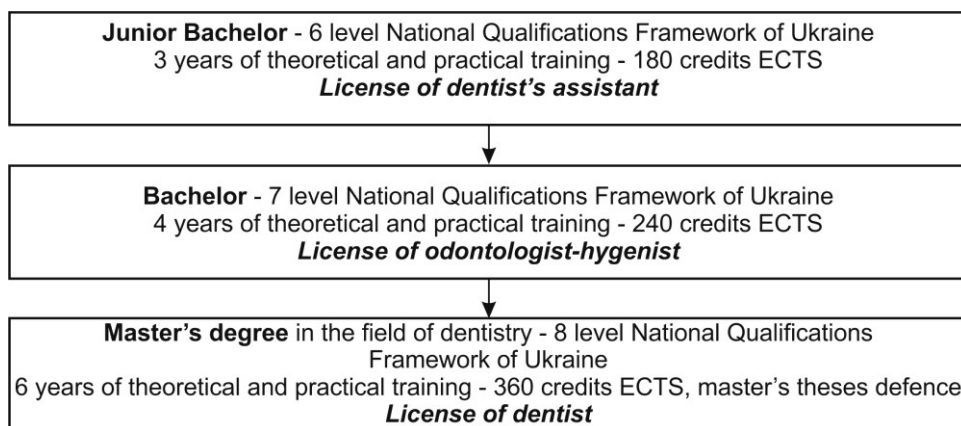


Fig. 1. Model of dentists' professional training

The basic principles of the organization and functioning of the system of training a dental assistant are as following:

1. Scientific substantiation and support of educational process in all elements and links of organizational structure of the higher professional education which are carrying out preparation of medical specialists.
2. Comprehensive support of the educational process.
3. Rational use of study time, financial, material and technical resources.

The goals of the organization of the educational process within the proposed model are:

- formation of a socially adapted, professionally competent, cultural personality of a doctor with modern theoretical knowledge;
- formation of students' creative activity, ability to work in a research mode, the ability to continuous self-education;
- intensification and radical improvement of the organization and content of training of future doctors.

Methodical bases of the organization of educational process on a specialty are defined by set of requirements to which it is possible to carry:

- requirements related to professional activity in the context of informatization of modern society;
- requirements for scientific and technical development;
- society's requirements for the quality of health care reform and the requirements of legal documents governing the modern doctors' training.

Having found out that the basic components of the model (assistant dentist) in their combination can be best adapted to the needs of the Ukrainian market of dental services, we provided a synthesis of these two areas of professional action and for the first time developed the production functions of such a specialist corresponding to his/her labor structure, features of the potential sphere of activity.

The model of professional training of an assistant dentist is substantiated and developed. It takes into account the indirect and direct subjective influences of the educational and professional environment on the process of professional training of the specialist (subject) and is detailed by us in the following components: the system of personal relations and priorities of the student in the profession; knowledge, skills and abilities of the future specialist; production functions; experience of creative activity aimed at the professional channel.

In accordance with the requirements of the personal approach, it is determined that the model of professional readiness of the future specialist (basic model) is built by the student as a system of personal parameters of professional readiness (motivational, orientational, operational, volitional and evaluative) and implemented by the educational institution personality of a professional by predetermined qualities.

In the process of professional training of the assistant dentist the following *organizational and pedagogical conditions* are allocated:

- 1) creation by the educational institution of a system of three-subject interaction with the student as a future specialist and potential employer, which is open, permanent, practically oriented;
- 2) organization of the educational process as a subject-subject, where the active activity of students is directed in a professional direction;
- 3) ensuring the content and regulatory framework and organizational capabilities of its development in the process of interaction of subjects;
- 4) the use of adaptive and interactive management technologies, which contributes to changes in the content of training in accordance with the demands of the labor market;

5) providing opportunities for students and potential employers to influence the didactic process through the environment and mechanisms of management interaction;

6) the use of special interactive teaching methods through the performance of individual learning tasks by students.

3.2. Methods of a pedagogical experiment conduction

The study was conducted during 2017 – 2020 and included two stages of scientific and pedagogical research:

At the first stage (2017 – 2018) the content of organizational and pedagogical conditions of professional training of an assistant dentist was theoretically substantiated and developed for the first time in Ukraine. A model of his professional training has been developed and specialist training has been started. The branch standard of higher education of the junior specialist – the assistant to the dentist and the corresponding educational and methodical maintenance is developed, with taking into account the legislative achievements of federal care for medical professions engaged in the training of primary care medicine and dentistry in the United States (Reynolds, 2008).

At the second stage (2019 – 2020) the results of the formative experiment were summed up, the educational and methodological support of the professional training of the assistant dentist was improved and the efficiency was checked by the method of selective observation. At the international level during the implementation of training and practical seminars of the cycle «Implementation of international protocols in dental practice», carried out experimental work to verify the effectiveness of organizational and pedagogical conditions of professional training of dental assistant was conducted during 2019 – 2020. The general population was formed on the basis of seven higher medical schools in Ukraine (872 people): Lviv State Medical College named after Andrey Krupinsky, Zhytomyr Basic Medical College, Rokytne Medical School of Rivne Region, Mohyliv-Podilsky Medical School of Vinnytsia Region, Kharkiv Medical School № 2, Ukrainian Medical Dental Academy (Poltava), Higher Educational Institution «Institute of Ecology and Medicine». Kiev). The representativeness of the sample was ensured on the basis of generalization of a series of observations conducted at the Lviv State Medical College named after Andrey Krupinsky; Mohyliv-Podilskyi and Rokytne medical schools, in the specialty 221 "Dentistry" in the field of knowledge 22 "Health" for the second (master's) level of higher education, attached.

At each stage of the experiment, the parameters of professional readiness (psychophysiological and educational (three-subject)) as an integrative personal quality (after the first production practice and after the

last – undergraduate practice) were measured twice for students of experimental and control groups. The total number of control sections is four.

The activity of the subjects-organizers of the process of professional training of the assistant dentist is represented by three subjects. *The first subject* is a higher education institution – a representative of the educational structure of society. *The second subject* is the student himself as a future specialist – a direct consumer of educational services. *The third entity* is the health service as a potential employer and indirect consumer of educational services, as well as representatives of professional dental unions.

To diagnose the professional readiness of students, a multifactorial experimental study was conducted with simultaneous variation of all factors, which according to the research hypothesis confirm the effectiveness of the implemented factors. For their measurement in the course of experiment were used: a technique “Motivation of a choice of a medical profession” by Vasilkova (1998) – to determine the degree of predominance of groups of internal and external motives; modified by us in accordance with the nature of the profession test “Professional situations” (Kirnbauer, & Ali, 2020) – to identify the orientation of the individual in professional activities; *author's method of three-subject questionnaire* – to compare the three-subject vision of the level of professional readiness of the specialist and three-subject assessment of the operational parameter; subject control test – to determine the characteristics of the manifestation of the volitional parameter of professional readiness and to identify the level of subjective control of students in personally professionally significant situations. The structure of the questionnaire included 15 scales, which we provided the appropriate interpretation to determine the indicators of three-subject interaction and basic parameters (motivational, orientation, operational, volitional, evaluation). The results of the experiment were processed using the methods of mathematical statistics, through a computer implementation in the Excel-2002 format. Statistical significance was determined using Student's t-test by detecting correlations by Spearman's linear correlation coefficient, according to which the following parameters were identified.

Motivational parameter. The initial motivational indicators of students of the experimental and control groups were quite close with the same predominance of internal motives, focused on the content and nature of medical activities and external narrowly personal motives. Instead, the external social motives for choosing a medical profession turned out to be less significant. By the time of graduation, the experimental group found statistically significant shifts in seven motivational indicators out of nine.

Motivation for the choice of medical profession by students of the experimental group increased in terms of internal motives («Desire to treat people», «Desire to alleviate the patients' suffering», «Desire to solve medical problems»); external social motives («Prestige of the profession») and decreased indicators of narrowly personal motivation («Access to medicines», «Desire to take care of his/her own health»). Instead, control students found statistically significant shifts for only two of the nine.

Orientation parameter. The orientation of the students' of experimental and control groups behavior in professional activities was determined through four types of orientations: self; for official subordination; on the psychological climate and relationships; to the point. The results show the closeness of the indicators of the orientation parameter of the experimental and control groups in the first section after the first production practice and significant deviations between the group indicators in the second section after undergraduate practice. The experimental group, according to the results of the second section, found a statistically significant decrease in the focus on official subordination and the external side of professional relationships. Subjective expectations (according to the conditions of the experiment) significantly influenced the increase in self-orientation and business orientation (the alternative hypothesis is correct).

Operating parameter. The evaluation of the operational parameter of professional readiness was carried out according to the author's method of three-subject questionnaire. The first section revealed significant differences in the three-subject assessment of professional knowledge, skills and abilities of students of experimental and control groups after the first internship. The qualitative level of skills and abilities of students, determined by the first subject, was much lower than that obtained by surveying the second (students themselves) and third (potential employer) subjects.

Volitional parameter. The measurement revealed an experimental volitional result in professional activities, which were carried out twice – after the first production and previous practical work. At the first levels, no statistically significant differences were presented between the control and experimental groups of the group for any of the surveyed individuals (null hypotheses). Comparisons of other experiments with experimental and control groups confirm alternative hypotheses for all analyzed demonstrations. The studied experimental groups revealed the highest level of general interior life, succumbing to the most important cases of situations that exist and failures. The current display of «subjective control over production situations», with the help of experimental groups, was the level of 5 583 units, students of the control group – 4.6 units (t-criterion of use 4.73, with t-critical level 1.98).

Evaluation parameter of the professional readiness was carried out based on the results of the assessment of professional readiness by three subjects after the students passed the internship based on the results of relevant knowledge and skills. The first section revealed significant differences in the quality of assessment indicators by students, the base of practice and the educational institution of knowledge, skills and abilities. The indicators obtained by us in the second section of the evaluation parameter allow to identify not only the qualitative dynamics and advantage of the experimental group compared to the control, but also the presence of significant convergence of qualitative indicators of the first and second subjects and the existence of clear differences in the control group. Two-sample t-tests with different variances were used to statistically test the correctness of the alternative hypothesis.

In accordance with this system, we have developed an experimental program of management and pedagogical actions and started its implementation as a variable factor of the experiment. The vision of the first and third subjects of the components of the model of the specialist and the model-contour of his professional readiness is generalized (on the basis of interviews, responses; conclusions of competent specialists of dental science and practice). The interactive environment of dialogue, interaction and cooperation of the subjects-organizers of educational changes was created due to the initiation by the educational institution of consultations, meetings, responses, reviews, expert questionnaires, questionnaires-assessments of the course and results of professional training. The joint actions of the three entities resulted in changes in the content and process of professional training. Among them are changes in:

- educational and qualification characteristics (at the request of a potential employer, work with X-ray equipment and work as a manager-registrar was introduced);

- general content of professional training, namely the introduction of new disciplines into the standard curriculum – “Radiography of teeth and jaws” (54 hours), “Fundamentals of pedagogy” (54 hours); increase in the number of hours for professional cycle disciplines (first aid – by 27 hours; dental materials science and tools – by 27 hours; therapeutic dentistry – by 27 hours; prevention of dental diseases – by 135 hours);

- organization of professional training (increase of duration and terms of passing by students of industrial practice for formation of experience of preventive work);

- content of typical training programs (first aid; dental materials science and tools; therapeutic dentistry; prevention of dental diseases).

Thus, the modern Ukrainian training of the future assistant dentist is the most optimal option in the development of educational and professional

programs, taking into account the above parameters. That is why we consider it appropriate to introduce specializations (hygienist of preschool (school) educational institution, therapist, management specialist – medical representative, etc.) and further improvement of a specialist in postgraduate education, which will provide subjective control over professional situations of a narrower range.

4. Results

According to the Berlin Questionnaire (BQ), a high risk of sleep-disordered breathing was found in 59.9% of the subjects. Among men, 61.3% had a high risk of sleep apnea, among women – 59.4%, $p = 0.991$. According to the sleep apnea screening questionnaire, an increase in risk was found in 53.6%, 44.4% men and 56.9% women ($p = 0.071$). Excessive daytime sleepiness on the Epworth drowsiness scale (≥ 11 points) was found in 21.7% of those surveyed. The percentage of women with excessive daytime sleepiness was 23.5%, and men – 16.9%, the difference was statistically insignificant ($p = 0.231$), which indicates a fairly high exhaustion of the participants while performing professional duties.

According to the method “Motivation to choose a medical profession” by Vasilkova (1998), we observe a high correspondence regarding the choice of profession of all groups of subjects.

Table 1. Level of motivational readiness of the future assistant dentist

Level	EG (201 people)				The control group (187 people)			
	Before the experiment		After the experiment		Before the experiment.		After the experiment	
	Number	%	Number	%	Number	%	Number	%
High	48	23.88	78	38.81	45	24.06	62	31.55
Satisfactory	101	50.25	109	54.23	100	53.48	107	57.22
Low	52	25.87	14	6.96	42	22.46	21	11.23

According to its indicators we observe the desire to treat people (IL – 84%), the desire to alleviate the suffering of the seriously ill, the elderly and children (OS – 57.2%) and the willingness to solve scientific and medical problems (NP – 99.8%). Thus, the sample of all dentists is determined by the independent choice of profession and at their own will.

In the second section in the control group there is a tendency of indicator difference between CG and EG (Table 2). According to the results of the *author's method of three-subject questionnaire*, it can be seen that there is a focus in both CG and

EG on cooperation between the scales “Official subordination orientation” and “Self-orientation”. In the EG there are quite high values for the provision of medical care, and in the CG the emphasis is on ensuring their own professional interests.

Table 2. Orientation indicators offsets of experimental and control groups

Groups	Criteria	Business orientation	Relations orientation	Official subordination orientation	Self-orientation
EG	t	6	7	0	15
CG		3	18	16	0
EG	<0	1	3	22	0
CG		7	7	9	26
EG	n	7	10	22	15
CG		10	25	25	26
EG	G0,05	0	1	6	3
CG		1	7	7	8
EG	G0,01	0	0	5	2
CG		0	6	6	6
EG	E-11 cut	28.1	18	31.7	22.2
CG		27.9	17	29.2	25.9
EG	E-12 cut	29.2	25.1	25.1	24.7
CG		26.7	20.4	31.5	21.4

Instead, the experimental group showed statistically significant shifts in the indicators of the three subjects relative to the operational parameter, which are arranged in such a way that the evaluation of the three subjects tend to converge (Table 2).

The results of experimental work testify to the effectiveness of the organizational and pedagogical conditions of professional training developed by us and implemented in the practice of teaching – assistants to the dentist. Based on the analysis of the parameters of professional readiness of the specialist revealed (Table 3):

- statistically significant professionally significant changes in all personal parameters of professional readiness of students of the experimental group and the lack of significant changes in the control group, namely – indicators of motivation to choose a medical profession increased due to increased internal motives and reduced narrow personal motivation;
- increase of self-orientation and business orientation and reduction of the focus on official subordination and the external side of professional relationships;

- growth of indicators of subjective internal control both in production situations, and in situations of successes and failures and as a whole – the general internal control;
- significant differences in the first section of the experiment in the results of three-subject assessment of the level of professional readiness of students of experimental and control groups.
- the second section revealed the convergence of indicators of three-subject assessment of experimental groups professional readiness;
- significant, given the purpose of the experiment, correlating dependences of growth of student orientation: *positively* correlated (0.874) requires calculation of the correlation coefficient with internal motives (0.902) to choose a medical profession, internal control in the production sphere, situations of success and failure; *negatively* correlates (–0.09) with the focus on official subordination. Thus, it is possible to confirm the connection that took place between the development of the student as a future specialist, and as the subjectivity of his/her professional training, which highlights the truth of the research hypothesis.

Table 3. Operational indicators offset of control and experimental groups

Group	Criteria	I subject (educational institution)	II subject (students)	III subject (practice base)
CG	t	7	3	5
EG		10	0	2
CG	<0	10	5	7
EG		1	8	5
CG	n	17	8	12
EG		11	8	7
CG	G0,05	4	1	2
EG		2	1	0
CG	G0,01	3	0	1
EG		1	0	0

Thus, the organizational and pedagogical conditions, we have developed and implemented, ensured the effectiveness of the three-subject interaction system and subjective behavior of students and the increase of the students' professional readiness level in all five parameters.

5. Discussion

The study substantiated the content and developed a model of professional training of a dental assistant, which takes into account the subjective influences of educational and professional environment on the process of professional training (subject) in the following components: system of personal relationships and priorities of the student in the profession; knowledge, skills and abilities of the future specialist; production functions; experience of creative activity aimed at the professional channel. The specialist can hold the following positions: assistant dentist (therapeutic, surgical, orthopedic, periodontal and pediatric profiles); dental hygienist. Accordingly, the content of his professional training (educational and professional program) was determined.

Training and practical seminars of the cycle "Implementation of international protocols in dental practice" were introduced and dentists, pediatric dentists, dentists-surgeons, dentists-orthopedists, dentists-orthodontists were invited to visit them. The performed research made it possible to develop and implement educational and methodological support for the process of professional training of an assistant dentist: indicative curriculum, working curricula; typical curricula from the cycle of general scientific (fundamental) and professionally oriented disciplines; methodical recommendations on practical classes in the discipline "Prevention of dental diseases", methodical instructions on the course "Four hands work on a therapeutic reception" in the subject of "Therapeutic dentistry"; methods of organizing students' independent work of on the educational task "Portfolio of a specialist"; methods of organizing independent work of students to perform their educational task "Portfolio of documents of the association of assistants to the dentist".

The results of the dissertation research can be used on:

- *at the national level* in the course of creating industry standards of professional training (to involve in their development not only leading specialists of relevant services and associations, but also the heads of certain institutions);

- *interdisciplinary level* (to involve in the formation and correction of the content of professional training of future specialists representatives of higher education institutions of different levels of accreditation, academia, competent representatives of professional and public associations);

- *levels of higher education* in the course of the organization of professional training to create conditions for: indirect and direct

involvement for their implementation of representatives of the corresponding branch, heads of bases of practice, potential employers; involvement in the self-initiated activity of the direct consumer of educational services – the student himself/herself, as a subject of professional training;

- *international level* during the implementation of training and practical seminars of the cycle “Implementation of international protocols in dental practice”.

The study does not cover all aspects of this problem. Further research, in our opinion, requires theoretical and methodological principles of creating state standards for the training of assistant dentist and dental hygienist under the bachelor's program in light of the concept of the Bologna process, and thus the appropriate construction of content and training of these specialists.

Conclusions

Thus, summarizing the experience of organizing educational programs for the training of future dental assistant in Europe and comparing it with the practice of training such a specialist in Ukraine, we can say that the direction and objectives of his training, the ratio of professional parameters that determine the readiness of dental hygienists in a team and independent professional activity, formed not in favor of autonomous work. At the same time, the presence of an educational and professional training program that lasts three years, the use of a specialist in the field of private dentistry is a positive result, which was achieved in a relatively short time (2017 – 2020). We consider the introduction of specializations (hygienist of a preschool (school) educational institution, therapist, management specialist – medical representative, etc.) and further improvement of a specialist in the field of postgraduate education to be the most optimal option for the development of educational and professional programs.

It is revealed that the methodological basis of the conceptual model of training a dental assistant is a systematic approach. The proposed model is a functional system, interconnected by goals, objectives, place and time, content, forms and methods. The expediency of adapting this model to the needs of the modern Ukrainian market of dental services is proved, combining the functional responsibilities of these specialists to ensure the synthesis of their training in two areas of professional action (indirect and

direct subjective influences of educational and professional environment on training of a specialist (subject)).

The study substantiated the content and developed a model of professional training of a dental assistant, which takes into account the subjective influences of educational and professional environment on the process of professional training (subject) in the following components: system of personal relationships and priorities of the student in the profession; knowledge, skills and abilities of the future specialist; production functions; experience of creative activity aimed at the professional channel. The specialist can hold the following positions: assistant dentist (therapeutic, surgical, orthopedic, periodontal and pediatric profiles); dental hygienist. Accordingly, the content of his professional training (educational and professional program) was determined.

Taking into account the requirements of modern Ukrainian and international educational standards of higher professional education, the content of professional training of this specialist includes knowledge of the basics of professional activity in the field of “human-human”: general communication; special (according to the specialty – prognostic-organizational and managerial-organizational knowledge of the basics of medical management).

Based on the developed model, the industry standard of higher education of a junior specialist in the specialty 5.110106 “Dentistry” was created and the training of an assistant dentist in Ukraine was started in 2019.

In accordance with the requirements of the personal approach, a model-contour of professional readiness of a specialist is defined, which covers motivational, orientational, operational, volitional and evaluation parameters.

The organizational and pedagogical conditions are clarified and determined in accordance with the research methodology, which are the following:

- the educational institution ensures the functioning of the system of three-subject interaction with the student and the potential employer;
- the learning process is organized as a subject-subject;
- there is an appropriate content and regulatory framework for training;
- changes to the content of professional training using adaptive and interactive management technologies were made;

- changes in the organization of the educational process were made;
- interactive teaching methods are used.

In the course of experimental research the efficiency and effectiveness of organizational and pedagogical conditions of professional training of an assistant dentist as a junior specialist in dental profile were tested on the basis of analysis of parameters of his professional readiness: motivational, orientational, operational, volitional and evaluative.

By experimentally implementing the organizational and pedagogical conditions for the training of assistant dentist, a statistically significant increase in the orientation, motivational, operational, evaluative and volitional parameters of professional readiness of future specialists was achieved and a correlation of pedagogically significant indicators was revealed. As a result of the experiment, the indicators of the three-subject assessment of the future specialist professional readiness showed a clear tendency to converge. Mathematical testing of the research hypothesis confirms its correctness.

The performed research made it possible to develop and implement educational and methodological support for the process of professional training of an assistant dentist: indicative curriculum, working curricula; typical curricula from the cycle of general scientific (fundamental) and professionally oriented disciplines; methodical recommendations for practical classes in the discipline “Prevention of dental diseases”, methodical instructions for the course “Work in four hands” at a therapeutic reception in the discipline “Therapeutic dentistry”.

The scientific novelty of the research results is that:

- for the first time at the international level the model of professional training of the junior specialist of a stomatologic profile - the assistant to the dentist is developed and theoretically substantiated; the selection and structuring of the content of professional training of this specialist was carried out;
- further development of theoretical provisions for the management of training of a competitive specialist;
- improved educational and qualification characteristics and content-procedural elements of professional training as a result of interaction of the educational institution, student, potential employer.

Conceptual provisions and recommendations for the training of a junior dental specialist – assistant dentist and substantiated by us organizational and pedagogical conditions that provide higher professional

education, introduced in the Lviv State Medical College. Andrei Krupinsky (reference № 420 of 12.12.2017), Kharkiv Medical School № 2 (act № 339 of 26.11.2018), Higher Educational Institution Institute of Ecology and Medicine (Kyiv) (act №524 from 20.11.2019), Zhytomyr Basic Medical College (reference of the Ministry of Health of Ukraine № 08.02-13 / 2831 from 19.12.2019), Ukrainian Medical Dental Academy (Poltava) (reference of the Ministry of Health of Ukraine № 08.02-13 / 2831 from 19.12.2019), Rokytne Medical School (reference № 256 dated 15.12.2020), Mohyliv-Podilsky Medical School (reference № 348 dated 16.12.2020).

An ethics committee was established on the basis of Vasyl Stus Donetsk National University (Minutes № 34 of September 12, 2017), where the feasibility of the study itself was considered.

The results of the study give reason to believe that the initial hypothesis is correct, and the goal is achieved.

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