

EFFECTIVENESS OF A TRAINING PROGRAM FOR DEVELOPING SOCIO-PSYCHOLOGICAL CHARACTERISTICS IN THE FORMATION OF PROFESSIONAL SKILLS AMONG MEDICAL UNIVERSITY STUDENTS

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ABSTRACT

Given the growing importance of psychological competence in the professional preparation of healthcare specialists, this study evaluated the effectiveness of a training program designed to develop the socio-psychological characteristics underlying the formation of professional skills among medical university students. An experimental study was conducted involving 127 students, divided into an experimental group ($n = 64$), which took part in a six-session training program delivered over two months, and a control group ($n = 63$), which did not receive the intervention. Both groups were assessed twice — before and after the intervention period — using a battery of six psychodiagnostic instruments measuring stress resilience, volitional self-regulation, adaptability, reflexivity, emotional intelligence, and personal maturity. The Wilcoxon signed-rank test showed statistically significant improvements across all six measures in the experimental group ($p = 0.000$), whereas changes in the control group were not statistically significant ($p = 0.060–0.564$). A subsequent frequency analysis of the stress resilience measure showed a pronounced shift in the structure of indicator levels in the experimental group: the proportion of respondents with “resource” (above-average and high) levels of stress resilience rose from 15.63% to 39.06%, while the proportion at “elevated risk” (below-average and low) levels fell from 40.62% to 6.25%; no comparable shift occurred in the control group. These changes reflect a strengthening of psychological readiness for professional activity and the development of stress resilience. The program thus confirmed its practical effectiveness as a targeted means of developing the socio-psychological characteristics needed for medical university students to successfully acquire and apply professional skills.

Keywords: Medicine, Student, Professional skill, Training, Stress resilience.

1. INTRODUCTION

In recent years, interest in studying the socio-psychological factors of students' professional training, including at medical universities, has grown considerably. This creates a need for the wider introduction of modern psychological methods for developing professional skills among medical university students. Effective psychological methods therefore need to be introduced to

address this problem. This, in turn, is of great importance for the formation of professional skills among medical university students.

2. LITERATURE REVIEW

Under conditions of globalization and the ongoing transformation of education systems, particular attention is being paid to the quality of training for healthcare specialists, as reflected in international strategic documents. The World Health Organization's report on the global strategy for health workforce development notes that the formation of sustainable professional competencies is impossible without developing interpersonal communication skills, stress resilience, and the ability to adapt under conditions of high workload (World Health Organization, 2016). In turn, the UNESCO report on education for sustainable development goals states that the education system should be aimed at developing flexible socio-psychological qualities in students, such as responsibility, tolerance for uncertainty, and the ability to work in a team (UNESCO, 2017). In addition, the United Nations' 2030 Agenda for Sustainable Development explicitly emphasizes the connection between the quality of education, health, and well-being, which makes the study of the socio-psychological characteristics underlying the formation of professional skills among medical university students relevant in the context of international standards and recommendations (United Nations, 2015). Increasing stress resilience is of great importance in the formation of professional skills at medical universities (Cherevkova, 2021; Ovcharenko, 2017; Sobirova, 2020).

3. METHODOLOGY

In order to test the effectiveness of the training program developed, we organized and conducted an experimental study involving 127 participants.

3.1 Study Sample

The gender composition of the sample shows a nearly balanced distribution of participants, which is important for correctly assessing the effectiveness of the training program for both sexes. Overall, the study included 127 participants (100%), of whom 51.97% (66 students) were female and 48.03% (61 students) were male, ensuring comparability between groups and reducing the risk of gender bias in interpreting the results of our experimental study.

The age composition of the sample likewise shows a fairly even distribution of participants, making it possible to take into account how the training program's effects vary across age groups. The largest proportion of students belonged to the 18–20 age category — 30.71% (39 students) — reflecting the presence of lower-year students in the sample. The second-largest group was aged 24–26 — 27.56% (35 students) — reflecting students continuing their studies in senior years. This was followed by students aged 21–23 — 22.83% (29 students) — while the smallest proportion, 18.90% (24 students), were aged 27–29. Thus, the overall age structure of the sample ($n = 127$) shows sufficient variability to allow the effectiveness of the training program to be assessed across age groups.

The distribution of the sample by year of study reflects a fairly even spread of students across stages of the educational process, which strengthens the reliability of the comparative analysis of the training program's effectiveness. The largest proportion were first-year students — 21.26% (27 students) — reflecting the active involvement of lower-year students in the training process. Comparable proportions were found among fourth-year students — 17.32% (22 students) — fifth-

year students — 15.75% (20 students) — and third-year students, also 15.75% (20 students). Slightly fewer participants were found among second-year students — 16.54% (21 students) — and sixth-year students — 13.39% (17 students). Thus, the overall distribution of the sample by year of study ($n = 127$) indicates that it is representative and suitable for analyzing the training program's effectiveness across different stages of professional preparation.

Overall, the sample for the experimental study was constructed on the principle of representativeness, meaning that students of different years of study, ages, and sexes were included so that the composition of participants would closely reflect the actual structure of the medical university's student body. To achieve this, purposive sampling with elements of stratification was used: that is, key socio-demographic characteristics (sex, age, year of study) were taken into account when forming the groups, which made it possible to avoid skewing the sample toward any single category. In our view, this approach ensured a balance between lower- and upper-year students, as well as a balanced representation of male and female students, so that the sample reflects a typical picture of the university's student body and allows generalized conclusions to be drawn about the program's effectiveness.

3.2 Training Program and Data Collection

For comparability of the data, the entire sample ($n = 127$) in the experimental study was divided into two groups: an experimental group of 64 respondents, who took part in the training program (that is, the students in this group directly participated in the training), and a control group of 63 respondents, who were not involved in the training program (that is, the students in this group did not participate in the training).

The training itself was conducted over a period of two months, strictly following the program described earlier. Training groups were formed with up to 12 participants each, which made it possible to ensure close interaction between participants and the facilitator and to maintain high engagement among all students. This group size created a safe, trusting atmosphere for practicing skills, receiving prompt feedback, and engaging in reflection, while also allowing exercises to be flexibly adapted to the current level and needs of each subgroup. In addition, the manageable group size made it easier to maintain consistent methodological procedures and conditions across sessions, which increased the comparability and reliability of the data obtained.

The entire empirical study sample ($n = 127$) was assessed before and after the training program using a psychodiagnostic battery comprising six instruments: the Stress Resilience Questionnaire by S. Cohen and G. Williamson; the Volitional Self-Regulation Questionnaire by A.V. Zverkova and E.V. Eidman; the Multilevel Personality Questionnaire “Adaptability” by A.G. Maklakov and S.V. Chermnyanin; the Reflexivity Diagnostic Questionnaire by A.V. Karpov; the Emotional Intelligence Questionnaire by N. Hall; and the Personal Maturity Questionnaire by Yu.Z. Gilbukh.

The Wilcoxon signed-rank test makes it possible to establish the existence of differences adequately and with greater statistical precision, but generally without revealing their specific direction. Accordingly, the next stage of the study was a frequency analysis, making it possible to determine the nature and main direction of change for each indicator studied.

4. RESULTS

The comparative analysis using the Wilcoxon signed-rank test confirmed the existence of substantial, statistically significant changes in the experimental group; however, interpreting the direction of these changes required additional analysis, specifically a frequency analysis, which was accordingly carried out (Table 1).

4.1 Results for the Experimental Group

Table 1. Frequency distribution of stress resilience levels in the experimental group before and after the training program (n = 64)

Level of Development	Pre-Test n	Pre-Test %	Post-Test n	Post-Test %
High	3	4.69	12	18.75
Above average	7	10.94	13	20.31
Average	28	43.75	35	54.69
Below average	17	26.56	3	4.69
Low	9	14.06	1	1.56
Total	64	100.00	64	100.00

Note. Assessed with the Stress Resilience Questionnaire (S. Cohen & G. Williamson).

As Table 1 shows, the Stress Resilience Questionnaire by S. Cohen and G. Williamson revealed a pronounced positive shift in the distribution of levels in the experimental group (n = 64) following the training program. Before the training, results were concentrated at the middle and lower levels: 43.75% of participants (28 students) scored at the average level, 26.56% (17 students) below average, and 14.06% (9 students) low, while only 10.94% (7 students) scored above average and 4.69% (3 students) high. After the training, this distribution shifted markedly toward the higher levels: 54.69% (35 students) scored at the average level, 20.31% (13 students) above average, and 18.75% (12 students) high, while only 4.69% (3 students) scored below average and 1.56% (1 student) low.

Taken together, the “resource” levels (above average + high) rose from 15.63% (10 students) to 39.06% (25 students), while the “elevated risk” levels (below average + low) fell from 40.62% (26 students) to 6.25% (4 students). At the same time, the average level increased from 43.75% (28 students) to 54.69% (35 students). This can be interpreted as a mass shift of a significant proportion of participants out of zones of pronounced vulnerability, with subsequent stabilization, and a rise into the range of elevated stress resilience for a considerable proportion of participants.

In substantive terms, this means that after completing the training, participants less often became “stuck” in overload reactions and were better able to maintain equilibrium under the typical stressors of study and work: anxious hyperreactivity, characteristic of the low level, decreased from 14.06% (9 students) to 1.56% (1 student), while the impulsive and inefficient coping strategies typical of the “below average” level decreased from 26.56% (17 students) to 4.69% (3 students). At the same time, “resource” profiles — characterized by conscious self-regulation, cognitive reappraisal, and planning — increased from 15.63% (10 students) to 39.06% (25 students). In practice, this manifests as a faster return to calm after conflict, a shift toward task-focused action rather than prolonged, intrusive rumination about particular situations, people, or

actions, and the use of simple techniques (breathing exercises, micro-breaks, and similar strategies) to maintain concentration.

The increase in the average level from 43.75% (28 students) to 54.69% (35 students) shows that a substantial part of the group moved from a zone of vulnerability into a stable “norm,” while retaining the potential for further improvement toward the “above average” and “high” levels. Whereas, before the training, a student at the “below average” level might respond to a crunch with an emotional breakdown and chaotic task-switching, afterward such a student follows a pre-rehearsed routine (a “stop signal” technique, brief relaxation, and clarifying priorities), turning the situation into a manageable one. Among those who moved up to the “high” level, a shift from situational to stable self-regulation was observed — from one-off techniques to regular practices (a stressor diary, planning recovery periods) — which reduces the frequency of “breakdowns” and improves the quality of decisions. At the same time, the residual proportion at the “average” level reflects normal variability: without further training, some participants may fluctuate between “average” and “above average,” which is why supportive follow-up modules and exercises to transfer these skills to new, more demanding conditions are advisable.

4.2 Results for the Control Group

As noted above, we then carried out an identical comparative analysis of the results of the two psychodiagnostic assessments for the control group ($n = 63$), whose members did not take part in the training program (Table 2).

Table 2. Wilcoxon signed-rank test results for the control group, first vs. second assessment ($n = 63$)

Psychodiagnostic Measure (First vs. Second Assessment)	Asymptotic Significance, 2-tailed (p)
Stress Resilience Questionnaire (S. Cohen & G. Williamson)	0.060
Volitional Self-Regulation Questionnaire (A.V. Zverkova & E.V. Eidman)	0.357
Multilevel Personality Questionnaire “Adaptability” (A.G. Maklakov & S.V. Chermyanin)	0.141
Reflexivity Diagnostic Questionnaire (A.V. Karpov)	0.285
Emotional Intelligence Questionnaire (N. Hall)	0.143
Personal Maturity Questionnaire (Yu.Z. Gilbukh)	0.564

Note. $p > 0.05$ for all measures, indicating no statistically significant change in the control group.

The results presented in Table 2 show the outcome of the comparative analysis using the nonparametric Wilcoxon signed-rank test in the control group ($n = 63$). Unlike in the experimental group, no statistically significant differences were found between the results of the first and second psychodiagnostic assessments on any of the scales. The asymptotic significance values ranged from $p = 0.060$ to $p = 0.564$, well above the critical level of 0.05. This means that stress resilience, volitional self-regulation, adaptability, reflexivity, emotional intelligence, and personal maturity remained relatively stable over time in the control group in the absence of targeted intervention.

To examine the results of the psychodiagnostic assessment of the control group ($n = 63$) in more detail, a frequency analysis was carried out.

Table 3. Frequency distribution of stress resilience levels in the control group, first vs. second assessment (n = 63)

Level of Development	Pre-Test n	Pre-Test %	Post-Test n	Post-Test %
High	3	4.76	4	6.35
Above average	5	7.94	5	7.94
Average	34	53.97	30	47.62
Below average	10	15.87	14	22.22
Low	11	17.46	10	15.87
Total	63	100.00	63	100.00

Note. Assessed with the Stress Resilience Questionnaire (S. Cohen & G. Williamson).

As Table 3 shows, unlike in the experimental group, change in the control group was weak, confirming the absence of a meaningful effect in the absence of a specifically organized program. The minor fluctuations observed can be explained by natural factors, individual differences, and random variability, whereas no pronounced effect was observed without the training intervention.

On the Stress Resilience Questionnaire by S. Cohen and G. Williamson, the distribution of levels changed only slightly: the high level increased marginally, from 4.76% (3 students) to 6.35% (4 students); the “above average” level remained unchanged at 7.94% (5 students); and the average level decreased from 53.97% (34 students) to 47.62% (30 students). At the same time, the proportion of respondents at the “below average” level increased from 15.87% (10 students) to 22.22% (14 students), while the low level decreased slightly, from 17.46% (11 students) to 15.87% (10 students). This indicates that, in the absence of training, some students even showed a certain decline in stress resilience.

5. DISCUSSION

According to Mukhtorov (2020), approximately 72% of young specialists encountered professional difficulties specifically because of an insufficient level of psychological competence, manifested in difficulties communicating with patients, uncertainty in clinical decision-making, and difficulty managing their own emotional states. The author emphasizes that targeted work on developing self-regulation, empathy, and stress resilience contributes to more successful professional adaptation among medical university graduates, forming an integral part of successful professional development within medical education.

The findings of our study made it possible to develop a training program as a practical means of developing the socio-psychological characteristics underlying the formation of professional skills among medical university students. In essence, the program draws on the target quality identified in the study (stress resilience) and translates it into a system of psychological-pedagogical interventions with a clear six-session structure, each session comprising an introductory block (a mini-lecture providing a theoretical framework), a main training component (exercises on group dynamics, attention and self-control, and working with emotions, values, responsibility, and resources), and mandatory reflection to transfer the experience into educational and clinical practice. Organizationally, the program is designed to run for 1.5–2 months with weekly sessions, is aimed at students aged 18–29, and is implemented in a classroom or training room with basic

equipment and an optimal group size of 10–12 participants, ensuring safety, active participation by everyone, and manageable group dynamics. Overall, the training package developed not only systematizes the content and methods for developing the future physician's key personal competencies but also establishes reproducible conditions and procedures for their formation, providing the methodological and technical readiness needed for subsequent evaluation of its effectiveness in an educational setting.

6. CONCLUSIONS

Thus, on the basis of the foregoing, it can reasonably be concluded that the results of the experimental study conducted ($n = 127$) demonstrate that the specially developed training program, implemented over two months in a small-group format, proved to be an effective tool for developing the key socio-psychological characteristics underlying the formation of professional skills among medical university students. Dividing the student sample into an experimental group ($n = 64$) and a control group ($n = 63$) made it possible to reliably compare changes in the psychodiagnostic indicators over time. A test of the normality of the distribution (Kolmogorov–Smirnov test, $p < 0.05$) indicated the need to apply the nonparametric Wilcoxon signed-rank test, the results of which showed statistically significant improvements across all six psychodiagnostic measures in the experimental group ($p = 0.000$). In the control group, by contrast, the changes were not statistically significant ($p = 0.060$ – 0.564), confirming that the effect observed was specifically attributable to the training intervention.

The frequency analysis additionally showed a pronounced shift in the structure of psychodiagnostic indicator levels in the experimental group: the proportion of respondents with “resource” indicators increased considerably, while the proportion of participants at “elevated risk” levels of stress resilience decreased. These changes reflect a strengthening of psychological readiness for professional activity and the development of stress resilience. The program thus confirmed its practical effectiveness as a targeted means of developing the socio-psychological characteristics needed for medical university students to successfully acquire and apply professional skills.

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