Determination of Main Naval Officer Specialty Groups in the Socialist Republic of Vietnam Based on Psychophysiologic Characteristics

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ABSTRACT

BACKGROUND: The modernization of the Naval Forces of the Socialist Republic of Vietnam and the growing complexity of their technological infrastructure have led to increased specialization of roles and professional competencies among naval personnel. This process is accompanied by progressively differentiated requirements for the development of specific psychophysiologic and personality-based professionally important qualities essential for the effective execution of duties and combat missions. Assessing and considering the level of development of these specialized psychophysiologic and personality traits during the stage of professional selection supports the rational assignment of military personnel and the optimization of training across key naval specialties. In turn, this contributes to improved efficiency and reliability in the performance of professional duties by naval specialists.

AIM: to identify the psychophysiologic and personality-based professionally important qualities required for successful mastery of the main groups of naval specialties.

MATERIALS AND METHODS: The study involved psychologic and psychophysiologic assessments of naval personnel from various specialties within the Naval Forces of the Socialist Republic of Vietnam. A set of methods was used to evaluate neurodynamic and psychomotor properties, cognitive functions (attention, memory, and thinking), as well as motivational and personality traits. In addition, expert evaluations of the trainees' academic and military-professional performance across different specialties were conducted. The results were analyzed using Spearman rank correlation coefficients r and the Kruskal–Wallis analysis of variance. In all cases, the measure of statistical significance for the results of the calculations was a significance level not exceeding 0.05 ($p \leq 0.05$).

RESULTS: The study identified specific professionally important qualities required for the main groups of naval specialties.

CONCLUSION: The study revealed professionally important psychophysiologic characteristics that support more effective performance within selected naval specialty profiles: organizational (command), operational, and engineering-technical. This pilot study demonstrated statistically significant differences among specialty groups in terms of psychologic and psychophysiologic professionally important qualities. The most pronounced difference between personnel in the organizational, engineering-technical, and operational profiles compared with support personnel was observed on the Aspiration for Specialization scale of the Military-Professional Motivation Questionnaire, which reflects the depth and stability of motivation to master a specific military specialty. The most optimal psychophysiologic parameters and functional state indicators were found among personnel in the engineering-technical profile.

Keywords: engineering-technical specialties; operational specialties; organizational specialties; professional psychologic suitability; psychologic selection; rational specialty assignment; naval personnel of the Socialist Republic of Vietnam; support specialties.

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Определение основных групп военно-морских специальностей офицеров Социалистической Республики Вьетнам по психофизиологическим характеристикам

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АННОТАЦИЯ

Актуальность. Модернизация военно-морских сил Социалистической Республики Вьетнам и усложнение технологической базы приводят к увеличению специфики деятельности военно-морских специалистов, усилению дифференцированности требований к развитию специальных профессионально важных качеств моряков для успешного выполнения функциональных обязанностей. Оценка уровня развития психофизиологических и личностных качеств военных моряков на этапе профессионального отбора способствует оптимизации процесса подготовки по основным специальностям, повышению эффективности и надежности военно-профессиональной деятельности специалистов военно-морских сил.

Цель — определение психофизиологических и личностных профессионально важных качеств, необходимых для успешного освоения основных групп военно-морских специальностей.

Материалы и методы. Проведено психологическое и психофизиологическое обследование военно-морских специалистов различного профиля военно-морских сил Социалистической Республики Вьетнам для изучения нейродинамических свойств, когнитивной сферы и личностных качеств. Также проведена экспертная оценка успешности учебной и военно-профессиональной деятельности моряков различных специальностей. Обработка результатов проводилась с помощью корреляционного и дисперсионного анализа.

Результаты. По результатам проведенного исследования определены специальные профессионально важные качества для выделенных групп военно-морских специальностей.

Заключение. В исследовании были выявлены профессионально важные психофизиологические качества, которые способствуют успешной службе по конкретному профилю военно-морских специальностей: организаторскому (управленческому), операторскому, инженерно-техническому. Результаты пилотного исследования определили значимые различия в группах специалистов по психологическим и психофизиологическим профессионально важным качествам: основное отличие группы специалистов организаторского, инженерно-технического и операторского профилей от группы специалистов обеспечивающего персонала.

Ключевые слова: инженерно-технические специальности; операторские специальности; организаторские специальности; профессиональная психологическая пригодность; профессиональный психологический отбор; рациональное распределение по специальностям; специалисты военно-морских сил Социалистической Республики Вьетнам; специальности обеспечивающего профиля.

INTRODUCTION

The modernization of the People's Army of Vietnam Navy (PAVN) requires improving the training of enlisted naval personnel. This ensures that specialists who can manage, operate, and maintain the advanced technology of modern ships and submarines are recruited. PAVN personnel perform activities that require increasingly advanced technology and specialized professional expertise. Therefore, it is currently practically impossible to improve the effectiveness and reliability of military personnel activities without developing a system to select, distribute, and optimize training in specific areas of professional military activity [1]. The methods and criteria for professional psychological and psychophysiological selection and the balanced distribution of specialties should be based on a functional model. The model should consider the activities of different personnel and the psychophysiological qualities necessary for effective performance.

Currently, several general important professional qualities (IPQs) have been identified as necessary for all groups of military specialties in the Russian Armed Forces. These qualities include response time and attention, emotional stability and self-control, unconventional thinking, effective communication, and responsibility [2]. Specialists from the Military Medical Academy have identified these IPQs as required for PAVN submariners [3].

However, research into the occupational psychology of naval personnel revealed that there are specific IPQs associated with goals, tasks, and technical means [4–8].

The specific and diverse professional functions of PAVN personnel and the various conditions of their professional activities make certain psychological and psychophysiological qualities important. These qualities are especially important, and sometimes even critical, for certain specialists and positions. Therefore, they should be considered and evaluated when recruiting and training candidates for these PAVN specialties [9–13].

This study identified four groups of PAVN specialists based on the conditions and content of their professional activities: command personnel, operators personnel, engineers personnel, and support personnel.

The study aimed to identify a list of special IPQs necessary for professional psychological fitness in each group of naval specialties.

METHODS

The study evaluated the psychological and psychophysiological characteristics of PAVN personnel using techniques adapted for this population. These techniques included scores for intellectual abilities (attention, memory, and thinking), motivational factors (military professional motivation [MPM]), personal qualities (e.g., the Multi-Level Personality Questionnaire: Adaptability [MLPQ-A], the Eysenck Personality Inventory [EPI]), and psychomotor and neurodynamic abilities using the Tapping Test. Performance status was assessed based on cardiac rhythm using variational cardiac rhythmography and autonomic nervous system (ANS) function. The success of the professional military activities of the PAVN personnel was also assessed by experts. Submariners of various specialties were evaluated during their everyday activities while performing training combat tasks at the PAVN base.

IBM SPSS Statistics was used to perform mathematical and statistical analyses of the data obtained, including descriptive statistics, correlation analysis, and the Spearman test (r). The Kruskal–Wallis test was used to perform an analysis of variance and comparative analysis. In all cases, the statistical reliability of the calculation results was measured by the significance level, which did not exceed a 0.05 probability ($p \leqslant 0.05$) of the null hypothesis.

RESULTS AND DISCUSSION

The main goal of the study was to compare the psychophysiological and psychological qualities of the selected personnel groups based on the intensity of these qualities and identify unique IPQs for each specialty.

The Kruskal–Wallis test was used to compare the qualities of groups of selected specialties.

Table 1 shows the results of a comparative analysis of different specialty groups based on their motivational qualities, as identified by the MPM questionnaire.

A comparative analysis of variance using the Kruskal–Wallis test revealed no statistically significant differences in these qualities between the groups of specialties. Desire for Specialization (MPM), was the exception. This reflects the depth and stability of the desire to master a specific naval specialty. These scores were statistically significantly lower in the support personnel group (H=13.81, p <0.003) (Fig. 1).

Command personnel had the highest scores, indicating a greater desire to acquire a specific military specialty.

Table 2 presents a comparative analysis of the intensity of personal qualities on the MLPQ-A and EPI in different specialty groups.

The comparative analysis revealed no significant differences in MLPQ-A and EPI scores among the specialty groups. The median scores were similar for all specialty groups.

Command personnel had higher Normal Moral Commitment scores, and support personnel had slightly lower Communication scores. Personal Adjustment scores (MLPQ-A) were higher for the command and engineers

Table 1. Comparative analysis of selected motivational characteristics across specialty groups using the Kruskal–Wallis test

Таблица 1. Сравнительный анализ выраженности отдельных мотивационных характеристик в группах различных специальностей по критерию Краскела–Уоллиса

| Score	p	Specialty groups (Me [Q_{25}; Q_{75}])			
		Command personnel	Operators personnel	Engineers personnel	Support personnel
Appropriateness of Beliefs	≤0.89	13.0 [13.0; 15.0]	13.0 [13.0; 14.0]	13.0 [11.0; 14.0]	12.5 [10.5; 13.0]
Diversity of Interests	≤0.15	14.0 [13.0; 15.0]	15.0 [12.0; 16.0]	13.0 [11.0; 15.0]	11.0 [10.0; 14.75]
Desire for Self-Actualization	≤0.63	12.0 [10.0; 13.0]	11.0 [10.0; 12.0]	12.0 [9.0; 13.0]	11.5 [5.0; 13.0]
Desire for Achievement	≤0.72	12.0 [10.0; 14.0]	12.0 [11.0; 14.0]	12.0 [10.0; 14.0]	13.5 [11.5; 14.25]
Emotional Balance	≤0.82	13.0 [11.0; 14.0]	12.0 [9.0; 14.0]	12.0 [10.0; 14.0]	13.0 [9.25; 15.5]
Optimism	≤0.83	13.0 [12.0; 15.0]	13.0 [11.0; 15.0]	13.0 [11.0; 15.0]	11.5 [9.75; 15.0]
Appropriateness of Desires	≤0.77	11.0 [10.0; 14.0]	12.0 [10.0; 13.0]	11.0 [10.0; 13.0]	12.0 [11.75; 12.25]
Control of Desires	≤0.3	11.0 [10.0; 13.0]	12.0 [11.0; 15.0]	12.0 [11.0; 13.0]	9.5 [8.75; 13.25]
Commitment to Career	≤0.32	10.0 [9.0; 12.0]	10.0 [8.0; 12.0]	11.0 [9.0; 12.0]	11.0 [11.0; 12.25]
Desire for Specialization	≤0.00	14.0 [13.0; 15.0]	13.0 [13.0; 14.0]	13.0 [11.0; 15.0]	10.5 [7.75; 12.0]
Total score of MPM	≤0.16	172.0 [162.0; 184.0]	171.0 [163.0; 177.0]	167.0 [160.0; 177.0]	158.5 [148.5; 173.75]
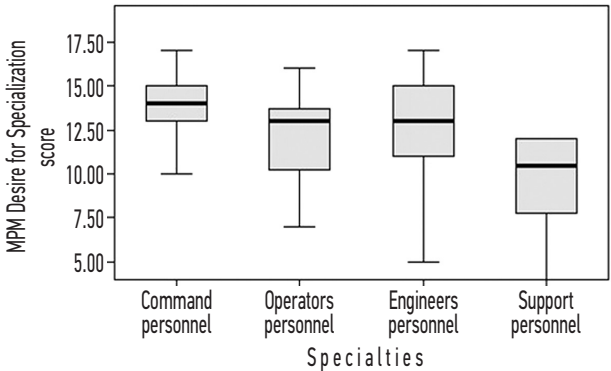
Fig. 1. Distribution of scores on the striving for specialization scale of the external positive motivation method across professional training groups.

Рис. 1. Распределение по шкале «Стремление к специализации» методики ВПМ в группах подготовки специалистов различного профиля.

personnel groups. These groups also reported lower median Neuroticism scores (EPI), indicating higher emotional stability.

Intelligence development and intensity (Figures, S test, Coordinates, Finding Numbers with Switching) and professional psychological fitness were also compared across different groups (Table 3).

A comparative analysis revealed no statistically significant differences in the distribution of intellectual qualities among the study groups. Visual short-term memory scores (Figures) were slightly higher in the command and engineers personnel. There were practically no differences in the median Spatial and Visual Thinking scores (S Test and Coordinates) between the groups. However, Attention scores (Finding Numbers with Switching) were slightly lower in the support personnel group. Integrated

Table 2. Comparative analysis of personality characteristics across specialty groups using the Kruskal–Wallis test, *Me* [Q_{25}; Q_{75}]

Таблица 2. Сравнительный анализ выраженности личностных характеристик в группах различных специальностей по критерию Краскела–Уоллиса, *Me* [Q_{25}; Q_{75}]

Parameters	p	Specialty groups			
		Command personnel	Operators personnel	Engineers personnel	Support personnel
Personal Adjustment, MLPQ-A	≤0.65	118.0 [105.7; 118.0]	114.0 [105.7; 119.5]	115.0 [100.5; 120.5]	112.0 [90.5; 120.25]
Behavior Control, MLPQ-A	≤0.75	78.0 [73.0; 81.0]	76.5 [71.25; 80.0]	75.0 [67.5; 81.0]	77.0 [61.5; 78.5]
Communication, MLPQ-A	≤0.7	22.5 [18.75; 24.25]	22.0 [19.0; 23.75]	22.0 [19.0; 24.0]	19.5 [16.75; 23.0]
Normal Moral Commitment, MLPQ-A	≤0.36	17.0 [14.75; 18.25]	16.0 [13.25; 17.75]	16.0 [13.0; 17.5]	16.0 [14.0; 18.25]
Extraversion, EPI	≤0.25	10.5 [8.0; 12.5]	9.0 [8.0; 11.0]	10.5 [9.0; 12.0]	8.5 [7.5; 10.75]
Neuroticism, EPI	≤0.23	12.0 [8.0; 15.25]	13.5 [11.0; 16.0]	11.5 [9.25; 14.75]	14.5 [10.75; 17.5]

Table 3. Comparative analysis of intellectual characteristics and professional psychologic profile across specialty groups using the Kruskal–Wallis test, *Me* [Q_{25}; Q_{75}]

Таблица 3. Сравнительный анализ интеллектуальных характеристик и ППП в группах различных специальностей по критерию Краскела–Уоллиса, *Me* [Q_{25}; Q_{75}]

Score	p	Specialty groups			
		Command personnel	Operators personnel	Engineers personnel	Support personnel
Figures, Performance	≤0.76	18.0 [12.0; 23.0]	16.0 [12.25; 22.0]	17.0 [12.0; 20.5]	12.5 [11.25; 20.75]
S Test, Performance	≤0.73	58.5 [45.75; 66.25]	55.0 [40.25; 72.5]	57.0 [41.0; 81.5]	66.0 [52.25; 77.75]
Coordinates, Performance	≤0.86	18.0 [13.0; 38.0]	19.0 [12.25; 34.75]	17.0 [12.0; 41.0]	18.0 [12.25; 25.0]
Finding Numbers with Switching	≤0.25	12.0 [9.0; 14.0]	11.0 [8.25; 12.0]	11.5 [9.0; 14.0]	6.5 [3.75; 25.5]
Total Cognitive Score	≤0.56	25.0 [20.0; 28.0]	22.0 [19.0; 25.75]	23.0 [19.75; 28.0]	17.5 [15.25; 25.5]
Integrated Score for Professional Psychological Fitness	≤0.16	18.0 [17.0; 20.0]	18.0 [15.25; 19.75]	17.0 [14.0; 19.0]	14.5 [12.75; 17.25]

intelligence scores were slightly higher in the command personnel group.

Table 4 provides a comparative analysis of the psychomotor and neurodynamic characteristics using the Tapping Test in different groups. The lability and endurance of the nervous system were assessed, and two parameters were estimated: the strength and endurance of the nervous system [11].

The Rapid Tapping test of the nervous system parameters did not reveal any differences in the predominant nervous system types.

Table 5 provides an analysis of cardiac rhythmography among the PAVN personnel groups.

Performance status was deemed optimal in the command personnel group. Operators and engineers personnel demonstrated a near-optimal performance level. The engineers group had the lowest median Stress scores, corresponding to the lower limits of moderate regulatory system stress. Support personnel demonstrated overstress of the regulatory systems.

Figures 2–4 below present histograms of the distribution of rhythmocardiogram parameters by group, showing statistically significant differences.

In summary, the results of the study on PAVN submarine specialists, using techniques for assessing professional psychological suitability for naval service, indicate

Table 4. Comparative analysis of psychomotor performance indicators across specialty groups using the Kruskal–Wallis test, *Me* [Q_{25}; Q_{75}]

Таблица 4. Сравнительный анализ показателей психомоторики в группах различных специальностей по критерию Краскела–Уоллиса, *Me* [Q_{25}; Q_{75}]

Parameters	p	Specialties			
		Command personnel	Operators personnel	Engineers personnel	Support personnel
Lability of the Nervous System	≤0.250	35.00 [32.75; 38.25]	33.00 [30.0; 36.0]	34.0 [33.0; 37.0]	32.0 [29.0; 33.0]
Total Number of Points	≤0.217	200.0 [184.0; 206.0]	186.0 [169.0; 196.0]	193.5 [184.0; 210.0]	172.0 [153.0; 175.0]
Nervous System Strength	≤0.256	1.026 [0.992; 1.045]	1.02 [0.97; 1.04]	1.02 [0.98; 1.05]	1.04 [0.99; 1.06]
Nervous System Endurance	≤0.365	0.93 [0.92; 0.98]	0.93 [0.90; 0.98]	0.914 [0.88; 0.97]	0.89 [0.89; 0.90]

Table 5. Comparative analysis of cardiorhythmography indicators across naval specialty groups using the Kruskal–Wallis test, *Me* [Q_{25}; Q_{75}]

Таблица 5. Сравнительный анализ показателей кардиоритмографии в группах различных военно-морских специальностей по критерию Краскела–Уоллиса, *Me* [Q_{25}; Q_{75}]

Parameters	p	Specialties			
		Command personnel	Operators personnel	Engineers personnel	Support personnel
Performance Status	≤0.68	5.0 [2.5; 5.0]	4.0 [3.0; 4.0]	4.0 [2.0; 4.0]	3.0 [2.0; 3.0]
Performance Status, Score	≤0.74	1.0 [0.0; 1.0]	1.0 [0.0; 1.0]	1.0 [0.0; 1.0]	0.0 [0.0; 0.0]
Mean RR Interval	≤0.005	773.0 [646.0; 804.5]	813.5 [734.5; 903.25]	871.0 [783.0; 946.0]	717.0 [609.0; 717.0]
Heart Rate	≤0.005	3.0 [3.0; 4.0]	2.5 [2.0; 4.0]	2.0 [2.0; 3.0]	4.0 [4.0; 4.0]
Stress Score	≤0.98	289.3 [118.92; 509.45]	210.4 [113.71; 254.24]	164.71 [106.8; 230.3]	793.15 [228.6; 793.2]
Minimal RR Interval	≤0.013	692.0 [641.0; 720.5]	732.5 [659.0; 829.75]	785.0 [716.0; 858.0]	640.0 [573.0; 640.0]
Maximal RR Interval	0.006	826.0 [749.0; 921.0]	898.0 [807.75; 982.0]	943.0 [892.0; 1018.0]	762.0 [644.0; 762.0]

that the IPQs in the study groups are similar in intensity and show almost no statistically significant differences.

For MPM, a statistically significant difference in the Desire for Specialization scores was reported between the command and engineers personnel groups and the support personnel group. These differences reflect the depth and stability of the desire to acquire a certain military specialty. These scores were statistically significantly lower in the support personnel group. The command personnel group reported the highest scores. The results suggest that the command, operators, and engineers personnel groups have a greater desire to acquire a military specialty.

There were also statistically significant differences between these groups in the function of the ANS. The most optimal function of the ANS was found in the engineers personnel group.

To determine the specific IPQs for each group (command, operators, and engineers personnel groups), a correlation analysis was conducted using a Spearman test (r_{xy}) for psychophysiological and psychological qualities with professional activity performance parameters.
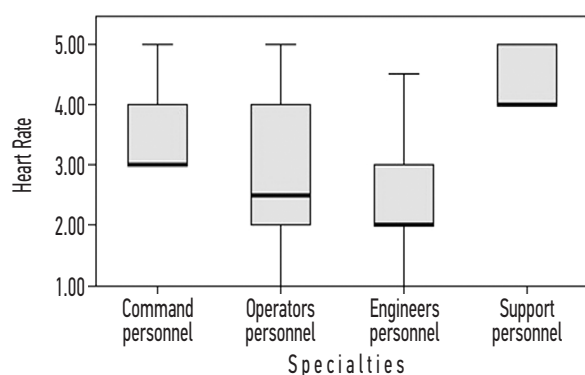
Fig. 2. Heart rate distribution across professional groups.
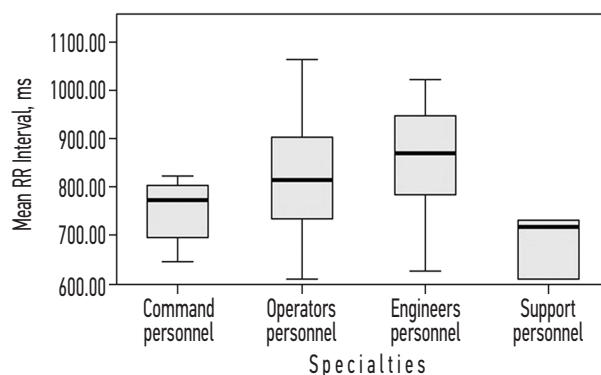**Рис. 2.** Распределение уровня ЧСС в группах специалистов различного профиля.

Fig. 3. Distribution of mean RR interval duration across professional groups.
Рис. 3. Распределение средней длительности RR-интервалов в группах специалистов различного профиля.
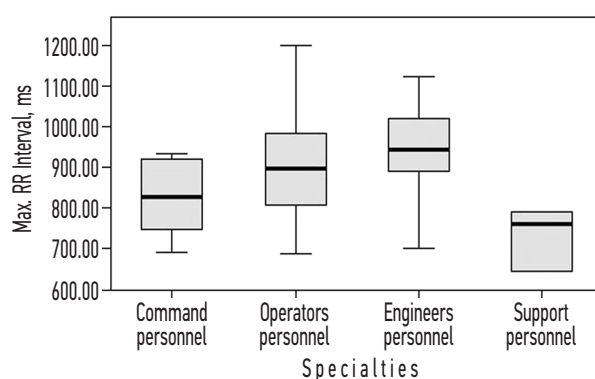

Fig. 4. Distribution of maximum RR interval duration across professional groups.
Рис. 4. Распределение максимальной длительности RR-интервалов в группах специалистов различного профиля.

Three expert scores were used as external criteria to evaluate professional performance:

Successful professional performance;

The presence and acquisition of professional knowledge, skills, and competencies;

Credibility in group; and

Average expert score.

The expert scores were provided by the commanders of the participating units.

The correlation analysis revealed statistically significant correlations between the study parameters and expert scores for Professional Performance in the command personnel group (Table 6).

As shown in the table, the mean expert scores and expert scores for Knowledge, Skills, and Competencies in the command personnel group had moderate positive correlations with Visual Distance Perception and Spatial Thinking (Coordinates, $r_{xy}=0.497$ at $p \leqslant 0.05$) and a high negative correlation with the mean RR Interval (Cardiac Rhythmography, $r_{xy}=-0.643$ at $p \leqslant 0.01$). Expert scores for Knowledge, Skills, and Competencies also had moderate positive correlations with Commitment to Career (MPM, $r_{xy}=0.402$ at $p \leqslant 0.05$).

There were moderate positive correlations of expert scores for Professional Performance with Visual Short-Term Memory scores (Figures, $r_{xy}=0.417$ at $p \leqslant 0.05$) and Integrated Cognitive Scores ($r_{xy}=0.399$ at $p \leqslant 0.05$). There were also high correlations of expert scores for Professional Performance with Spatial Perception and Visual Distance Perception scores (Coordinates, $r_{xy}=0.705$ at $p \leqslant 0.01$). In addition, there were moderate correlations with personal qualities (MLPQ-A) such as Neural and Psychiatric Stability ($r_{xy}=0.500$ at $p \leqslant 0.05$) and Communication ($r_{xy}=0.432$ at $p \leqslant 0.05$).

There were moderate correlations of expert scores for Credibility in Group with Integrated Cognitive Scores ($r_{xy}=0.382$ at $p \leqslant 0.05$), Control of Desires scores (MPM, $r_{xy}=0.447$ at $p \leqslant 0.05$), and Neuroticism scores (EPI, $r_{xy}=0.504$ at $p \leqslant 0.05$).

The analysis revealed correlations between psychological and psychophysiological parameters and expert scores for Professional Performance in the operators personnel group (Table 7).

The correlation analysis showed that in the operators personnel group, there were moderate positive correlations of mean expert scores with Control of Desires

Table 6. Statistically significant correlations between professional and psychologic characteristics and expert evaluations in the managerial specialty group based on Spearman's correlation (r_{xy})

Таблица 6. Статистически значимые корреляционные взаимосвязи ПВК с экспертными оценками в группе специалистов организаторского профиля с применением корреляции Спирмена (r_{xy})

Parameter	Mean Expert Score	Expert Score for Knowledge, Skills, and Competencies	Expert Score for Professional Performance	Expert Score for Credibility in the Group
Personal Qualities				
Personal Adjustment, MLPQ-A, Score			0.500*	
Communication, MLPQ-A, Score			0.432*	
Cognitive Qualities				
Performance, Figures, Score			0.417*	
Performance, Coordinates, Score	0.497*	0.455*	0.705**	
Integrated Score for Professional Psychological Fitness			0.399*	0.382*
Cardiac Rhythmography				
Mean RR Interval	−0.643**	−0.745**		

Note. *$p \leqslant 0.05$; **$p \leqslant 0.01$.
Примечание. *$p \leqslant 0{,}05$; **$p \leqslant 0{,}01$.

scores (MPM, r_{xy}=0.436 at $p \leqslant 0.05$), Spatial and Visual Thinking scores (S Test, r_{xy}=0.474 at $p \leqslant 0.05$), Spatial Ability scores, Visual Distance Perception scores, Attention Allocation scores, and Attention Span scores (Coordinates, r_{xy}=0.476 at $p \leqslant 0.05$), and Integrated Cognitive Scores (r_{xy}=0.462 at $p \leqslant 0.05$).

There were moderate positive correlations of expert scores for Knowledge, Skills, and Competencies with Control of Desires scores (MPM, r_{xy}=0.431 at $p \leqslant 0.05$), Spatial and Visual Thinking scores (S Test, r_{xy}=0.448 at $p \leqslant 0.05$), Spatial Ability scores and Visual Distance Perception scores (Coordinates, r_{xy}=0.439 at $p \leqslant 0.05$), Integrated Cognitive Scores (r_{xy}=0.383 at $p \leqslant 0.05$), and Nervous System Strength scores (Tapping Test, r_{xy}=0.531 at $p \leqslant 0.05$).

There were moderate positive correlations of expert scores for Professional Performance with the total level of MPM (r_{xy}=0.449 at $p \leqslant 0.05$), Spatial Visual Thinking scores (S Test, r_{xy}=0.396 at $p \leqslant 0.05$), Spatial Ability and Visual Distance Perception scores (Coordinates, r_{xy}=0.450 at $p \leqslant 0.05$), Attention Allocation and Attention Switch scores (Searching for Numbers with Switching, r_{xy}=0.485 at $p \leqslant 0.05$), Integrated Cognitive Scores (r_{xy}=0.398 at $p \leqslant 0.05$), integrated Professional Psychological Fitness scores (r_{xy}=0.399 at $p \leqslant 0.05$), as well as moderate negative correlations with Extroversion scores (EPI, r_{xy}=−0.451 at $p \leqslant 0.05$).

There were significant positive correlations of expert scores for Credibility in Group with Normal Moral Commitment (MLPQ-A, r_{xy}=0.632 at $p \leqslant 0.05$) and moderate positive correlations with Visual Memory scores (Figures, r_{xy}=0.432 at $p \leqslant 0.05$), Spatial and Visual Thinking scores (S Test, r_{xy}=0.376 at $p \leqslant 0.05$), Spatial Ability scores

and Visual Distance Perception scores (Coordinates, r_{xy}=0.402 at $p \leqslant 0.05$), Attention Allocation scores and Attention Switch scores (Finding Numbers with Switching, r_{xy}=0.453 at $p \leqslant 0.05$), integrated Professional Psychological Fitness scores (r_{xy}=0.382 at $p \leqslant 0.05$), and Integrated Cognitive Scores (r_{xy}=0.375 at $p \leqslant 0.05$). In addition, there were moderate negative correlations with Neuroticism scores (EPI, r_{xy}=0.423 at $p \leqslant 0.05$).

Table 8 presents statistically significant correlations between psychological parameters and expert scores for Professional Performance in the engineers personnel group.

In the engineers personnel group, there were moderate positive correlations of mean expert scores with Emotional Balance scores (MPM, r_{xy}=0.355 at $p \leqslant 0.05$), with Spatial Perception scores, Visual Distance Perception scores, Attention Allocation scores, and Attention Span scores (Coordinates, r_{xy}=0.323 at $p \leqslant 0.05$), and with integrated scores for Professional Psychological Fitness (r_{xy}=0.324 at $p \leqslant 0.05$). There were also high correlations with Nervous System Strength scores (Tapping Test, r_{xy}=0.597 at $p \leqslant 0.01$).

There were also moderate positive correlations of expert scores for Knowledge, Skills, and Competencies with Emotional Balance scores (MPM, r_{xy}=0.356 at $p \leqslant 0.05$), Normal Moral Commitment scores (MLPQ-A, r_{xy}=0.288 at $p \leqslant 0.05$), Spatial Perception scores and Visual Distance Perception scores (Coordinates, r_{xy}=0.419 at $p \leqslant 0.05$), and Nervous System Strength scores (Tapping Test, r_{xy}=0.433 at $p \leqslant 0.05$) in the group.

There were moderate positive correlations of expert scores for Professional Performance with Emotional Balance scores and total scores (MPM, r_{xy}=0.266

Table 7. Statistically significant correlations between professional and psychologic characteristics and expert evaluations in the operator specialty group based on Spearman's correlation (r_{xy})

Таблица 7. Статистически значимые корреляционные взаимосвязи ПВК с экспертными оценками в группе специалистов операторского профиля с применением корреляции Спирмена (r_{xy})

Parameters	Mean Expert Score	Expert Score for Knowledge, Skills, and Competencies	Expert Score for Professional Performance	Expert Score for Credibility in the Group
Motivation				
Control of Desires, MPM, Score	0.436*	0.431*		
Intelligence Tests				
Performance, Figures, Score				0.435*
S Test, Performance, Score	0.474*	0.448*	0.396*	
Performance, Coordinates, Score	0.476*	0.439*	0.450*	0.376*
Performance, Finding Numbers with Switching, Score			0.485	0.453*
Integrated Cognitive, Score	0.462*	0.383*	0.398*	0.375*
Integrated Score for Professional Psychological Fitness			0.399*	0.382*
Psychomotor and Neurodynamic Qualities				
Nervous System Strength, Tapping Test		0.531*		

Note. *$p \leq 0.05$.
Примечание. *$p \leq 0{,}05$.

Table 8. Statistically significant correlations between professional and psychologic characteristics and expert evaluations in the engineering and technical specialty group based on Spearman's correlation (r_{xy})

Таблица 8. Статистически значимые корреляционные взаимосвязи ПВК с экспертными оценками в группе специалистов инженерно-технического профиля с применением корреляции Спирмена (r_{xy})

Parameters	Mean Expert Score	Expert Score for Knowledge, Skills, and Competencies	Expert Score for Professional Performance	Expert Score for Credibility in the Group
MPM				
Emotional Balance, Score	0.355**	0.356**	0.266*	0.306*
Total Level, Score			0.262*	0.289*
Cognitive Qualities				
Performance, Coordinates, Score	0.323*	0.419**	0.403**	0.333*
Integrated Score for Professional Psychological Fitness	0.324*			0.324*
Psychomotor and Neurodynamic Qualities				
Nervous System Strength, Tapping Test	0.597**	0.433*	0.508*	0.591**
Cardiac Hythmography				
Mean RR Interval			−0.419*	−0.497*

Note. *$p \leq 0.05$; **$p \leq 0.01$.
Примечание. *$p \leq 0{,}05$; **$p \leq 0{,}01$.

and $r_{xy}=0.262$ at $p \leq 0.05$), Spatial Perception scores and Visual Distance Perception scores (Coordinates, $r_{xy}=0.403$ at $p \leq 0.05$), Nervous System Strength scores (Tapping Test, $r_{xy}=0.508$ at $p \leq 0.05$), and integrated scores for Professional Psychological Fitness ($r_{xy}=0.419$ at $p \leq 0.05$).

There were moderate positive correlations of expert scores for Credibility in Group with Appropriateness of Beliefs scores ($r_{xy}=0.404$ at $p \leq 0.05$), Desire for Self-Actualization scores ($r_{xy}=0.311$ at $p \leq 0.05$), Emotional Balance scores ($r_{xy}=0.306$ at $p \leq 0.05$), Optimism scores ($r_{xy}=0.281$ at $p \leq 0.05$), integrated MPM scores ($r_{xy}=0.289$

at $p \leqslant 0.05$), Spatial Perception scores and Visual Distance Perception scores (Coordinates, $r_{xy}=0.333$ at $p \leqslant 0.05$), integrated scores for Professional Psychological Fitness ($r_{xy}=0.324$ at $p \leqslant 0.05$), Total Cognitive Scores ($r_{xy}=0.291$ at $p \leqslant 0,05$), and mean RR intervals ($r_{xy}=0.497$ at $p \leqslant 0.05$). There were also high positive correlations with Nervous System Strength scores (Tapping Test, $r_{xy}=0.591$ at $p \leqslant 0.01$).

Comparative and correlation analyses revealed that emotional balance was the primary IPQ for engineers personnel.

The IPQs evaluated in this study contribute multidirectionally to the professional performance of different naval personnel. Key contributing factors across all groups included motivational parameters, spatial perception, visual distance perception, high attention span, and attention allocation.

The significance of IPQs for different groups was also determined.

The most significant qualities for professional performance assessment in the command personnel group are personal traits such as professional motivation and high personal adjustment. Visual short-term memory, spatial perception, and visual distance perception are important intelligence characteristics that contribute to professional performance.

In the operators personnel group, the majority of correlations with expert scores were found for characteristics of intelligence, such as visual short-term memory, attention switch and allocation, spatial and visual thinking, and spatial perception. Personality traits, such as normal moral commitment (as measured by the MLPQ-A) and emotional stability and neuroticism (as measured by the EPI), influenced credibility within the group only.

In the engineers personnel group, many correlations were found with professional motivation characteristics. Regarding the characteristics of intelligence, the command personnel group only showed positive correlations with integrated scores for professional psychological fitness and spatial perception. This group showed statistically significant positive correlations of all expert scores with nervous system strength, as measured by the Tapping Test and the lowest stress scores, as measured by cardiac rhythmography.

CONCLUSION

The study revealed significant differences in psychological IPQs between the groups. For example, statistically significant differences in the desire for specialization, as measured by the MPM, were reported between the command and engineers personnel groups and the support personnel group. These differences reflect the depth and stability of the desire to acquire a

particular military specialty and the function of the ANS. The optimal function of the ANS and the performance status were found in the engineers personnel group.

The predictive value of IPQs for professional performance depends on the professional activity structure and functions. A greater number of significant correlations for professional performance were found with personal traits in the command personnel group and with attention, thinking, perception, and nervous system characteristics in the operators personnel group. The most important qualities in the engineers personnel group were motivational characteristics and nervous system adjustment.

The study revealed the IPQs necessary for higher performance in the selected naval activities, including those of command, operators, and engineers personnel.

Professional performance in the command personnel group is associated with cognitive characteristics such as visual memory, spatial perception, visual distance perception, attention allocation and switching, and personal adjustment and communication.

Professional performance in the operators personnel group is associated with control of desires and extroversion/introversion, integrated cognitive scores, spatial perception, and visual distance perception (coordinates).

Professional performance in the engineers personnel group is associated with appropriateness of beliefs, diversity of interests, desire for self-actualization, emotional balance, optimism, commitment to career, normal moral commitment, spatial perception, visual distance perception, and attention allocation and switching.

Correlation analysis revealed significant correlations between expert scores and most professional selection criteria, and the rational distribution of PAVN submarine personnel in various specialties. To clarify the contribution of the identified IPQs to professional performance in various specialty groups, further research is required to optimize the methodology and develop mathematical equations for the criteria-based personnel distribution between specialties.

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