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ORIGINAL ARTICLE

Toward professional readiness: psychophysiological predictors of efficiency in rehabilitation students

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ABSTRACT

Aim: The aim of the study was to carry out a professional evaluation of the work process and to establish the relationship between psychophysiological functions of the organism that ensure high professional success of rehabilitation specialists

Materials and Methods: A job-related assessment was conducted, incorporating psychophysiological evaluation, expert analysis, and dynamic observation of rehabilitation specialists, including physicians in physical and rehabilitation medicine, physiotherapists, occupational therapists, and their assistants. A specially designed questionnaire with 57 items was utilized to evaluate the professional significance of various psychophysiological functions. Statistical analysis, including descriptive statistics, cluster analysis, and correlation analysis, was performed using the Statistica 6.1 software package to determine the interrelations among key psychophysiological characteristics.

Results: The study identified a set of core psychophysiological functions essential for rehabilitation professionals, including reaction speed, endurance, coordination, sensory perception, and cognitive abilities. Cluster analysis revealed three primary competency groups: (1) higher nervous activity and attention, (2) visual sensory system and movement coordination, and (3) sensory-motor integration and cognitive functions. The correlation analysis demonstrated strong interdependencies among these attributes, with significant relationships observed between higher nervous activity and key visual sensory functions.

Conclusions: The research highlights the necessity of an integrated approach to professional training for rehabilitation specialists. A structured understanding of psychophysiological functions can help refine educational curricula and enhance practical training methodologies. The findings emphasize the importance of individualized training strategies tailored to the functional demands of specific rehabilitation professions

KEYWORDS: rehabilitation, professional competence, psychophysiology, occupational therapy, physical therapy modalities

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INTRODUCTION

In the context of professional education for rehabilitation-related specialties, the identification and scientific substantiation of specific psychophysiological functions that underpin successful professional performance is of critical importance. Modern training programmes must not only deliver theoretical knowledge and practical skills but also ensure that students develop the functional capabilities necessary for high-efficiency work in complex rehabilitation environments. One effective tool for achieving this is the professionogram – a structured, evidence-based profile that outlines the functional requirements of a given profession. Within this framework, particular emphasis is placed on psychophysiograms, which detail the psychophysiological attributes essential for professional efficiency, such as motor coordination, sensory perception, cognitive endurance, and attentional control [1, 7-11].

By analysing these functions, it becomes possible to assess students' professional readiness and tailor educational strategies to support the development of capacities that directly influence performance. Such an approach is especially relevant in rehabilitation disciplines, where the integration of sensory, cognitive, and neuromotor systems is vital to patient care [2, 4, 7, 9, 12].

AIM

The aim of the study was to carry out a professional evaluation of the work process and to establish the relationship between psychophysiological functions of the organism that ensure high professional success of rehabilitation specialists.

MATERIALS AND METHODS

The present scientific study was conducted at the premises of Vinnytsia National Pirogov Memorial Medical University, Vinnytsia State Mykhailo Kotsiubynskyi Pedagogical University, and the Vinnytsia Socio-Economic Institute of the Open International University of Human Development "Ukraine". Over the period 2023-2025, a total of 312 medical faculty students – 156 female and 156 male – were observed under academic supervision. The participants were enrolled in the professional educational programmes "Therapy and Rehabilitation" and "Medicine". These programme profiles constituted the principal inclusion and exclusion criteria for assigning individuals to the respective comparison groups.

It should be noted that the "Therapy and Rehabilitation" educational programme is oriented towards the theoretical and practical training of highly qualified and labour-market-competitive specialists in the field of therapy and rehabilitation. Graduates are expected to work either independently within multidisciplinary rehabilitation teams or under supervision, implementing interventions aimed at restoring the functional integrity of various human body systems, including psychological dimensions of life activity. Emphasis is placed on practice-based learning and the application of rehabilitation strategies tailored to achieving specific rehabilitation goals and addressing patients' individualised needs.

By contrast, the "Medicine" programme aims to ensure that students acquire the competences necessary to apply their theoretical knowledge, practical skills, and professional understanding –across humanities, basic sciences, and clinical disciplines – in solving standard professional tasks associated with medical practice. The scope of this programme includes the diagnosis and management of conditions according to established symptom and syndrome classifications, the handling of physiological states and diseases requiring specific clinical management strategies, emergency care, laboratory and instrumental diagnostics, as well as the performance of essential medical procedures.

As part of the scientific research, a job-related psychophysiological assessments were carried out for rehabilitation-related professions such as doctors of physical and rehabilitation medicine, physiotherapists, occupational therapists, physiotherapy assistants and occupational therapy assistants. The methodologies employed included medical-sociological analysis, expert evaluation, and dynamic observation of professional activity.

Expert evaluation of the professional activities of rehabilitation specialists, who form the core of a multidisciplinary rehabilitation team, was carried out in several key stages:

1. Identifying the primary rehabilitation profiles subject to study.
2. Developing a specialised questionnaire for scoring the professional importance of psychophysiological functions for the defined specialities.
3. Selecting a panel of experienced experts with at least 5-10 years of professional experience in the studied field or those teaching relevant subjects in higher education institutions.
4. Conducting a job-related psychophysiological examination.
5. Performing statistical analysis and interpretation of the obtained data.

For these purposes, a specially designed expert evaluation questionnaire consisting of 57 questions was used to determine the level of professional significance of psychophysiological functions. The data obtained during the expert evaluation were validated through dynamic observation of professional activities.

Statistical analysis was conducted using the standard package for multivariate statistical analysis, "Statistica 6.1" (Licence No. VXXR901E245722FA). The study applied descriptive statistics, cluster analysis, and correlation analysis. The reliability of the obtained results was determined using both parametric and non-parametric methods, including Student's t-test and Pearson's chi-square test, with subsequent significance assessment (p).

The implementation of any classification-based procedures (such as cluster and correlation analysis), including the development and scientific substantiation of psychophysiograms for core rehabilitation-related professions, necessitates the application of a range of multivariate statistical analysis techniques. Specifically, cluster analysis facilitates the identification of patterns in the grouping of research objects and their primary characteristics into distinct sets and subsets, i.e., clusters, which represent homogeneous units within the multidimensional space of examined features. This requires the application of k-means methodology (divisive method, MacQueen algorithm) or agglomerative-hierarchical methods. In our case, the k-means methodology is considered the most appropriate. Thus in the cluster analysis of key psychophysiological characteristics, spatial classification of these characteristics was performed using the k-means method (divisive method, McQueen algorithm) in a multidimensional space of the studied factors. Correlation analysis established the functional interconnections of the obtained data based on Pearson (r) and Spearman (rs) correlation coefficients, determining their significance levels (p).

RESULTS

In the course of the conducted research, a psychophysiological assessments of rehabilitation-related professions (physician in physical and rehabilitation medicine, physiotherapist, occupational therapist etc.) was carried out, and its role in ensuring the effective training of rehabilitation specialists was determined.

It was established that the professionally significant psychophysiological functions of key rehabilitation professions, which define the primary components of their psychophysiogram, include indicators of simple and differentiated visual-motor reaction speed, balance and mobility of neural processes, endurance of the nervous system, strength of excitation and inhibition processes, as well as resistance to monotony effects. Additionally, parameters such as visual acuity, differentiated light sensitivity, visual field volume, critical flicker fusion frequency, and visual

perception speed were identified. Other key characteristics include differentiated musculoskeletal sensitivity, dexterity and coordination of finger movements, coordination of hand movements, combined coordination of hand movements, hand coordination with and without visual control, movement tempo, combined coordination of hand and foot movements, muscular endurance, and hand muscle strength. Moreover, attention-related indicators, including volume, switching, distribution, stability, and concentration, as well as semantic working memory, operational and practical thinking, and spatial imagination, were found to be critical.

In particular, when examining the representation of specific properties of the visual sensory system within the psychophysiographic structure of core rehabilitation-related specialities, it should be noted that, in all cases, the leading positions within the structure are occupied by visual acuity and differential light sensitivity (first level of importance); followed by critical flicker fusion frequency, visual perception speed, and visual field size (second level of importance); and, finally, by colour discrimination and differential colour discrimination (third level of importance) (Table1).

Conversely, when analysing the representation of specific properties of the somatosensory analyser within the psychophysiographic profiles of the main rehabilitation specialities, it is important to highlight that, in all cases, primary importance is attributed to joint–muscle sensitivity and differential joint–muscle sensitivity (first level of importance); followed by indicators of coordination of movements of various types and origins (second level of importance); and, finally, by measures of muscular endurance and upper limb strength (third level of importance) (Table 2).

The presence of these psychophysiological functions within the psychophysiogram structure of core rehabilitation-related professions is of significant theoretical importance. It highlights both the commonality and unity of most of these functions, as well as certain structural particularities of specific functions. Consequently, this underscores the necessity of considering these factors in the process of developing scientifically justified strategies for improving the professional training of future rehabilitation specialists, both at the educational stage and during direct professional practice.

Equally significant as the development of such professional profiles and psychophysiograms is the establishment of interconnections between individual professionally significant psychophysiological functions. These functions shape and maintain the working dynamic stereotype, which is determined using multivariate statistical analysis procedures such as cluster and correlation analysis.

An analysis of the obtained expert assessments regarding the degree of development of psychophysiological functions – reflecting the functional state of higher nervous activity, the visual sensory system, and other sensory systems, the somatosensory analyser, as well as characteristics of attention, memory, thinking, and imagination – demonstrates that the cluster structure of leading groupings, based on the k-means methodology, for professions such as physician in

Table 1. Professionally Important Psychophysiological Functions (Indicators of the functional state of the visual sensory system) required for the effective acquisition of core rehabilitation-related specialists, which constitute the foundation of their psychophysiograms.

	Physician in Physical and Rehabilitation Medicine	Physical Therapist	Occupational Therapist	Physical Therapist Assistant	Occupational Therapy Assistant
Indicators of the functional state of the visual sensory system	Visual acuity (5.00 points) Differentiated light sensitivity (5.00 points) Critical Flicker Fusion frequency (5.00 points) Visual perception speed (5.00 points) Visual field volume (4.90±0.10 points) Differentiated color discrimination (4.60±0.22 points) Color discrimination (4.50±0.13 points) Dark and light adaptation (4.60±0.16 points) Spatial adaptation (4.40±0.16 points)	1.Visual acuity (5.00 points) 2.Differentiated light sensitivity (5.00 points) 3.Critical Flicker Fusion frequency (5.00 points) 4.Visual perception speed (5.00 points) 5.Visual field volume (4.90±0.10 points) 6.Color discrimination (4.30±0.21 points) 7.Differentiated color discrimination (4.10±0.17 points) 8.Spatial adaptation (4.20±0.13 points) 9.Dark and light adaptation (3.90±0.10 points)	1.Visual acuity (5.00 points) 2. Differentiated light sensitivity (5.00 points) 3. Critical Flicker Fusion frequency (5.00 points) 4. Visual perception speed (5.00 points) 5. Visual field volume (5.00 points) 6. Color discrimination (4.30±0.21 points) 7.Differentiated color discrimination (4.10±0.17 points) 8. Spatial adaptation (4.30±0.15 points) 9. Dark and light adaptation (3.90±0.10 points)	Visual acuity (5.00 points) Differentiated light sensitivity (5.00 points) Critical Flicker Fusion frequency (5.00 points) Visual perception speed (5.00 points) Visual field volume (5.00 points) Differentiated color discrimination (4.10±0.17 points) Color discrimination (4.30±0.21 points) Spatial adaptation (4.30±0.15 points) Dark and light adaptation (3.90±0.10 points)	Visual acuity (5.00 points) Differentiated light sensitivity (5.00 points) Critical Flicker Fusion frequency (4.70±0.15 points) Visual perception speed (4.80±0.13 points) Differentiated color discrimination (3.70±0.15 points) Color discrimination (3.70±0.15 points) Visual field volume (3.60±0.16 points) Spatial adaptation (3.90±0.23 points) Dark and light adaptation (3.10±0.23 points)

Table 2. Professionally Significant Psychophysiological Functions (Indicators of the functional state of the somatosensory analyzer) required for the effective acquisition of core rehabilitation-related specialties, which constitute the foundation of their psychophysiograms

	Physician in Physical and Rehabilitation Medicine	Physical Therapist	Occupational Therapist	Physical Therapist Assistant	Occupational Therapy Assistant
Indicators of the functional state of the somatosensory analyzer	1.Differentiated musculoskeletal sensitivity (5.00 points) 2.Musculoskeletal sensitivity (5.00 points) 3. Hand movement coordination (4.90±0.10 points) 4.Combined hand movement coordination (4.90±0.10 points) 5.Hand movement coordination without visual control (4.80±0.13 points) 6.Movement tempo (4.70±0.15 points) 7.Dexterity and coordination of finger movements (4.50±0.16 points) 8.Hand movement coordination under visual control (4.70±0.15 points) 9.Combined coordination of hand and leg movements (4.00±0.14 points) 10. Hand muscle strength (3.90±0.10 points) 11.Hand muscle endurance (3.90±0.17 points)	1.Differentiated musculoskeletal sensitivity (5.00 points) 2.Musculoskeletal sensitivity (5.00 points) 3.Dexterity and coordination of finger movements (5.00 points) 4. Hand movement coordination (5.00 points) 5.Combined hand movement coordination (5.00 points) 6.Hand movement coordination without visual control (5.00 points) 7.Hand movement coordination under visual control (5.00 points) 8.Movement tempo (5.00 points) 9.Combined coordination of hand and leg movements (4.60±0.16 points) 10.Hand muscle endurance (4.20±0.13 points) 11.Hand muscle strength (4.10±0.17 points)	1.Differentiated musculoskeletal sensitivity (5.00 points) 2.Musculoskeletal sensitivity (5.00 points) 3.Dexterity and coordination of finger movements (5.00 points) 4.Hand movement coordination (5.00 points) 5.Combined hand movement coordination (5.00 points) 6.Hand movement coordination without visual control (5.00 points) 7.Hand movement coordination under visual control (5.00 points) 8.Movement tempo (5.00 points) 9.Combined coordination of hand and leg movements (4.50±0.16 points) 10.Hand muscle endurance (4.20±0.13 points) 11.Hand muscle strength (4.10±0.17 points)	1.Differentiated musculoskeletal sensitivity (5.00 points) 2.Musculoskeletal sensitivity (5.00 points) 3.Dexterity and coordination of finger movements (5.00 points) 4.Hand movement coordination (5.00 points) 5.Combined hand movement coordination (5.00 points) 6.Hand movement coordination without visual control (5.00 points) 7.Hand movement coordination under visual control (5.00 points) 8.Movement tempo (5.00 points) 9.Combined coordination of hand and leg movements (4.50±0.16 points) 10.Hand muscle endurance (4.20±0.13 points) 11.Hand muscle strength (4.10±0.17 points)	1.Differentiated musculoskeletal sensitivity (5.00 points) 2.Musculoskeletal sensitivity (5.00 points) 3.Dexterity and coordination of finger movements (5.00 points) 4.Hand movement coordination (5.00 points) 5.Combined hand movement coordination (5.00 points) 6.Hand movement coordination without visual control (5.00 points) 7.Hand movement coordination under visual control (5.00 points) 8.Movement tempo (5.00 points) 9.Hand muscle endurance (4.50±0.10 points) 10.Combined coordination of hand and leg movements (4.50±0.16 points) 11.Hand muscle strength (4.10±0.17 points)

physical and rehabilitation medicine, physiotherapist, and occupational therapist, was characterised by the presence of three primary clusters, namely:

1. The "functional capabilities of higher nervous activity and attention" cluster (Cluster № 1), encompassing characteristics of simple and differentiated visual-motor reaction speed, balance and mobility of neural processes, strength of excitation and inhibition processes, nervous system endurance, as well as attention-related indicators such as volume, switching, distribution, stability, and concentration.
2. The "functional capabilities of the visual sensory system, movement coordination, and attention" cluster (Cluster № 2), which integrates indicators of visual acuity, differentiated light sensitivity, visual field volume, critical flicker fusion frequency, and visual perception speed. Additionally, it includes indicators of differentiated musculoskeletal sensitivity, dexterity and coordination of finger movements, coordination of hand movements with and without visual control, movement tempo, combined coordination of hand and foot movements, muscular endurance, and hand muscle strength, as well as attention-related parameters such as volume, switching, distribution, stability, and concentration.
3. The "functional capabilities of other sensory systems, memory, thinking, and imagination" cluster (Cluster № 3), comprising characteristics of differentiated tactile sensitivity, proprioceptive sensitivity, and spatial-auditory orientation, alongside indicators of semantic working memory, operational and practical thinking, and spatial imagination.

Simultaneously, for the forms of occupation such as physiotherapy assistant and occupational therapy assistant, a certain redistribution of the content within the identified cluster groupings was observed. Consequently, the structure still included three primary clusters, but with slightly different content:

1. The "functional capabilities of higher nervous activity" cluster (Cluster № 1), incorporating characteristics of simple and differentiated visual-motor reaction speed, balance and mobility of neural processes, strength of excitation and inhibition processes, and nervous system endurance.
2. The "functional capabilities of the visual sensory system, movement coordination, and attention" cluster (Cluster № 2), which consolidates indicators of visual acuity, differentiated light sensitivity, visual field volume, critical flicker fusion frequency, and visual perception speed. It also includes differentiated musculoskeletal sensitivity, dexterity and coordination of finger movements, coordination of hand movements with and without visual control, movement tempo, combined coordination of hand and foot movements, muscular endurance, and hand muscle strength, as well as attention-related parameters such as volume, switching, distribution, stability, and concentration.
3. The "functional capabilities of other sensory systems, memory, thinking, and imagination" cluster (Cluster № 3), comprising characteristics of differentiated tactile sensitivity, proprioceptive sensitivity, and spatial-auditory orientation, along with indicators of semantic working memory, operational and practical thinking, and spatial imagination.

The structural features of the identified cluster groupings are presented in Fig. 1 and 2.

The data obtained through correlation analysis procedures confirm the previous results. Firstly, it was found that the highest number of statistically significant correlations

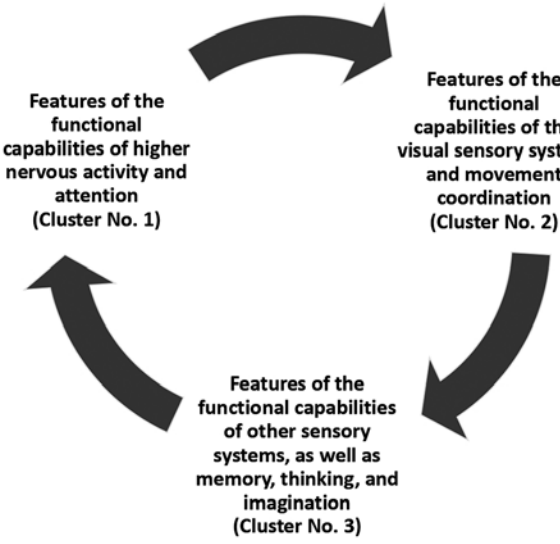

Fig. 1. The structure of the main clusters of psychophysiological functions characteristic of such specialties as a physician in physical and rehabilitation medicine, a physical therapist, and an occupational therapist

Source: compiled by the authors of this study

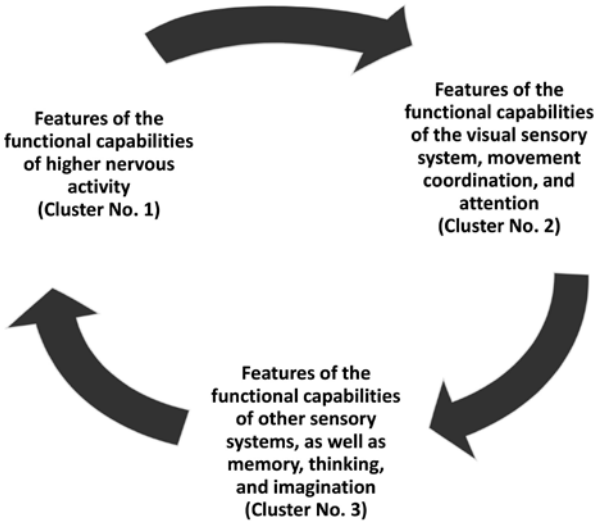

Fig. 2. The structure of the main clusters of psychophysiological functions characteristic of such form of occu pationas a physical therapist assistant and an occupational therapist assistant

Source: compiled by the authors of this study

($p<0.05$-0.001) between the characteristics of the functional state of higher nervous activity, which indicate a high level of psychophysiological readiness for performing core activities of rehabilitation specialists, is characteristic of such professions as a physician in physical and rehabilitation medicine (38 correlations), physiotherapist (35 correlations), and occupational therapist (33 correlations). The lowest number was observed for physiotherapy assistant (27 correlations) and, primarily, occupational therapy assistant (25 correlations). Similarly, correlations between specific indicators reflecting the functional state of the visual sensory system were most prevalent in professions such as a physician in physical and rehabilitation medicine (46 correlations), physiotherapist (44 correlations), and occupational therapist (41 correlations), with slightly fewer for physiotherapy assistants (38 correlations) and occupational therapy assistants (36 correlations). Correlations between indicators reflecting the functional state of the somatosensory analyser were highest for a physician in physical and rehabilitation medicine (48 correlations), physiotherapist (52 correlations), and occupational therapist (55 correlations), while the lowest numbers were observed for physiotherapy assistants (42 correlations) and occupational therapy assistants (40 correlations).

Secondly, when considering individual rehabilitation-related professions, it is essential to note that the highest number of significant ($p<0.05$-0.001) correlations related to the functional state of the higher nervous system were associated with characteristics of simple and differentiated visual-motor reactions, balance and mobility of neural processes, endurance of the nervous system, and resistance to monotony effects. The highest number of significant ($p<0.05$-0.001) correlations in the functional state of the visual sensory system was linked to indicators such as critical flicker fusion frequency, differentiated light sensitivity, visual perception speed, visual field volume, and differentiated colour perception. Additionally, the highest number of significant ($p<0.05$-0.001) correlations in the functional state of other sensory systems was associated with characteristics of differentiated tactile sensitivity, proprioceptive sensitivity, and spatial-auditory orientation. Furthermore, the highest number of significant correlations in the functional state of the somatosensory analyser was observed in indicators such as differentiated musculoskeletal sensitivity, hand movement coordination, combined coordination of hand movements, hand movement coordination without visual control, movement tempo, finger dexterity and coordination, hand movement coordination under visual control, and muscular endurance of the hands. Finally, the highest number of significant ($p<0.05$-0.001) correlations in the functional characteristics of attention, memory, and thinking were associated with attention volume, switching, distribution, stability, and concentration, as well as semantic working memory, practical thinking, and spatial imagination.

DISCUSSION

While performing a psychophysiographic analysis of the collected data – an approach for which the modern literature offers no direct counterparts (only distant analogues [2, 3] addressing other branches of medical practice) – it should be emphasized that, for the leading rehabilitation-oriented specialties, the professionally significant psychophysiological functions include the following characteristics of higher nervous activity and sensory systems:

- speed of simple and discriminative visual motor reactions;
- balance and mobility of neural processes;
- nervous-system endurance;
- strength of excitation and inhibition processes and resistance to monotony;
- visual-system indices such as visual acuity, differential light sensitivity, visual-field extent, and critical flicker--fusion frequency;
- differential muscle-joint (proprioceptive) sensitivity;
- dexterity and coordination of finger and arm movements;
- muscular endurance and arm strength;
- attentional volume, shifting, distribution, stability, and concentration.

In reviewing these results, one must first note the considerable diversity of professionally important psychophysiological functions whose high development ensures maximal task performance by rehabilitation specialists. This finding is consistent with earlier studies on other medical professions – particularly in dentistry and general medicine [2, 3] – and, crucially, holds true even under pronounced stress conditions [1].

This situation was evidenced by the almost complete "unanimity" of indicators, confirming their undeniable necessity for inclusion both in the structure of the psychophysiograms being developed and in the diagnostic algorithms being substantiated to train highly qualified rehabilitation specialists and ensure their coordinated work within a multidisciplinary rapid response team, which provides comprehensive socio-psychological support to victims during medical care delivery.

At the same time, attention was drawn to a certain "internal diversity" of the established features, particularly the tendency toward a slight decrease in the expression level of higher nervous activity indicators reflecting the strength of excitation and inhibition processes in the central nervous system among representatives of different form of occupation, primarily assistants to specialised physicians.

Thus, based on the analysis of the functional capabilities of higher nervous activity, it was evident that in the structure of psychophysiograms of core rehabilitation-related specialities, the leading positions were occupied by simple and differentiated visual-motor reaction speed (first level of importance), balance and mobility of neural processes, and nervous system endurance (second level of importance), as well as the strength of excitation and inhibition processes in higher nervous activity (third level of importance).

It is also undeniable that one of the most important components of psychophysiograms for rehabilitation physicians includes data obtained through expert assessments of the

development level of psychophysiological functions reflecting the functional state of the visual sensory system. In this regard, the leading positions were occupied by indicators of visual acuity and differentiated light sensitivity (first level of importance), critical flicker fusion frequency, visual perception speed, and visual field volume (second level of importance), as well as characteristics of colour differentiation and differentiated colour perception (third level of importance).

Finally, when examining the representation of specific properties of the somatosensory analyser within the psychophysiogram structure of core rehabilitation-related professions, it was evident that, in all cases, the leading positions were occupied by indicators of musculoskeletal sensitivity and differentiated musculoskeletal sensitivity (first level of importance), indicators of coordination of various types of movements and their genesis (second level of importance), as well as muscular endurance and hand muscle strength (third level of importance).

These findings were also confirmed by the results of cluster and correlation analyses, which identified specific target criteria for psychohygienic, psychocorrectional, and psychophysiological interventions. These criteria were delineated separately for such professions as a physician in physical and rehabilitation medicine, physiotherapist, and occupational therapist (Group 1) and separately for such forms of occupation as physiotherapy assistant and occupational therapy assistant (Group 2).

CONCLUSIONS

In the course of the conducted research, it was identified that the professionally significant psychophysiological functions of key rehabilitation-related specialities, which determine the primary components of their psychophysiogram, include indicators of simple and differentiated visual-motor reaction speed, balance and mobility of neural processes, nervous system endurance, strength of excitation and inhibition processes, as well as resistance to monotony effects. Additionally, characteristics such as visual acuity, differentiated light sensitivity, visual field volume, critical flicker fusion frequency, and consequently, the lability of the visual sensory system and visual perception speed were considered. Other significant features included differentiated musculoskeletal sensitivity, dexterity and coordination of finger movements, hand movement coordination, combined hand movement coordination, hand coordination with and without visual control, movement tempo, combined coordination of hand and foot movements, muscular endurance, and hand muscle strength. Furthermore, key indicators related to attention capacity, switching, distribution, stability, and concentration, as well as semantic working memory, operational and practical thinking, and spatial imagination were identified as critical.

According to the results of cluster analysis procedures, the structure of the leading groupings of the examined psychophysiological functions for professions such as a physician in physical and rehabilitation medicine, physiotherapist, and occupational therapist was characterised by the presence of three primary clusters:

1. Cluster "Functional capabilities of higher nervous activity and attention" (Cluster № 1).
2. Cluster "Functional capabilities of the visual sensory system, movement coordination, and attention" (Cluster № 2).
3. Cluster "Functional capabilities of other sensory systems, memory, thinking, and imagination" (Cluster № 3).

At the same time, for physiotherapy assistant and occupational therapy assistant, three primary clusters were also identified but with slightly different content:

1. Cluster "Functional capabilities of higher nervous activity" (Cluster №1).
2. Cluster "Functional capabilities of the visual sensory system, movement coordination, and attention" (Cluster № 2).
3. Cluster "Functional capabilities of other sensory systems, memory, thinking, and imagination" (Cluster № 3), which includes characteristics of differentiated tactile sensitivity, proprioceptive sensitivity, and spatial-auditory orientation, as well as indicators of semantic working memory, operational and practical thinking, and spatial imagination.

REFERENCES

1. Beamish N, Footer C, Lowe R, Cunningham S. Rehabilitation professions' core competencies for entry-level professionals: a thematic analysis. J Interprof Care. 2024;38(1):32-41. doi: 10.1080/13561820.2023.2241519.
2. Conradie T, Louw Q, Berner K. Rehabilitation workforce descriptors: a scoping review. BMC Health Serv Res. 2022;22(1):1169. doi: 10.1186/s12913-022-08531-z.
3. Da Ros A, Tozzo P, Caenazzo L. Rehabilitation healthcare professionals' perceptions of professional responsibility: a focus group study in Italy. Acta Biomed. 2021;92 (Suppl 2): e2021021. doi: 10.23750/abm.v92iS2.11279.
4. Hallé MC, Bussières A, Asseraf-Pasin L et al. Building evidence-based practice competencies among rehabilitation students: a qualitative exploration of faculty and preceptors' perspectives. Adv Health Sci Educ Theory Pract. 2021;26(5):1311-1338. doi: 10.1007/s10459-021-10051-0.
5. Liu Y, Li J, Zheng J, Zhang Y. Analysis of the effect of rehabilitation nursing intervention on postoperative recovery of patients with spinal fractures. Pak J Med Sci. 2022;38(1):234-239. doi: 10.12669/pjms.38.1.4235.
6. Mills JA, Cieza A, Short SD, Middleton JW. Development and validation of the WHO Rehabilitation Competency Framework: a mixed methods study. Arch Phys Med Rehabil. 2021;102(1):111-127. doi: 10.1016/j.apmr.2020.06.036.
7. Moroz VM, Makarov SYu, Serebrennikova OA, Serheta IV. Navchalnyi stres ta psykhofiziolohichni kryterii otsinky adaptatsiinykh mozhlyvostei orhanizmu studentiv zakladiv vyshchoi medychnoi osvity [Educational stress and psychophysiological criteria for assessing the adaptive capacity of the body of students of higher medical education]. Vinnytsia: TOV "TVORY"; 2020. 184 p. (Ukrainian)

8. Moroz VM, Serebrennikova OA, Serheta IV, Stoian NV. Psykhofiziolohichni ta psykhohihiienichni osnovy efektyvnoho vykorystannia zdoroviazberihaiuchykh tekhnolohii u zakladakh vyshchoi osvity [Psychophysiological and psychohygienic bases of effective use of health-preserving technologies in institutions of higher education]. Vinnytsia: TOV "TVORY"; 2021. 208 p. (Ukrainian)
9. Serheta IV, Panchuk OYu, Yavorovskyi OP. Hihiienichna diahnostyka profesiinoi prydatnosti studentiv zakladiv medychnoi osvity (na prykladi stomatolohichnykh spetsialnostei) [Hygienic diagnostics of professional suitability of students of medical education institutions (on the example of dental specialties)]. Vinnytsia: TOV "TVORY"; 2020. 348 p. (Ukrainian)
10. Serheta IV, Bratkova OYu, Serebrennikova OA. Naukove obgruntuvannia hihiienichnykh pryntsypiv profilaktyky rozvytku donozolohichnykh zrushen u stani psykhichnoho zdorovia uchniv suchasnykh zakladiv serednoi osvity (ohliad literatury i vlasnykh doslidzhen) [Scientific substantiation of the hygienic principles of prevention of the development of pre-clinical changes in the state of mental health of students of modern secondary education institutions (review of the literature and own research)]. Journal of the National Academy of Sciences of Ukraine. 2022; 28(1):306-326. (Ukrainian)
11. Serheta IV, Serebrennikova OA, Stoian NV et al. Psykhohihiienichni prynpypy vykorystannia zdoroviazberihaiuchykh tekhnolohii u suchasnykh zakladakh vyshchoi osvity [Psychohygienic principles of the use of health-preserving technologies in modern institutions of higher education]. Environment and health. 2022; 2(103):32-41. (Ukrainian)
12. Tymoshchuk OV, Polka NS, Serheta IV. Naukovi osnovy kompleksnoi hihiienichnoi otsinky yakosti zhyttia ta adaptatsiinykh mozhlyvostei suchasnoi uchnivskoi i studentskoi molo [Scientific bases of a complex hygienic assessment of the quality of life and adaptive capacity of the current academic and student youth]. Vinnytsia: TOV "TVORY"; 2020. 272 p. (Ukrainian)

CONFLICT OF INTEREST
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