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EDITORIAL

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EDITORIAL

REVIEW ARTICLE

Developing an Educational, Pedagogical and Teaching Logistics System for the Higher Education Ecosystem

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A – Study design;
B – Data collection;
C – Statistical analysis;
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G – Funds collection

Abstract

Background and Aim of Study: *Contemporary realities are rapidly changing the education landscape. Developing scientific methodology, theory and technologies, including digitalisation and artificial intelligence, requires us to rethink the organisation of the educational process in terms of implementing a logistics system.*
The aim of the study: to substantiate the interconnection and mutual influence of educational, pedagogical and teaching logistics as elements of the logistics system, and to develop a model of the logistics system of developing the higher education ecosystem.

Material and Methods: *The present study employed a systems approach methodology and a complex of theoretical research methods. A modelling method was used to develop a model of the logistics system of developing the higher education ecosystem.*

Results: *The essence of the concepts of "educational logistics" and "pedagogical logistics" was clarified, and the concept of "teaching logistics" was introduced into scientific circulation. These concepts were considered for the first time as interconnected and interdependent elements of the logistics system with the possibility of integrating these elements into the higher education ecosystem. To develop the higher education ecosystem, a model of the logistics system containing educational, pedagogical and teaching logistics subsystems was created.*

Conclusions: *The developed model reflects the role of influence for resource flows in achieving the goals of the structural and functional components of the logistics system, as well as the place of stakeholders within this system and the possibilities of using artificial intelligence in each of the educational, pedagogical, and teaching logistics subsystems. Implementing a model of the logistics system of developing the higher education ecosystem will optimise and increase the efficiency of the educational process.*

Keywords: *educational logistics, pedagogical logistics, teaching logistics, interconnection and mutual influence of elements, logistics system model, higher education ecosystem*

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Introduction

Implementing a logistics system in universities significantly impacts the entire specialist training system. This logistics system enables increased efficiency and optimised operations by providing structured planning and supply chain management. This ensures that the diverse academic requirements of stakeholders are met.

This process is characterised by significant changes in pedagogical theory and practice, with the introduction of new approaches, categories and concepts.

The concepts of "pedagogical logistics", "educational logistics", "evolutionary pedagogical logistics", etc. are becoming increasingly widespread in modern scientific publications. These concepts have many formulations, depending on the characteristics on which authors base their understanding, and their vision for optimising the educational process. This situation leads to a misunderstanding of the essence of these concepts, with insignificant features being isolated and these concepts being used as synonyms.

Therefore, the current task is to distinguish between and clarify the essence of the concepts of "educational logistics", "pedagogical logistics" and "training logistics", and to determine how they are interconnected.

Analysis of contemporary scientific publications and research on educational logistics has revealed that this concept is not currently clearly defined or understood.

Educational logistics encompasses the processes, systems and information flows that facilitate the streamlining of education at universities of applied sciences, from educational development to certification. When educational institutions start to embrace flexibility and make different choices about how they organise education, this inevitably leads to changes in educational logistics (SURF, 2013b).

Skoroogatova (2010) argues that educational logistics is a branch of service logistics as a concept of managing human flows in all economic spheres, involving the management of flows of those who teach and those who learn.

According to Shevchenko (2008), educational logistics was defined as a set of principles for optimising processes within educational systems and structures.

The term "pedagogical logistics" is most commonly used in Eastern Europe.

Livshits (2007) used the terms "psychologised pedagogical logistics" and "evolutionary pedagogical logistics". In this case, evolutionary pedagogical logistics manages the flow of knowledge, evolutionary pedagogical psychology, evolutionary learning, evolutionary health, evolution, information and equipment.

Although the term "teaching logistics" appeared in English-language scientific publications (Carravilla & Oliveira, 2004), to date, only one specific definition has been introduced into scientific circulation, by Melnyk and Pypenko (2017b).

Issues related to the implementation of logistics systems in higher education were discussed in publications by Erturgut (2016) and Grala and Jałowiec (2024).

Waller et al. (2008) identified four key macro-environmental factors impacting the current state of logistics education: an increase in logistics education programmes, a limited supply of logistics-trained faculty, changes to content requirements and a changing teaching environment.

In collaboration with secondary schools in the Netherlands, research was conducted into new logistics methods to organise personalised learning. Bakir et al. (2011) argue that the data obtained in the course of logistics research can be applied in an educational context. School representatives emphasise the need for new, fundamental research into developing logistics models that prioritise people. The authors (SURF, 2013) developed a model of educational logistics through joint activities with educational institutions. They believe this model helps to make educational logistics more understandable and concrete. This model visualises the interrelationships between topics such as educational development, planning, certification and assessment. The educational logistics model enables teachers, service providers, policymakers and educational institution administrators to initiate discussions about the importance of educational logistics within their institutions, allowing them to capitalise on opportunities in this area.

Previous studies have examined the current state of digital education and learning in logistics, focusing on the integration of advanced technologies such as blockchain, virtual reality, digital twins and artificial intelligence (Abdillah & Wahyuilahi, 2025; Melnyk & Pypenko, 2020; Santhi & Muthuswamy, 2022).

Gonzalez-Mingot and Marin (2025) found that educational technology ecosystems could be employed to examine issues relating to the governance of public education and the key stakeholders in digital education. Smart logistics is changing the very concept of logistics management. Therefore, the efficiency of logistics operations in higher education can be improved by using information and communication technologies and artificial intelligence (Feng & Ye, 2021; Melnyk & Pypenko, 2025; Wang et al., 2019).

A study by Khistyeva and Pocsova (2024) examined logistics strategies that combine PUSH directive strategies, which focus on structured guidance, with PULL research methods, which focus on student initiative.

Lukman et al. (2021) analysed how sustainable development topics had been integrated into logistics-oriented curricula at European universities. In general, logistics study programmes across Europe do not offer enough flexibility to keep up with recent research and development trends, except at universities in the most developed and innovative European countries, such as Germany, Denmark and the Netherlands.

Recent findings show that the digitalisation of society as a whole, as well as the education systems being implemented in various countries, is of great importance for the development of the higher education ecosystem (Degen et al., 2025; Pypenko & Melnyk, 2021; Siyal, 2025; Xalxo et al., 2025).

The situation caused by COVID-19 has been found to have had a significant positive impact on the digitalisation of higher education and all its stakeholders (Komljenovic et al., 2025; Melnyk et al., 2022; Mifsud & Orucu, 2025).

Wu et al. (2025) have studied the use of artificial intelligence (AI) in the educational ecosystem for analysing stakeholder activities.

Nguyen (2025) examined how AI should be integrated into higher education, and which ethical and pedagogical principles should guide its use by educational stakeholders.

The study by Baig and Yadegaridehkordi (2025) examines how education stakeholders behave with regard to the ongoing use of GenAI systems in higher education, and evaluates their satisfaction with these systems.

An analysis of previous studies indicates that AI is becoming a revolutionary factor in the developing of higher education (Melnyk & Pypenko, 2024). Not only can AI improve learning outcomes, it can also improve the management of educational resources (Khan et al., 2025). This could help ensure the long-term sustainability of higher education.

Several studies have demonstrated the widespread use of AI in predicting and influencing students' academic performance (Johora et al., 2025; Merino-Campos, 2025).

Certain publications have largely indicated that training specialists at universities based on the implementation of logistics potential can not only improve the quality of education and prepare more competent specialists in the field of logistics, but also contribute to bringing university educational models into line with industry requirements (Drejeris et al., 2024; Liu, 2024; Melnyk & Pypenko, 2017a; 2020; Pacheco-Velazquez et al., 2025).

We believe that utilising the potential of stakeholders and incorporating AI into the logistics system will improve planning and management efficiency, thereby enhancing the synergistic effect.

Therefore, there is a need to substantiate a model of a logistics system for the development of the higher education ecosystem, in which stakeholders and AI should be represented in all elements of the logistics system.

Modern higher education institutions actively use AI-based models in their development and application (Aiwa & Hongwei, 2024). Using such models significantly increases students' interest in and engagement with learning, and contributes to their success.

Rodrigues et al. (2025) investigated the possibilities of modelling reduction scenarios and managing logistics costs in higher education institutions. They highlight the significant potential of these models when accounting for the variations that comprise the system.

Logistics models, such as logistics business process models, logistics system models, logistics flow models, logistics chain models and logistics regression models, are widely used in many different areas of human activity. However, at the present stage, the logistics model (logistics system model) in higher education has not yet been developed, substantiated, or empirically tested.

The aim of the study. To substantiate the interconnection and mutual influence of educational, pedagogical and teaching logistics as elements of the logistics system, and to develop a model of the logistics system of developing the higher education ecosystem.

Materials and Methods

The present study employed the systems approach methodology, as well as the following theoretical research methods: deduction and induction; analysis and synthesis; abstraction; comparison; generalisation; systematisation.

The modelling method was used to develop a model of the logistics system for the higher education ecosystem developing.

Results and Discussion

An analysis of scientific publications revealed that the term "pedagogical logistics" does not have an established definition. Furthermore, it has been replaced by other concepts, such as "educational logistics", "psychologised pedagogical logistics", "evolutionary pedagogical logistics", etc. We believe that some of these terms are more "high-ranking", and that others are derived from them. Additionally, these concepts are closely interrelated in terms of their characteristics, which scientists sometimes interpret based on the paradigms and concepts of their research. This caused considerable confusion regarding their essence, hindering their further categorisation.

As pedagogical logistics is emerging as an in-demand interdisciplinary field of study in various areas of education, it is important to distinguish and clarify the essence of these concepts.

The conceptual and terminological apparatus of pedagogical logistics as a scientific direction began to take shape at the beginning of the first decade of this century and is still being formed. Today, it is based on concepts borrowed from scientific fields such as pedagogy (education, pedagogical system, pedagogical technology, etc.), psychology (motivation, attitude, action, etc.), economics (logistics, marketing, etc.), and management (organisation, management, etc.).

The term "pedagogical logistics" consists of two term-elements, and, in terms of content, it should be broken down into several concepts. The main concepts of pedagogy are upbringing, teaching, developing and education.

The etymology of the word "pedagogy" has ancient Greek origins (paidos – child and iago – to lead, to educate).

The word "pedagogue" (paidagōgos – educator, mentor) means a person who has special training and is engaged in teaching and educational work; a teacher or lecturer.

The etymology of the word "logistics" also comes from ancient Greek (logos – mind; log – thinking; logo – to think, to reason; logismos – calculation, reflection, plan; logistea – the art of practical calculation), meaning "the art of reasoning, calculating".

Analysing the concepts of "pedagogy" and "logistics" enabled us to identify their essential features, based on which the concept of "pedagogical logistics" was clarified.

Pedagogical logistics is a branch of pedagogy that reveals tactics for taking into account the interaction of resources and the realisation of management models aimed at optimising and improving the effectiveness of the educational process.

In defining the essence of the concept of pedagogical logistics, we firstly considered the laws of logic in systematisation and secondly took into account "lexical" factors in unification.

The parameter of term formation (derivation) also becomes important when clarifying the concept. This is the ability to form concepts (terms) of subsequent levels, higher and lower in rank, from a concept (term) of the same rank and level.

So, we have identified the essential and non-essential features of the concept of pedagogical logistics. The essential generic feature is "a branch of pedagogy", the essential distinctive feature is "that reveals tactics for taking into account the interaction of resources and the realisation of management models", and the non-essential features are "aimed at optimising and improving the effectiveness of the educational process". The identified non-essential features of this concept open up prospects for researching numerous ways and conditions to optimise and improve the effectiveness of the educational process.

It should be noted that, unlike all existing definitions of pedagogical logistics, we are the first to consider this concept as interrelated and interdependent with educational and teaching logistics. Together, these three elements constitute the logistics system. This will enable these subsystems to be integrated into a more global higher education ecosystem.

We believe that the concept of "educational logistics" ranks higher than the concept of "pedagogical logistics". Following the above laws of logic in organising and constructing the concept, we will give it a definition.

Educational logistics is the field of education that determines the overall strategy for its purpose, forecasting and developing, its specific projecting and planning, predicting results, as well as setting standards that fit educational goals.

We believe that teaching logistics is a lower-ranking concept than pedagogical logistics. As this term had not been used in any publications prior to our study (Melnyk & Pypenko, 2017a), we will define it.

Teaching logistics is a method of organising teaching that reflects the process of mastering teaching material within a subject, topic or issue; requires special organisation for the content, forms and methods of teaching.

Examples of educational logistics include the concept of education, the educational system and educational technology.

Examples of pedagogical logistics include the model of personality-oriented teaching, modular or problem-based learning, etc.

Examples of teaching logistics include specific forms, methods and techniques for organising teaching to ensure the effective assimilation of curriculum material on a subject, topic or issue, such as: "Lesson – immersion in the culture of the era ...", "Seminar – theoretical conference", etc.

Figure 1 shows the interconnection and mutual influence of educational, pedagogical and academic logistics as elements of the logistics system for developing the higher education ecosystem.

Figure 1

The Interconnection and Mutual Influence of Educational, Pedagogical and Academic Logistics as Elements of the Logistics System

Note. The dotted lines represent the mutual influence of elements of the logistics system, which are interconnected and influence each other.

Therefore, educational logistics is the foundation for pedagogical and teaching logistics. Educational logistics determines the overall strategy for appointments, forecasts developments, provides designs and plans, predicts results and establishes educational standards. Pedagogical logistics reflects the educational and

management processes within an educational institution, combining the content, forms and means of each process. This allows it to be a link between educational standards and strategies, and the specific method that a teacher/lecturer uses in their teaching activities.

The concepts discussed and clarified above represent a synthesis of achievements in pedagogy, logistics, economics, marketing and other sciences generated by social and technical progress. The concepts we have presented should not be regarded as dogma. They are one of the options that require a creative approach, involving comparison with your own knowledge and experience.

After examining the various concepts of "educational logistics", "pedagogical logistics" and "teaching logistics", we have developed the following conceptual models to define them:

- "educational model";
- "psychological and pedagogical model";
- "biosocial model";
- "cybernetic model";
- "information model".

Research on this topic has enabled us to formulate theoretical and methodological requirements for implementing a logistics system of developing the higher education ecosystem:

- systematicity (the logistics of the higher education ecosystem should have all the characteristics of a system);
- logicality (interconnection and subordination of all its components);
- integrity (unity and interdependence of all its components);
- efficiency (the ratio of resources spent to results obtained);
- optimality (correspondence of tasks to conditions);
- manageability (the ability to manage results during implementation);
- reproducibility (the possibility of application by other entities).

In accordance with the clarifications made, and to substantiate the content and direction of resource flows within the higher education ecosystem, we will now consider the components of resources.

- *Information resources*: a combination of information (data) that comes to higher education institutions from the surrounding environment, accumulates in the internal environment, as well as the possibility of disseminating information about higher education institutions in society (media, information packages, etc.).
- *Financial resources*: the state of the assets and liquidity of institutions in the higher education ecosystem.
- *Human resources*: the qualifications and adaptability of academic and teaching staff at higher education institutions to the demands of society.
- *The resources of the organisational management structure:* the character and flexibility of the leadership of institutions in the higher education ecosystem, the speed of management influence.
- *Technical and technological resources:* educational opportunities and their characteristics within institutions of the higher education ecosystem, and the availability of equipment, technologies and scientific achievements.
- *Spatial resources*: the territory of institutions in the higher education ecosystem, the location of lecture halls, laboratories, libraries, and so on, as well as the possibility of expanding them.

In logistics, the following types of resource flow are distinguished:

- depending on the type of systems connected by the flow: horizontal and vertical;
- depending on the place of passage: external and internal;
- depending on the direction in relation to the logistics system: incoming and outgoing;
- depending on the type of information carrier: paper, electronic, mixed;
- depending on density: low-intensity, medium-intensity, high-intensity;
- depending on frequency: regular, operational, random, online, offline.

The flow of information resources may precede the flow of other resources (financial, technical, technological, labour, etc.), proceed simultaneously with them, or follow them.

At the same time, the information flow can be directed both in one direction with other resource flows and in the opposite (counter) direction:

- The advance information flow in the opposite (counter) direction usually contains information about the demand for higher education specialists in society.
- The advance information flow in the direct direction provides advance notice of available specialist training in a particular field.
- Information about the quantitative and qualitative parameters of the flow of financial, labour, technical, technological and other resources is transmitted directly alongside the flow of these resources.
- Following the flow of resources in the opposite (counter) direction, information may be shared about the number of applicants enrolled and young specialists graduating, in terms of quantity and/or quality.

In logistics systems, the flow of resources often runs ahead of or falls behind that of other resources. These flows also have a specific vector correspondence feature: they can be either unidirectional or multidirectional.

Due to the variety of elements involved, resource flows can be considered complex, interconnected systems.

The following parameters should be introduced into the resource flow system: time, space, quantity, quality, form and value.

The processes of transforming resource flows in response to changes in parameters such as space, time, form and properties can be considered the implementation of a set of logistical functions. Conversely, implementing logistics functions achieves the necessary transformation of resource flows in terms of their spatial, temporal, qualitative and other characteristics.

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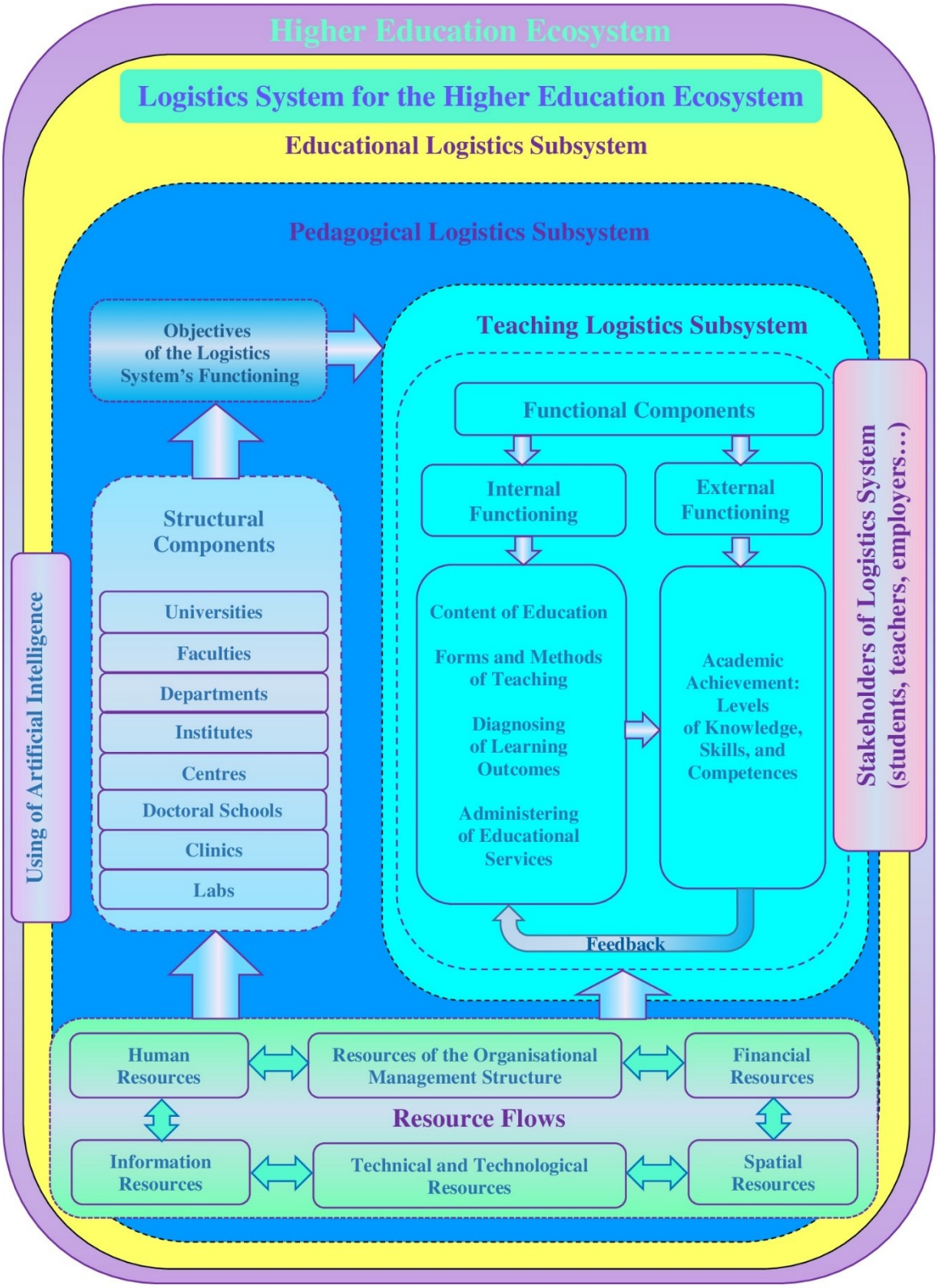
In order to comply with the principles of management and optimise resource flows within the subsystems of the logistics system, new methods and criteria must be developed to evaluate their performance. The degree of consistency between different flow processes largely determines the level of efficiency of the logistics system in the higher education ecosystem as a whole.

This allows us to develop a model of the logistics system of developing the higher education ecosystem (Figure 2).

Figure 2

A Model of the Logistics System of Developing the Higher Education Ecosystem



Taking a systems approach to substantiating the model of the logistics system of developing the higher education ecosystem has enabled us to identify three subsystems: educational logistics, pedagogical logistics, and teaching logistics.

Using a systems approach methodology to substantiate this model allowed us to identify the structural and functional components in these subsystems that are based on similar components of the model of higher educational ecosystem (Melnyk & Pypenko, 2025).

The pedagogical logistics subsystem is represented by structural components (universities, faculties, departments, institutes, centres, etc.). The entities of this subsystem have objectives that are implemented in the teaching logistics subsystem with the involvement of stakeholders.

The stakeholders in the logistics system of the higher education ecosystem may include students, teachers and employers (Melnyk et al., 2015; Pypenko et al., 2020).

The teaching logistics subsystem is represented by functional components, which are divided into two groups: internal functioning and external functioning.

The internal functioning components include educational content, teaching methods and forms, the assessment of learning outcomes and the administration of educational services.

External functioning components include academic achievements, such as levels of knowledge, skills, and competencies.

There are both direct and indirect (feedback) relationships between functional components. This makes the process more flexible and manageable, enabling you to achieve the intended outcome of operating the logistics system.

Using artificial intelligence can increase the effectiveness of implementing this model in practice.

The logistics system of developing the higher education ecosystem is significantly influenced by information resources, financial resources, human resources, spatial resources, technical and technological resources, and the organisational management structure (resource flows).

These resources are the basis and driving force for the implementation of a logistics system of developing the higher education ecosystem.

Conclusions

Based on the analysis of contemporary scientific publications and research on pedagogical logistics, the essence of the concepts of “educational logistics” and “pedagogical logistics” was clarified, and the concept of “teaching logistics” was introduced into scientific circulation. Unlike all existing studies to date, these concepts were considered for the first time as interconnected and interdependent elements of the logistics system with the possibility of integrating these elements into the higher education ecosystem.

The term “teaching logistics” was introduced into scientific circulation, and the essence of this concept was defined – a method of organising teaching that reflects the process of mastering teaching material within a subject, topic or issue; requires special organisation for the content, forms and methods of teaching.

The interconnection and mutual influence of educational, pedagogical and training logistics as elements of the logistics system were substantiated.

The following conceptual models were proposed to define these concepts: “educational model”, “psychological and pedagogical model”, “biosocial model”, “cybernetic model”, and “information model”. This opens up prospects for further theoretical and methodological research into numerous means and conditions for optimising and improving the effectiveness of the educational process.

Theoretical and methodological requirements for implementing a logistics system of developing the higher education ecosystem were formulated.

The composition of the logistics system's resource flow (including labour, information, organisational management structure, technical and technological resources, and spatial and financial resources) was established and characterised. The types and directions of resource flow were identified in order to optimise the use of all types of resource. This made it possible to substantiate a model of the logistics system of developing the higher education ecosystem.

The developed model includes subsystems of educational logistics, pedagogical logistics and teaching logistics. This model reflects the role of influence for resource flows in achieving the goals of the structural and functional components of the logistics system, as well as the place of stakeholders within this system and the possibilities of using artificial intelligence in each of the educational, pedagogical, and teaching logistics subsystems. Implementing a model of the logistics system of developing the higher education ecosystem will optimise and increase the efficiency of the educational process.

The present study does not cover all aspects of the issue of implementing a logistics system for the higher education ecosystem. Further research should focus on developing strategies and technologies to implement a logistics system across the various levels of the higher education ecosystem.

Ethical Approval

Research procedure used in the study is approved by the Committee on Ethics and Research Integrity of the Scientific Research Institute KRPOCH (protocol no. 026-3/SRIKRPOCH dated 10.08.2024).

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REVIEW ARTICLE

The Educational Mission of Health Culture as a Cultural Universal

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A – Study design;
B – Data collection;
C – Statistical analysis;
D – Data interpretation;
E – Manuscript preparation;
F – Literature search

Abstract

Background and Aim of Study: *As a complex interdisciplinary entity, the phenomenon of health culture is linked to a wide range of scientific disciplines, as well as various categories and concepts. However, the problem of defining the place of the concept of "health culture" within the system of cultural universals, and the relationship between its components, remains unresolved. Additionally, it is important to consider the opportunities for forming a health culture, both personally and within society.*

The aim of the study: to explore the phenomenon of "health culture" as a cultural universal, to characterise the educational mission of health culture and to reveal ways of forming a personal health culture in an educational environment.

Material and Methods: *The present study summarises the author's experience of researching health culture over more than 20 years. It covers the theoretical foundations and practical aspects of this phenomenon, focusing on the possibilities of forming a personal health culture in an educational environment through a socio-pedagogical system. The methodology of the system approach has been applied to the concept "health culture", as well as a set of theoretical research methods: deduction and induction, analysis and synthesis, abstracting, comparison, generalisation, systematisation, interpretation of the results.*

Results: *In this study, health culture is characterised as a cultural universal for the first time. The main methodological approaches to defining "culture" and its relationship with health culture were analysed. The connection between the definition of health culture and other concepts was determined. The structure of the hierarchy of cultural types within the concept of a universal health culture was characterised. A model of health culture of personality, as well as a model for forming a culture health of personality in the system of socio-pedagogical activity were developed.*

Conclusions: *The educational mission of health culture is to promote the harmonious development of the individual and their conscious and responsible attitude towards their physical, mental, social and spiritual health and that of society. It also involves transferring knowledge and developing key competencies in maintaining and strengthening health, establishing moral values, preserving national traditions, satisfying cultural needs and developing human potential for the benefit of the individual, their family and society. As open social systems, educational systems have the greatest potential for forming a culture health of personality. The socio-pedagogical system proposed by the author for forming a health culture of personality in educational environments has proven highly effective. The results of empirical studies provide evidence for this.*

Keywords: *health culture universal, types of culture, health culture of personality, educational mission of health culture, system of social and educational activities*

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Introduction

The phenomenon of health culture is a complex interdisciplinary construct with connections to a wide range of scientific disciplines, various categories and concepts.

The scientific literature defines the essence of the concept of "culture" and explores its philosophical aspects (Eshich, 1984; Florenskij, 2017; Freud, 1924; Gurevich, 2001; Kroeber & Kluckhohn, 1952; Stepin, 2003). The relationship between culture and health has also been examined (Bertalanffy, 1959; Fromm, 1930; Horney, 1994; Maslow, 1961; Melnyk, 2005; Rerih, 1992), as has the concept of "health culture" (Gorashchuk, 2003; Melnyk, 2002; Shakhnenko, 2002; Skumin, 1995; Svyrydenko, 2000).

However, the issue of defining the place of the concept of "health culture" in the system of cultural universals, and how its components are interrelated, remains unresolved. It is also important to consider the possibilities of forming a health culture.

The aim of the study. To explore the phenomenon of "health culture" as a cultural universal, to characterise the educational mission of health culture and to reveal ways of forming a personal health culture in an educational environment.

Materials and Methods

In this paper, we summarise over 20 years of our own research experience into health culture, focusing on both the theoretical and applied aspects of the phenomenon. We also explore the possibilities for forming a health culture in educational environments.

The present study employed the system approach methodology, as well as the following theoretical research methods: deduction and induction; analysis and synthesis; abstraction; comparison; generalisation; systematisation; and interpretation of results.

Results and Discussion

The term "health culture" is a two-part term (term-phrase) whose components have independent meanings. This requires us to consider the definitions of "culture" and "health".

Numerous definitions of the concept of culture can be found in scientific publications on philosophy, sociology, cultural studies, psychology and pedagogy.

The concept of "culture" first appeared in the study "De jure naturae et gentium" (1672) by the German lawyer and historian Samuel von Pufendorf. This scientist used this term to refer to a person who was raised in society (artificial man), as opposed to a person who was not educated (natural man).

By the end of the 20th century, more than four hundred different definitions of culture had already been recorded (Polishhuk, 1993).

In 1952, Kroeber and Kluckhohn attempted to classify definitions of culture, dividing them into ten groups. The first group contains descriptive definitions. The second group emphasises the importance of social heritage and traditions, pointing out that culture is a socially inherited set of practices and beliefs that determines the foundations of our lives. The third group highlights the importance of rules that promote a certain way of life for culture. It is also important to consider the group in which culture is directly linked to the process of learning and education. This classification highlights the multifaceted nature of this definition, enabling us to identify different aspects when studying the phenomenon of culture and, subsequently, health culture.

In education, the importance of cross-cultural perspectives is ever-growing. Multi-, inter- and/or transcultural perspectives help us to understand our own and other cultures (Nieke, 2008).

Based on an analytical grid, Köpfer and Proyer (2025) identified certain formations of how culture is articulated in relation to education: culture as a national reference; culture as a cultural-historical process and practice; culture as a group; culture as a system of production and representation.

In order to analyse them and identify the main approaches, let us consider several common interpretations of culture.

Culture is a system of supra-biological programmes that govern human behaviour and communication. These programmes are historically developed and are a prerequisite for the reproduction and change of social life in all its main manifestations. This definition emphasises that culture is a supra-biological system of activity that is transmitted historically in the social experience of humanity. This definition of culture is primarily found in philosophical and encyclopaedic dictionaries. This view is typical of philosophers, educators, and other scholars who emphasise the importance of social factors.

Here are some common definitions. Culture is the totality of a society's practical, material and spiritual achievements, reflecting its historical development and the results of its productive activity. Culture is a concept that reflects the symbolic, non-biological, i.e. acquired, aspects of human society.

However, it should be noted that there is also an opposing view in psychology, particularly among psychoanalysts.

Culture, in particular, is the sum total of the achievements and institutions that distinguish our lives from those of our animal ancestors, serving the purposes of protection from nature and the regulation of relationships (Freud, 1924). According to Freud, culture is not the result of social progress, but rather a product of biological instinct.

So, not only do scientists' understandings of the concept of culture differ in essence, they also point to the existence of diametrically opposed views.

Consequently, the concept of "culture" needs to be analysed in more detail to further substantiate the essence of "health culture".

One of the most obvious ways to analyse the concept of "culture" is to consider it within the context of fundamental philosophical approaches as a cultural universal.

Gurevich (2001) identified the following "specific approaches": philosophical-anthropological, philosophical-historical, and sociological.

The philosophical-anthropological approach considers culture to be an expression of human nature, evaluating it as a comprehensive phenomenology of humanity. A consistent philosophical-anthropological approach to culture is rarely used. This is related to the understanding of the phenomenon of culture, which cannot be derived from the biological nature of humans.

The philosophical-historical approach aims to reveal the mechanisms behind the emergence of human history itself. Based on the philosophical idea of anthropology, this approach is often referred to as "activity-based".

The sociological approach interprets culture as a factor in the organisation and way of life of any society. This approach is based on two premises: first that every society has its own culture; and second that every person is cultural, in the sense that they live in one culture or another.

An analysis of publications on this topic reveals that researchers attempting to define culture have done so within the aforementioned approaches. This is primarily because of their approach to studying the phenomenon of culture.

Exploring the essence of the concept of "culture", Hrynova (1998) argues that "since it is practically impossible to exhaust all aspects of culture, none of the existing approaches can claim to formulate an exhaustive definition of it". We agree with this opinion. Therefore, rather than clarifying the concept of "culture" itself, it is necessary to clarify the approaches, concepts and paradigms within which the concept of "health culture" will be considered.

Eshich (1984) identified seven main types of cultural concept: object-value, activity-based, personality-attributive, social-attributive, information-symbolic and system-forming subsystems of society. We believe that all of the above cultural concepts can be used to some extent as they are all relevant to the concept of "health culture". However, new views on the classification of cultural concepts and ideas have emerged at the beginning of the 21st century.

Among existing approaches to the classification of cultural concepts and ideas, Stepin's (2003) study should be considered. Stepin (2003) observed that, despite their dynamism and relative independence, cultural phenomena at all levels are organised into a coherent system, with the fundamental principles of each culture serving as the system-forming factor. They are represented by worldview universals, or categories of culture. These interact and interconnect to form a holistic, generalised image of the human world.

According to Brown (1991; 2000), human universals are features of culture, society, language, behaviour and psychology that are found throughout the world in every cultural group and for which there are no known exceptions. He identified hundreds of universal concepts, which he divided into several groups including language, cognition, society, beliefs and technology. These probably included human characteristics, traits and behavioural patterns that are of significant value for survival and evolutionary adaptation.

Brown (2004) observed that universal human concepts in the cultural sphere include legends, myths, everyday life, rules and body adornments, among others.

In the social sphere, universals include the division of labour, social groups, age classification, the family and kinship systems, and cooperation.

In the sphere of the psyche, universals include thinking, emotions and fear, as well as psychological defence mechanisms.

In the behavioural sphere, universals include gestures, aggression and facial expressions.

It should be noted that there are many universal concepts that are difficult to classify for a particular specified area. This is because they can be interpreted simultaneously as social, cultural and linguistic. For example, turn-taking in conversation is simultaneously a linguistic, social, and behavioural universals.

Some anthropologists question the existence of cultural universals, instead adhering to the viewpoint of cultural relativism. Cultural relativism suggests that behaviour and beliefs should be understood in relation to an individual's own culture rather than being compared with the criteria of other people, groups, or society as a whole, since significant differences in perceptual abilities and reasoning strategies exist among different cultural groups (Cordaro et al., 2018; Floyd et al., 2018). We believe this perspective is important for distinguishing between the various levels of health culture. However, it should also be borne in mind that there are stable cross-cultural universals, regardless of cultural differences.

The most significant finding of the present study is that there are cross-cultural similarities in the way that perceptual experience is conceptualised.

Stepin (2003, p. 528) identified two large, interrelated blocks of cultural universals. These blocks are always mutually correlated, expressing the connections between subject-object and subject-subject relationships in human life.

The first block of cultural universals includes categories that encapsulate the most common, attributive characteristics of objects involved in human activity. The following categories are used to record their attributive characteristics: "activity", "content", "quantity", "measure", "time", "movement", "relation", "randomness", "necessity", etc.

The second block of cultural universals encompasses categories that, in the most generalised form, capture the historically accumulated experience of an individual's inclusion in systems of social relations and communication. It includes categories such as "knowledge", "beauty", "freedom", "conscience", "duty" and "society", among others.

Analysing the phenomenon of culture in accordance with the two blocks of universals presented above has enabled us to identify the main approaches and paradigms through which we believe the phenomenon of "health culture" should be considered.

Let us take a closer look at one aspect of understanding culture that is directly relevant to clarifying the essence of the "health culture" phenomenon. In this context, culture is defined as the sum total of society's achievements, as something man-made, created by humans.

This is a traditional philosophical view, in which culture is understood as "second nature".

Gurevich (2001) observed that there are clear contradictions in the traditional view of culture as "second nature". By interpreting culture as something superimposed on nature, researchers have created a sense of mutual alienation. The following paradoxical line of thought arises: in order to create culture, one must be as far removed from nature as possible. Does this view of cultural creativity lead to a predatory and destructive attitude towards nature? Above all, culture is a natural phenomenon because its creator, humans, are biological creatures.

Florensky (2017) believed that culture and nature do not exist in isolation from each other. In other words, they co-exist because culture has never been given to us without its own natural foundation, which serves as its environment and material. Every cultural phenomenon is rooted in a natural phenomenon that has been shaped by culture. As a bearer of culture, humans do not create anything; they only shape and transform what is already there.

We agree with Gurevich, Florensky and others that there is an interconnection between culture and nature. We therefore consider it appropriate to apply this thesis when defining health culture.

Questions may arise about the relationship between culture and health, and how they can become disconnected from each other.

It is worth mentioning the humanistic psychologists who were wary of culture. Maslow (1961) suggested that a sign of a healthy individual is the ability to resist "acculturation", or the defence of one's own developmental tendencies against cultural influences.

For the same reasons as culture and nature, we believe that culture and health are also dialectically interrelated, if health is understood as something that is potentially given to us from birth (we mean not only physical condition, but all spheres of human existence), i.e. something natural, and culture is understood as the totality of social achievements, i.e. something man-made.

The configuration of diverse knowledge and views on culture and health indicates that there is a close connection and interdependence between culture and health.

Analysing publications in philosophy, sociology, cultural studies, medicine, psychology, and pedagogy allows us to examine the views of scholars on the role of culture in preserving and strengthening personal health.

The interconnection and interdependence between culture and health is reflected in publications by educators, psychologists, psychiatrists, medics, physiologists, sociologists, cultural scholars, and other scientists (Bertalanffy, 1959; Fromm, 1930; Horney, 1994; Maslow, 1961; Melnyk, 2005; Roerich, 1992; Skumin, 1995).

Representatives of neo-Freudianism, such as Fromm (1930) and Horney (1994), identified the origins of culture's negative impact on mental health. They believe that neuroses are caused not only by individual experiences, but also by the specific cultural conditions in which a person lives.

Horney (1994) emphasised the importance of the family atmosphere in which a child grows up. She highlighted cultural conditions that produce neurosis, namely specific factors in the child's environment that inhibit their mental development.

Bertalanffy (1959) emphasised that a person's health depends on the culture in which they are raised and live. He noted that culture is not just a toy for humans as animals, or a luxury for the intelligentsia. It is the true backbone of society and an important psychohygienic factor, among other things.

The connection between culture and health is a theme that Helena and Nicholas Roerichs repeatedly highlight in their publications. Roerichs (1992) noted that physical exercise outdoors is certainly beneficial to a certain extent.

However, healing the body requires a more caring approach than merely regulating the stomach or participating in primitive and often one-sided sports. Human beings are drawn to culture.

Considering the essence of health and culture, Roerichs asserted that if they were told they cared only about the spiritual realm when discussing culture, they would respond, "No, we also care about the body, so that it is truly healthy and in line with the requirements of true culture." In other words, Roerichs pointed to the synthesis of the concepts of health and culture, body and spirit. Bright minds call for creative synthesis, in which the old adage "in corpore sano mens sana" takes on special significance, and one can truly understand that a pure creative spirit is the inhabitant of a pure, healthy body.

Skumin (1995) shared this opinion, noting that health culture is a creative synthesis of the lofty concepts of culture and health. He added that the development of the world-bearing, spiritual principle as a truly human quality is the only way to achieve spiritual and human health, rather than animalistic health.

We consider culture and health to be two interrelated phenomena because humans create a health culture, which creates the preconditions for human development and the preservation and strengthening of health. Therefore, an individual's health depends directly on their personal level of culture, particularly health culture, which is the foundation for their further development at all levels.

Previous studies (Melnyk, 2002; 2004a; 2004b; 2005) have thoroughly examined the connection between the definition of health culture and related concepts such as physical, psychological, social and spiritual culture, and physical, mental, social and spiritual health.

These are all components of an individual's health culture (Figure 1).

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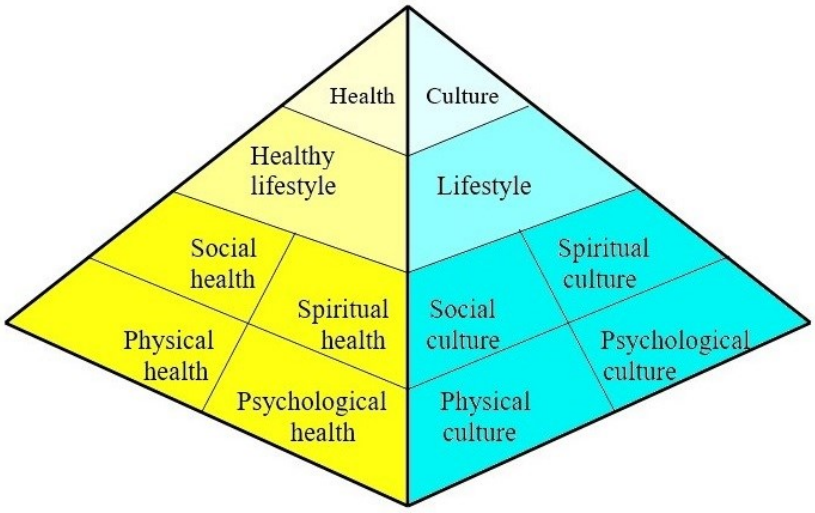
Figure 1

Connection between Definition of Health Culture and Other Concepts



Analysing the definitions of "culture" and "health", comparing and contrasting them, clarifying their content and interrelationship, and analysing the definition of "health culture" allows us to identify the paradigms ("human-oriented" (anthropological) and "knowledge-based") within which the phenomenon of "health culture" is considered. Based on these paradigms, we will classify the above definitions of "health culture" and identify the essential aspects of the concept.

Within the "knowledge-based" paradigm, Skumin (1995) and Shakhnenko (2002) provided definitions of "health culture", as did Gorashchuk (2003) and Svyrydenko (2000) within the "human-oriented" paradigm.

It should be noted that the essence of health culture is paradigmatic, indicating the possibility of using multiple paradigms to study this phenomenon. Taking this aspect of the "health culture" phenomenon into account ensures the objectivity of research into its essence, as well as the validity of models, technologies, etc.

Therefore, it is necessary to specify research paradigms and conduct an aspectual analysis of the concept of health culture, clarifying its essential characteristics. It is also necessary to identify aspects of studying this phenomenon in accordance with the scientific field and research problem.

The above paradigms, which scientists have used to study the phenomenon of health culture, should not be opposed, but rather combined. In the present study, we rely on both paradigms: the "knowledge-based" paradigm is used to clarify the meaning of the concept of "health culture", while the "human-oriented" paradigm is used to define the concept of "personal health culture" and justify models, technologies and systems.

The logic behind the concept of health culture and its aspectual analysis in philosophical terms has allowed us to identify the following aspects: gnoseological, anthropological, axiological, and ontological.

The generic feature of the concept of health culture is that it is a component of human culture comprising a set of specialised knowledge and theories of cognition based on the categorical opposition of "subject–object" (the gnoseological aspect). The distinctive features of the concept of health culture are the spheres of an individual's life in both their diversity and unity (the anthropological aspect), a person's attitude towards health and life as the highest value (the axiological aspect), and an understanding of the essence of being (the ontological aspect). On this basis, we clarify and expand the essence of the concept of "health culture".

Health culture is a component of human culture that includes a totality of knowledge in the philosophical, pedagogical, psychological, and medical fields, e It enriches an individual's spiritual, social, mental and physical life, contributes to the formation of a personal attitude towards health and life, and helps a person comprehend the paradigms of existence (Melnyk, 2002). The concept is fixed and limited in meaning due to certain aspects, which is important when considering the principle of unambiguity. When analysing the concept of health culture, it is important to note that it reveals its essence adequately and logically. Firstly, we took into account the laws of logic when organising the material. Secondly, we considered "lexical" factors when unifying the material. Thirdly, we did not use borrowings from different languages. The concept of health culture is important in terms of term formation, or derivation – the ability to form concepts of a higher or lower rank from a concept of the same rank.

Analysing the concepts of health, culture and personality has made it possible to introduce the concept of "personal health culture" into scientific discourse.

Personal health culture is an integrated personal formation that determines the harmonious development of all components of the human personality, promotes the integrity of relationships between all its spheres, and stimulates self-knowledge, self-improvement, and creative activity.

By components of human personality, we mean the physical, mental, social, and spiritual aspects of a person, and by spheres, we mean the motivational,

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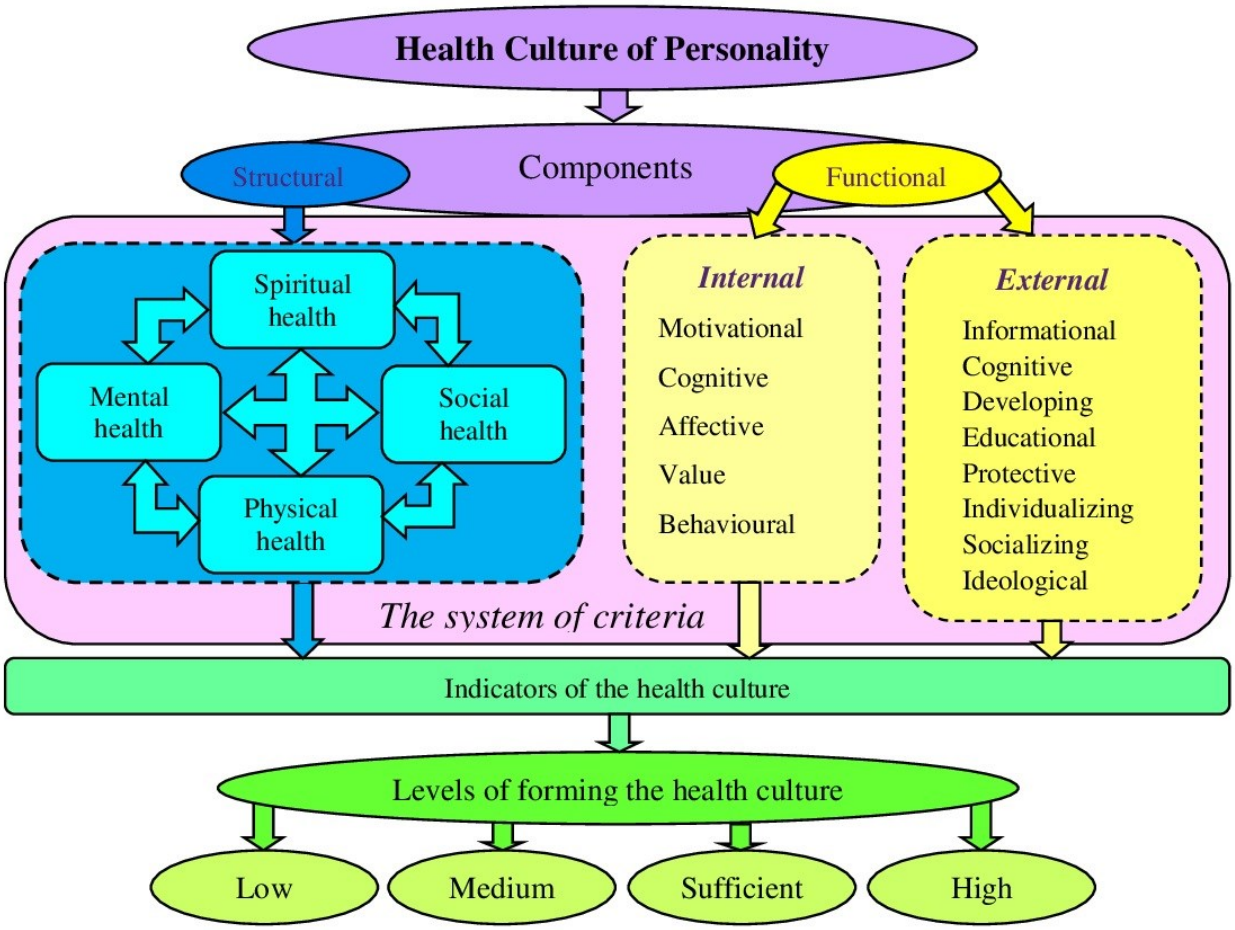
cognitive, affective, value-based, and behavioural spheres (Melnyk, 2004). This definition formed the basis for developing a theoretical model for the health culture of a personality (Figure 2), as well as its further practical application, primarily in the field of education (Melnyk, 2017; 2019).

Figure 2
The Model for the Health Culture of Personality (Melnyk, 2004b)

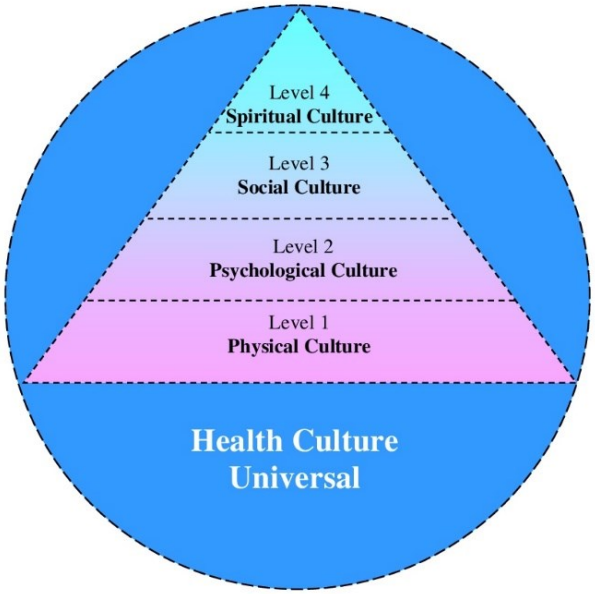


The four components of personal health culture – physical, mental, social and spiritual health – are closely interrelated. They are correlated, i.e. changes in one lead to changes in the others. For example, a person who devotes a lot of time to physical development, such as playing sports, may find that it affects their mental development. This influence can have positive or negative effects. For example, a person with the above-mentioned personality may become more determined, but experience a decline in intellectual development. In this example, we are not referring to intellectual sports. Other factors to take into account include sports, age and individual psychological characteristics.

Previous studies have described the structural scheme of the hierarchy of health components and their dialectical interrelationship (Melnyk, 2004a; 2004b; 2005).

Drawing on the main methodological and theoretical principles of these studies, and considering culture and health as interrelated phenomena, we have created a schematic representation of the hierarchical structure of types of culture within the health culture universal (see Figure 3).

Figure 3
The Structure of the Hierarchy of Cultural Types within the Universal of Health Culture



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As a cultural universal, health culture is closely linked to the most important human needs: physical (preserving life and strengthening health), psychological (developing the individual's cognitive processes), social (interacting with and building relationships with people, social structures), and spiritual (art, religion).

The specific content of a universal health culture can differ from one country or society to another. However, the education system is the one place where this universal principle is most clearly expressed in all countries and societies.

As a cultural universal, health culture has its own educational mission. The ***educational mission of health culture*** is to promote the harmonious development of the individual and their conscious and responsible attitude towards their physical, mental, social and spiritual health and that of society. It also involves transferring knowledge and developing key competencies in maintaining and strengthening health, establishing moral values, preserving national traditions, satisfying cultural needs and developing human potential for the benefit of the individual, their family and society.

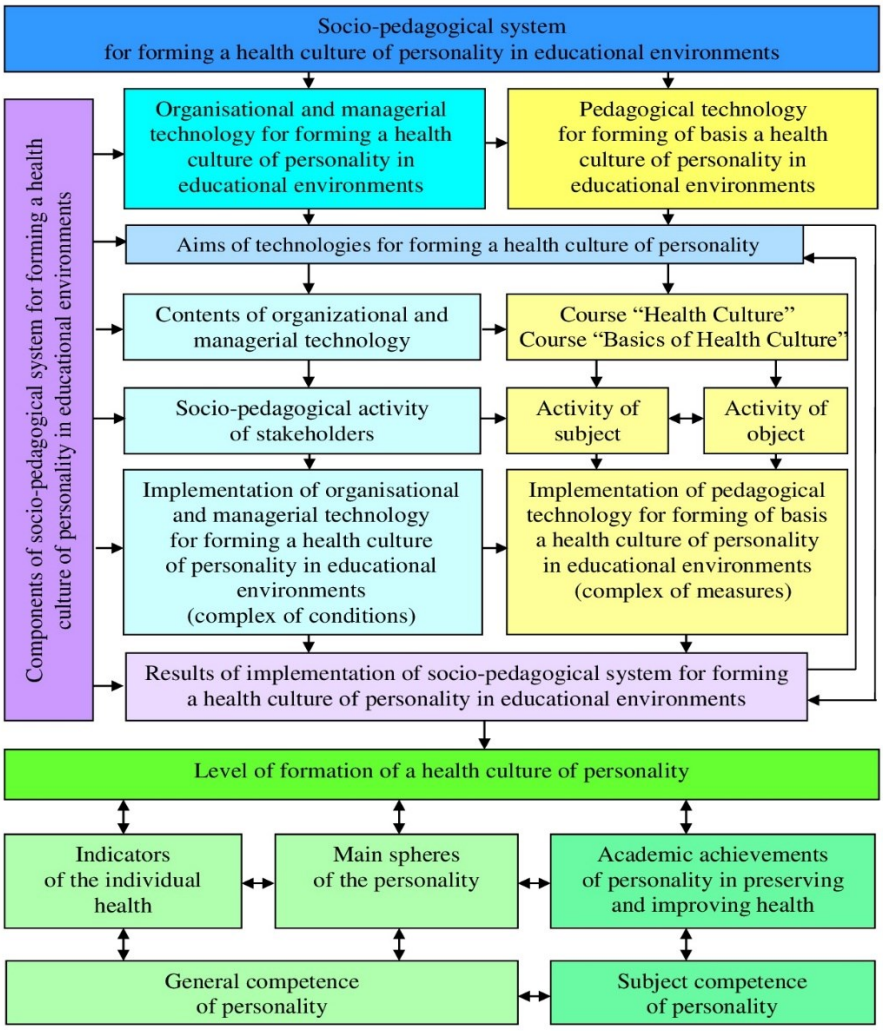
Based on theoretical and methodological developments, we expanded the conceptual and categorical apparatus and developed a ***socio-pedagogical system for forming a health culture of the individual*** – an invariant social system characterised by specially organised socio-pedagogical activities within a socio-cultural environment and ensuring the development of a health culture among individuals in accordance with their specific characteristics (age-related, individual) (Melnyk, 2008).

Creating of a socio-pedagogical system for forming a health culture among individuals required defining its components, functions, structure, level of application, etc. The socio-pedagogical system has the following levels: personal, group (class or group), educational institution level (primary, secondary, higher), educational institution type (secondary school, university), territorial community (area of residence), society (individual region), education system (state).

Thus, the theoretical and methodological justification enabled us to identify the hierarchy of levels of health culture within society, as well as the system of socio-pedagogical activities involved in the formation of personal health culture (Melnyk, 2010). In accordance with these levels, a model for the formation of personal health culture in the system of socio-pedagogical activity has been developed (Figure 4).

Figure 4

Model of Forming a Health Culture of Personality in the System of Socio-Pedagogical Activity



The model illustrates how social institutions interact within society to solve identified problems. There is an interconnection between social institutions at different levels, which ensures the integrity and purposefulness of socio-pedagogical activities in the formation of a culture of personal health.

Based on a study of publications on the application of technologies in education, an integrated socio-pedagogical technology for the formation of a health culture of the individual has been substantiated (Melnyk, 2012). This multi-level technology was implemented as an organisational and managerial tool to promote a culture of health in social and educational activities, as well as a pedagogical technology to establish the foundations of a culture of health in individuals.

The implementation of the developed technology has contributed to the introduction of educational programmes and courses on "Health Culture" in educational institutions (schools, gymnasiums, universities), "Basics of Health Culture", comprehensive targeted programmes and systems of educational work on the formation of personal health culture, methods of researching levels of health culture, etc. (Melnyk, 2012). Publications by Melnyk (2017; 2019) highlight the main provisions for implementing the socio-pedagogical system for shaping a culture of personal health, as well as the results obtained in empirical studies.

In recent years, there has been an increasing trend towards distance learning and online education (Pypenko et al., 2020). This will undoubtedly influence the development of a personal health culture, which will also contribute to this process in its own way.

However, we are unsure whether remote learning methods will have a positive impact on personal health culture.

Some authors (Jung, 2023) who have studied the influence of cultural universals and learned behavioural patterns on online learning suggest that these factors can contribute to a more multicultural and diverse experience for learners.

However, we can be absolutely certain that today's challenges, such as global pandemics and the rapid development of artificial intelligence, will increase the role of distance and online learning (Melnyk, 2020; Melnyk & Pypenko, 2024). In this new reality, the importance of health culture's educational mission cannot be overstated.

Conclusions

Thus, analysing the definitions of culture concept has enabled us to identify the peculiarities of this category, whose image has evolved historically over the centuries and continues to do so today. The concept of health culture is one element of a system of concepts closely related to physical, psychological, social and spiritual culture. Analysing the concept of health culture has enabled us to identify its essential characteristics. Identifying the links between health culture and other concepts, as well as conducting an aspectual analysis of the phenomenon, has allowed us to highlight areas for further study that will contribute to the development of methodology and the establishment of health culture as a universal cultural feature.

The theoretical and methodological foundations developed, along with the technological and methodological support, have been proven effective through experimentation and can be used to promote a culture of personal health in educational environments.

The multifaceted and multidimensional nature of the phenomenon of health culture and the new realities of distance education and online learning open up great prospects for research in this area, as well as for the establishment of the phenomenon of health culture as an independent scientific field.

Ethical Approval

The research procedure used in the study were approved by the Committee on Ethics and Research Integrity of the Scientific Research Institute KRPOCH (protocol no. 026-2/SRIKRPOCH dated 10.08.2024)

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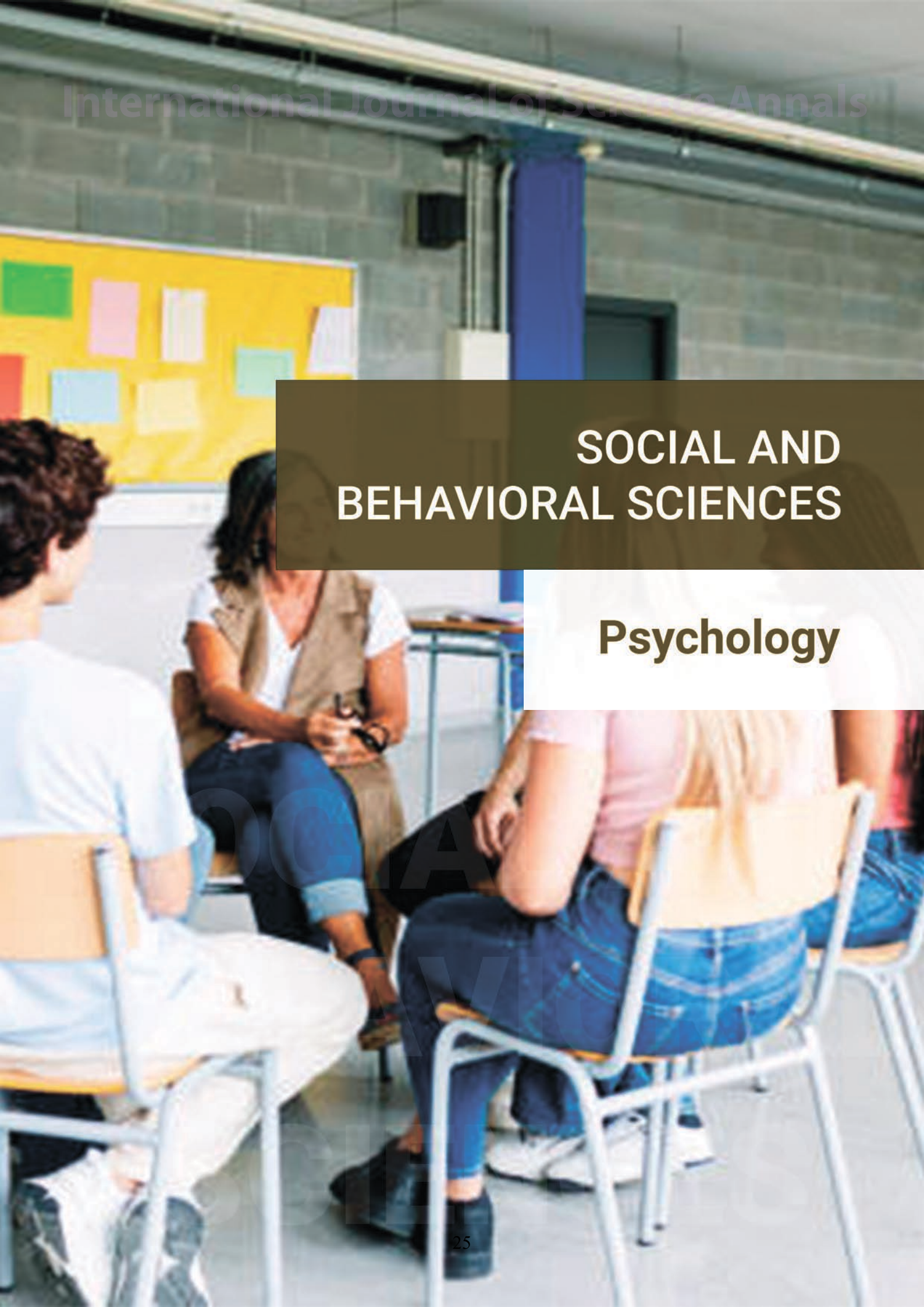

SOCIAL AND BEHAVIORAL SCIENCES

Psychology

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SOCIAL AND BEHAVIORAL SCIENCES. Psychology

ORIGINAL RESEARCH

Life Satisfaction and Psychological Resilience among University Students during Wartime

Authors' Contribution:
A – Study design;
B – Data collection;
C – Statistical analysis;
D – Data interpretation;
E – Manuscript preparation;
F – Literature search;
G – Funds collection

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Abstract

Background and Aim of Study: *The war in Ukraine is having a significant impact on the mental health of all its residents. This is particularly noticeable among young university students, who are forced to seek refuge both within and outside the country during their studies. The aim of the study: to identify the characteristics of life satisfaction and psychological resilience among university students in different learning environments during wartime.*

Material and Methods: *The study was conducted at Uzhhorod National University in Ukraine in May 2025. It used the Google Forms platform to administer two psychological tests: the Satisfaction with Life Scale (SWLS) and the Connor-Davidson Resilience Scale 10 (CD-RISC 10). Respondents aged 18–35 were divided into two groups. Group 1 consisted of 116 students, 21.6% of whom were male and 78.4% of whom were female. None of them has changed their place of residence (Ukraine). Group 2 consisted of 108 students, 19.4% of whom were male and 80.6% of whom were female. They were all forced to relocate to other regions, including Ukraine and the European Union.*

Results: *Both groups of students showed high internal consistency in their SWLS and CD-RISC 10 scores (Cronbach's alpha of 0.856 to 0.929). Students in Group 1 report levels of extreme and general dissatisfaction with life that are almost 1.4 times higher than those in Group 2. However, this indicator is significantly higher among men than women. This suggests that their psychological well-being is poor. On average, students in Group 1 are 25.5% more psychologically resilient than those in Group 2, who are 23.6% resilient. Furthermore, the proportion of students in Group 2 who have low psychological resilience is almost double that in Group 1. In terms of gender characteristics, women in Group 1 demonstrate higher levels of psychological resilience (29.7%), whereas men in Group 2 demonstrate lower levels (14.3%). These are the highest levels observed across all gender groups.*

Conclusions: *A positive strong correlation (r=0.811) has been found between psychological resilience and life satisfaction among university students during wartime, confirming high convergent validity. However, there was a significant decrease in psychological resilience among students in Group 2, who had relatively low levels of life satisfaction. Therefore, it is necessary to develop programmes that actively promote psychological intervention and social support to improve the mental well-being and learning effectiveness of university students.*

Keywords: *mental health, life satisfaction, psychological resilience, quality of life, students, war*

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Introduction

The war in Ukraine is the most challenging time in the lives of its people. Everyone in the country has been affected by the war, whether through being mobilised and participating in combat operations, losing loved ones, homes and property, or being forcibly displaced. People have suffered air raids, shelling and power shortages. Active hostilities have forced many to flee their homes and normal lives in search of refuge, both within the country and abroad. This includes university students (Melnyk et al., 2024; Mykhaylyshyn et al., 2024; Pypenko et al., 2023; Stadnik et al., 2023; 2025). Fear of death, anxiety, concern for loved ones and being forced to relocate to safer areas all negatively impact mental health and life satisfaction. Life satisfaction is essentially an attitude towards reality formed through emotions and feelings, and it has a significant impact on a person's mental health (Melnyk et al., 2025; Samir AlKudsi et al., 2022).

On the other hand, personal resilience is an important factor in the mental well-being of every university student. The APA Executive Director for Practice (Newman, 2002) defines psychological resilience as "the process of adapting and recovering when faced with adversity, tragedy, trauma, or stress". Psychological resilience is a complex concept determined by a combination of personal, social and cultural factors (Melnyk et al., 2020; Southwick et al., 2014). Recent studies (Jackson et al., 2007) have shown that resilience can be strengthened through training and education. This improves the mental health and learning effectiveness of university students during wartime.

The aim of the study. To identify the characteristics of life satisfaction and psychological resilience among university students in different learning environments during wartime.

Materials and Methods

Participants

A survey was carried out among students aged 18 to 35 at Uzhhorod National University in May 2025. The students participating in the study were divided into two groups. Group 1 consisted of 116 university students from western Ukraine who did not leave their place of residence during the war. Of these, 25 (21.5%) were male and 91 (78.4%) were female. Group 2 consisted of 108 university students who were displaced persons residing temporarily in Ukraine and European Union countries. Of these, 21 (19.4%) were men and 87 (80.6%) were women.

Due to the war in Ukraine, the study was conducted by posting psychological questionnaires on Google Forms. Additionally, all groups of university students were observed during face-to-face and online classes.

Mental Health Measures

The Satisfaction with Life Scale, a 5-item scale, SWLS (Diener et al., 1985) was used to assess students' life satisfaction and quality of life. In the present study, the adapted Ukrainian version of the questionnaire by Stadnik and Melnyk was used (https://forms.gle/9GoFoTZjWnMxrMW5A). The SWLS is designed to measure overall perceptions of quality of life. It enables respondents to rate the importance of different areas of life according to their personal values, providing an overall judgement of life satisfaction. Each of the five items is rated using a seven-point Likert scale, where 1 means "strongly disagree" and 7 means "strongly agree". Higher scores indicate greater life satisfaction. The SWLS scores showed good internal consistency. The Cronbach's alphas were 0.917 for Group 1 students (who did not leave their place of residence) and 0.856 for Group 2 students (who were temporarily displaced), respectively.

The Connor-Davidson Resilience Scale, a 10-item scale, CD-RISC-10 (Davidson, 2018) was used to assess psychological resilience, or a person's ability to recover from stressful events, tragedy or trauma. The adapted Ukrainian version of the Stadnik and Melnyk questionnaire (https://forms.gle/d1TQ17tRoSeLy7RF8) was used in the present study. This scale has strong psychometric properties and consists of ten items, each of which is rated on a five-point scale from 0 to 4. Higher scores indicate greater resilience. Possible answers include: 0 – Not true at all; 1 – Rarely true; 2 – Sometimes true; 3 – Often true; 4 – True nearly all of the time. The total score is obtained by adding together the points awarded for each of the ten items. The total score can range from 0 to 40 and is assessed as follows: 0–15 points: low level of resilience; 16–20 points: below average level of resilience; 21–25 points: average level; 26–30 points: above average level of resilience; 31–40 points: high level of resilience. The average psychological resilience score is found by taking the arithmetic mean of the total score. This scale is widely used in research and practice related to stress. The

Cronbach's alphas for this scale in the present study were 0.929 (Group 1) and 0.919 (Group 2).

Overall, the CD-RISC-10 scale indicates how well a person copes with stress, while the SWLS scale indicates their general life satisfaction. Resilience is a strong predictor of achieving this satisfaction.

The psychological methods and research procedure used in the study were approved by the Committee on Ethics and Research Integrity of the Scientific Research Institute KRPOCH (protocol no. 026-1/SRIKRPOCH dated 10.08.2024).

Statistical Analysis

All data analysis was performed using IBM SPSS Statistics for Windows (Version 30.0).

The reliability (internal consistency) of the scales was assessed using Cronbach's alpha test to evaluate internal consistency, as well as item-test correlations. Scales show good internal consistency when Cronbach's alpha is greater than 0.7. In addition, Pearson correlations were performed between all items within each scale (i.e. inter-item correlations). A value greater than 0.4 indicated that an item was measuring the scale homogeneously. Convergent validity was evaluated by correlating total scores on the Satisfaction with Life Scale (SWLS) with total scores on the Connor-Davidson Resilience Scale (CD-RISC-10). Pearson correlation coefficients were used for convergent validity.

Results

Life satisfaction is an important indicator of an individual's quality of life and psychological well-being (Stadnik et al., 2023). Table 1 shows the descriptive statistics for each life satisfaction criterion: mean, standard deviation, statistical sum and variance for Groups 1 and 2. The average score of satisfaction with life was 18.0 points (SD 6.4) for Group 1 and 16.1 points (SD 6.0) for Group 2.

Table 1

Descriptive Statistics for the Satisfaction with Life Scale Items

Items	Mean		Standard deviation		Sum		Variance	
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
Item 1	3.3	2.9	1.4	1.3	385.0	316.0	2.0	1.6
Item 2	3.5	3.2	1.4	1.2	410.0	342.0	1.8	1.4
Item 3	3.3	2.9	1.5	1.6	377.0	313.0	2.3	2.4
Item 4	4.2	4.0	1.3	1.4	483.0	436.0	1.7	1.9
Item 5	3.8	3.1	1.7	1.9	435.0	332.0	3.0	3.9
Items sum	18.0	16.1	6.4	6.0	-	-	40.7	35.7

Analysis of the SWLS reliability showed internal consistency scores of 0.917 and 0.856 for students who had not left their usual place of residence (Group 1) and those who had been temporarily displaced (Group 2), respectively.

Similarly, we confirmed that the correlation between items was significant. All items were moderately to highly correlated, with values ranging from 0.563 to 0.896 across both groups (see Table 2).

Table 3 shows the life satisfaction among university students during the wartime.

Among students in Group 1, who did not leave their usual place of residence during the war, the proportion who were extremely dissatisfied with their lives (8.6%) and dissatisfied with their lives (17.2%) were almost 40.0% lower than among those who did change their place of residence (13.0% and 23.1%, respectively). This manifested as a general sense of depression and a lack of motivation to study. It also led to problems in relationships and social situations, and to physical and emotional symptoms such as fatigue, sleep disturbances and changes in appetite. Additionally, no statistically significant difference in life satisfaction scores was found between the two groups studied (13.8% for Group 1 and 13.3% for Group 2). It should be noted that none of the students in any of the groups were completely satisfied with their lives. This indicates a notable decline in the quality of life experienced by university students during the war.

The study's gender-related findings were as follows: the proportion of men in Group 2 who were extremely dissatisfied with their lives (28.6%) was significantly higher than the proportion of women in Group 2 who were extremely dissatisfied with their lives (9.2%). This indicates constant feelings of sadness, anxiety and depression, as well as low self-esteem. It also indicates social isolation and loneliness, neglect of self-care, and feelings of hopelessness and worthlessness.

Table 2

Inter-Item Correlation Matrix for the Satisfaction with Life Scale Items

Items	Item 1*	Item 2*	Item 3*	Item 4*	Item 5*
Item 1*	-	0.744	0.733	0.673	0.734
Item 2*	0.626	-	0.694	0.538	0.696
Item 3*	0.645	0.626	-	0.667	0.733
Item 4*	0.558	0.604	0.514	-	0.712
Item 5*	0.573	0.528	0.652	0.523	-

Notes. *Correlation is significant at the 0.01 level.

Correlations for Group 1 are shown above the diagonal and those for Group 2 are below the diagonal.

Table 3

The Assessment of Life Satisfaction Levels among University Students during the Wartime

Life satisfaction level	Group 1, %			Group 2, %		
	Total	Male	Female	Total	Male	Female
Extremely dissatisfied	8.6	16.0	6.6	13.0	28.6	9.2
Dissatisfied	17.2	12.0	18.7	23.2	14.3	25.3
Slightly dissatisfied	29.3	28.0	29.7	22.1	14.1	24.1
Neutral	6.1	8.0	5.4	2.8	4.8	2.3
Slightly satisfied	25.0	24.0	25.3	25.9	23.8	26.5
Satisfied	13.8	12.0	14.3	13.0	14.3	12.6
Extremely satisfied	0.00	0.0	0.0	0.00	0.00	0.00
Total	100.0	100.0	100.0	100.0	100.0	100.0

Thus, life satisfaction is an integrative characteristic of an individual's living conditions. It is manifested as their perception of, and attitude towards, changes in life, and it determines their personal satisfaction with life. It may manifest as dissatisfaction with activities, relationships, or general well-being. War is a powerful factor that negatively impacts life satisfaction.

The present study showed that living in safe conditions, even abroad, does not necessarily lead to high life satisfaction. University students who are internally displaced persons and reside in Ukraine or a European Union country are almost 40.0% more likely to report being extremely dissatisfied (13.0%) or dissatisfied (23.2%) with their lives than students who have not left their usual place of residence. At the same time, this indicator is significantly higher among men than women, which suggests that men have poorer psychological well-being.

Further research aimed to determine the level of psychological resilience among university students, as well as the average level of resilience experienced by this group during the war. The results are shown in Table 4.

Table 4

Levels of Psychological Resilience among University Students during the Wartime

Resilience level	Group 1, %			Group 2, %		
	Total	Male	Female	Total	Male	Female
Low	6.9	8.0	6.6	11.1	14.3	10.3
Below average	13.8	16.0	13.2	16.7	14.3	17.2
Average	34.5	36.0	34.1	24.1	28.6	23.0
Above average	16.4	16.0	16.5	29.6	23.8	31.0
High	28.5	24.0	29.7	18.5	19.1	18.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
Mean value	25.5	23.6	26.0	23.6	23.5	23.7

A high proportion of students in the study groups demonstrate high or above-average psychological resilience, and this does not differ significantly in statistical terms between the groups (Group 1: 28.5% and 16.4%; Group 2: 18.5% and 29.6%, respectively). This indicates an equal ability to withstand stress and emotional tension. It should be noted that the proportion of students in Group 2 who have low psychological resilience is almost twice that in Group 1: specifically, 11.1% of students in Group 2 fall into this category, compared to 6.9% in Group 1. This suggests that a significant proportion of Group 2 students struggle to adapt to stressful situations, recover from difficulties and setbacks, maintain a positive attitude, and perform well in challenging and uncertain circumstances.

The results of the study show that women in Group 1 have higher levels of psychological resilience than men in this group. This is indicated by their highest (29.7%) and lowest (6.6%) levels of psychological resilience compared to other gender groups. This manifests as emotional and behavioural flexibility, and the ability to seek support, maintain optimism, and think positively despite the difficulties of martial law. Notably, the largest proportion of men in Group 2 have low psychological resilience (14.3%), the highest proportion of all gender groups. This manifests as difficulty in maintaining psychological balance, which indicates mental maladjustment and hidden depression.

The mean level of psychological resilience is higher for students in Group 1 than for those in Group 2. The respective percentages are 25.5% and 23.6%. This suggests that they are optimistic, positive thinkers who can adapt their behaviour in different situations and find new solutions to problems. At the same time, the level of psychological resilience is significantly higher among women in Group 1 (26.0%) than among men in the same group (23.6%). This demonstrates their ability to adapt successfully to life's difficulties.

The lowest average psychological resilience score was found among men in Group 2 (23.5%). We believe this is due to the presence of acute psychogenic factors associated with possible mobilisation, loss of relatives, air raids and shelling, and difficulties with employment. These factors may manifest as substance abuse, somatic disorders or antisocial behaviour, and require further research.

Consequently, we observed a significant decrease in the psychological resilience of students who were forced to relocate during the war. On average, students in Group 1 demonstrate higher levels of psychological resilience than those in Group 2. Additionally, the proportion of students in Group 2 with low psychological resilience is almost twice that in Group 1. The gender breakdown shows that women in Group 1 have a higher level of psychological resilience (29.7%), whereas men in Group 2 have a lower level (14.3%). These figures represent the highest and lowest levels observed across all gender groups.

Table 5 shows the descriptive statistics for each item of the resilience scale, including the mean, standard deviation, statistical sum and variance for Groups 1 and 2.

Table 5

Descriptive Statistics for the Resilience Scale Items

Items	Mean		Standard deviation		Skewness		Kurtosis	
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
Item 1	2.66	2.68	0.94	0.99	-0.04	-0.06	-0.66	-0.85
Item 2	2.69	2.56	0.93	1.02	-0.43	-0.64	0.32	0.59
Item 3	2.54	2.37	0.77	0.78	0.19	0.20	-0.39	-0.28
Item 4	2.72	2.41	0.79	0.84	-0.74	-1.37	1.42	1.07
Item 5	2.48	2.29	0.85	0.75	0.19	0.15	-0.56	-0.24
Item 6	2.51	2.35	0.89	0.89	-0.52	-0.76	0.37	0.97
Item 7	2.34	2.15	0.85	0.88	0.39	0.12	-0.38	-0.59
Item 8	2.57	2.34	0.88	1.01	0.18	-0.13	-0.37	-0.15
Item 9	2.39	2.14	1.01	0.96	-0.23	-0.22	-0.59	-0.39
Item 10	2.59	2.36	1.15	1.20	-0.28	-0.04	-1.11	-1.17

Analysis of the reliability of the CD-RISC-10 revealed internal consistencies of 0.929 and 0.919 (Cronbach's alpha) for students who had not left their usual place of residence (Group 1) and those who had been temporarily displaced (Group 2). Similarly, we confirmed that the inter-item correlation was significant.

All items had moderate to high correlations with the scale (item-test correlation), with values ranging from 0.404 to 0.738 in both groups (see Table 6). In other words, the item-total correlation coefficients for the CD-RISC-10 scale were satisfactory, indicating an adequate degree of item homogeneity.

Table 6

Inter-Item Correlation Matrix the Resilience Scale Items

Items	Item 1*	Item 2*	Item 3*	Item 4*	Item 5*	Item 6*	Item 7*	Item 8*	Item 9*	Item 10*
Item 1*	–	0.581	0.468	0.474	0.738	0.518	0.585	0.634	0.549	0.403
Item 2*	0.688	–	0.608	0.560	0.630	0.706	0.614	0.578	0.740	0.519
Item 3*	0.530	0.680	–	0.555	0.683	0.568	0.695	0.643	0.607	0.489
Item 4*	0.404	0.627	0.450	–	0.544	0.642	0.543	0.437	0.608	0.454
Item 5*	0.615	0.525	0.536	0.475	–	0.639	0.757	0.795	0.732	0.440
Item 6*	0.437	0.619	0.470	0.617	0.590	–	0.631	0.629	0.833	0.494
Item 7*	0.608	0.625	0.678	0.420	0.640	0.527	–	0.660	0.734	0.577
Item 8*	0.593	0.556	0.593	0.436	0.729	0.528	0.745	–	0.661	0.456
Item 9*	0.419	0.618	0.529	0.506	0.632	0.718	0.635	0.525	–	0.506
Item 10*	0.463	0.545	0.473	0.416	0.471	0.448	0.643	0.464	0.497	–

Note. *Correlation is significant at the 0.01 level.
Correlations for Group 1 are shown above the diagonal and those for Group 2 are below the diagonal.

The results for the internal consistency of the scales (the Satisfaction with Life Scale (SWLS) and the Connor-Davidson Resilience Scale (CD-RISC-10) are presented in Table 7.

The internal consistency results showed that the SWLS and CD-RISC-10 scales had a high degree of internal consistency, with Cronbach's alpha values above 0.85. All item correlations were above 0.4, indicating that all items contributed well to measuring the SWLS and CD-RISC-10 scales. As we expected, validity evidence revealed a positive and significant relationship between life satisfaction scores (SWLS) and resilience scores (CD-RISC-10). The significant positive strong correlation (r= 0.811, p<0.001) provided evidence of convergent validity.

Table 7

Internal Consistency for the SWLS and CD-RISC-10

Measures	Cronbach's alpha values	
	Group 1	Group 2
Satisfaction with Life Scale (SWLS)	0.917	0.856
Connor-Davidson Resilience Scale (CD-RISC-10)	0.929	0.919

Discussion

A study of scientific publications has revealed that most scientists view life satisfaction as a complex and multifaceted concept that reflects an individual's overall quality of life (Melnyk et al., 2025; Mishra & Bharti, 2024; Sabatini et al., 2023).

Stappen (2012) defined life satisfaction as a concept that encompasses both the conditions and circumstances necessary for an individual to function fully and their evaluation of their actual existence.

Other scientists define quality of life as comprising spiritual, material, socio-cultural, environmental, and demographic components. In other words, it could be argued that quality of life encompasses all aspects of human existence (Degroote et al., 2014; Elshaer, 2023; Jovanovic & Brdar, 2018).

Additionally, researchers believe that satisfaction with certain aspects of life is linked to one's emotional attitude towards life, oneself, and others (Veenhoven, 2001). This suggests that life satisfaction encompasses positive experiences and a positive attitude towards oneself and others (Milewska-Buzun et al., 2023).

We believe that life satisfaction is a state characterised by the fulfilment of one's current physical, psychological, social and spiritual needs, in line with one's life aspirations, opportunities, requirements and expectations.

The present study employed the Satisfaction with Life Scale (SWLS), the most widely used instrument for measuring life satisfaction. Its psychometric properties (Emmerson et al., 2017) have been thoroughly analysed worldwide.

Our research showed that the proportion of students who are internally displaced persons who are extremely dissatisfied (13.0%) and dissatisfied (23.2%) is almost 40.0% higher than the proportion of those who did not leave their usual place of residence who are extremely dissatisfied (8.6%) and dissatisfied (17.2%). These findings are consistent with our previous research in this area (Melnyk et al., 2025).

The data obtained suggest that staying in safer regions during wartime can lead to mental health and psychological well-being disorders, despite the socio-economic and psychological difficulties involved. Conversely, certain studies have suggested that enhancing a person's psychological resilience can improve life satisfaction and psychological well-being (Eisenberg et al., 2016).

Current scientific periodicals present various views on the concept of "psychological resilience".

According to McGinnis (2018), resilience is the psychological ability to withstand and overcome adversity positively, thereby restoring the same level of well-being as before the negative event occurred.

Some researchers consider psychological resilience to be the ability to successfully adapt to life's difficulties (Carril & Liébana-Presa, 2017; Yates et al., 2015). It is associated with various factors, including efficiency, optimism, hope and a greater ability to overcome problems, as well as greater professionalism and a more positive cognitive assessment (Stewart & Yuen, 2011).

Other scholars characterise psychological resilience as a process of positive adaptation and development in situations that pose a significant threat to human life or functioning (Southwick, 2014).

Psychological resilience enables individuals to actively adapt to serious adversity, recover from stressors, and maintain mental health (Meulen et al., 2020; Ssenyonga et al., 2013). It is a powerful personal resource that helps individuals adapt to change after experiencing trauma, enabling them to return to normal functioning.

It should be noted that psychological resilience encompasses an individual's ability to access various resources in response to challenges (Chen et al., 2016). Some researchers have also found an association between psychological resilience and an improved quality of life (Chow, 2021). Meanwhile, Pypenko et al. (2020) and Melnyk et al. (2022) examined the effect of distance learning on the social and psychological well-being of university students.

We believe that psychological resilience is not about being protected from stress; rather, it is about a person's ability to adapt well to a situation. Not everyone is resilient, nor do they all react to failure in the same way. The definition of psychological resilience depends on a variety of factors.

The current study found a positive correlation between resilience and life satisfaction. A significant decrease in psychological resilience was observed among students in Group 2, who had relatively low levels of life satisfaction. On average, students in Group 1 had a higher level of psychological resilience (25.5%) than those in Group 2 (23.6%). Furthermore, the proportion of students in Group 2 with low psychological stability was almost double that in Group 1.

These results are consistent with previous studies investigating resilience and life satisfaction among university students in Romania (Hartley, 2012), Malaysia (Cazan & Truta, 2015), Greece (Samani et al., 2007) and Saudi Arabia (Aboalshamat et al., 2018).

Of the various factors interacting with psychological resilience, gender is a particularly important factor, as shown by the above-mentioned studies. Researchers (Allan et al., 2013; Erdogan et al., 2015; Zurita-Ortega et al., 2018) have found that male university students tend to be more resilient than female students. Numerous studies conducted over many years indicate that gender does not affect resilience levels on the CD-RISC 10 scale. No statistically significant correlations were identified in the research of Arrogante et al. (2017), Cai et al. (2019), Mealer et al. (2016) and Yu et al. (2020).

The present study revealed some interesting findings. On average, women in Group 1 exhibited significantly greater psychological resilience than men (26.0% and 23.6%, respectively). Meanwhile, the difference between the percentage of men and women in Group 2 with this indicator is negligible (23.5% and 23.7%, respectively). In our opinion, this is related to the living conditions experienced by university students during the war. Forced displacement reduces their ability to adapt to difficulties in life, regulate their emotions, communicate with others, use social connections to overcome

difficulties and maintain mental health, as well as achieving success in various areas of life. Therefore, it is necessary to develop and implement psychological intervention, social assistance and support programmes for university students more actively during wartime. These programmes should improve students' mental wellbeing and enhance their learning effectiveness.

Conclusions

The war in Ukraine is having a significant impact on the mental health of its citizens. Like everyone else, students are trying to adapt to the situation, either by leaving their homes for safer regions of Ukraine or EU countries, or by staying put. Fear of death, anxiety, concern for loved ones and being forced to relocate all negatively impact mental health, life satisfaction and psychological resilience.

Analysis of scientific publications shows that most researchers consider life satisfaction to be a complex, multifactorial construct subject to structural change, which serves as a general assessment of an individual's quality of life. We define life satisfaction as a state characterised by the fulfilment of one's current social, physical, psychological and vital needs in accordance with one's life aspirations, opportunities, requirements and expectations.

The present study showed that living in safe conditions, even abroad, does not necessarily lead to a high quality of life. University students who are internally displaced persons and reside in Ukraine or a European Union country report levels of absolute and general dissatisfaction with their lives that are almost 1.4 times higher than students who have not left their usual place of residence. At the same time, this indicator is significantly higher among men than women, suggesting poorer psychological well-being among the former. The data obtained indicate that remaining in safer regions or abroad during wartime contributes to psychological distress and dissatisfaction with life, even in difficult socio-economic and psychological conditions.

Psychological resilience is a person's ability to adapt well to situations, and it depends on a variety of factors. This study found that students who were forced to relocate during wartime experienced a significant decrease in psychological resilience. On average, students in Group 1 have a higher level of psychological resilience (25.5%) than those in Group 2 (23.6%). Additionally, the proportion of students in Group 2 with low psychological resilience is almost twice that in Group 1. Gender differences include a higher prevalence of high psychological resilience among women in Group 1 (29.7%) than among men in Group 2 (14.3%). The latter figure represents the highest prevalence among all gender groups.

The current study therefore found a positive strong correlation ($r = 0.811$, $p<0.001$) between psychological resilience and life satisfaction among university students during wartime. A significant decrease in psychological resilience was observed among students in Group 2, who had relatively low levels of life satisfaction. This is why it is necessary to develop psychological intervention, social assistance and support programmes more actively during the war in Ukraine. These programmes should improve the mental well-being and learning effectiveness of university students.

Ethical Approval

The psychological methods and research procedure used in the study were approved by the Committee on Ethics and Research Integrity of the Scientific Research Institute KRPOCH (protocol no. 026-1/SRIKRPOCH dated 10.08.2024)

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SOCIAL AND BEHAVIORAL SCIENCES. Economics

ORIGINAL RESEARCH

Data Quality Factors for Big Data Analytics in Occupational Health and Risk Management

Authors' Contribution:
A – Study design;
B – Data collection;
C – Statistical analysis;
D – Data interpretation;
E – Manuscript preparation;
F – Literature search;
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Abstract

Background and Aim of Study: *Occupational health and risk management (OHRM) in the South African mining sector remains a critical national priority, where the life or death outcomes can be impacted by poor quality-data usage. Big data analytics (BDA) is increasingly used for hazards predictions and timely decision-making.*
The aim of the study: to explore critical data quality factors that influence the reliability and effectiveness of BDA for decision-making to guide occupational health practitioners and risk managers within South African mining sector.

Material and Methods: *The study employed a quantitative survey methodology, informed by the literature review, to identify key data quality factors of BDA impacting OHRM in the South African mining sector. Underpinned by Technological, Organizational and Environmental (TOE) theory and contextual factors within big data quality dimensions and big data sources. Data was collected from 103 OHRM experts determined by the population size of 140.*

Results: *The results reveal the following factors to have influence on data quality for BDA within SA mining OHRM; Environmental factors with a predictive power of 25.0% (β=0.250) at p=0.014; followed by big data quality dimensions with 24.1% (β=0.241) at p=0.008; then, technological factors with 15.9% (β=0.159) at p=0.027; big data sources with 13.2% (β=0.132) at p=0.026; lastly organisational factors was less significant at p=0.228 with 10.0% (β=0.100).*

Conclusions: *This study identifies the factors of data quality, highlighting its role in BDA for decision-making within OHRM. These factors can further be used to provide guidance for SA mining OHRM decision makers to target critical data quality improvement areas for enhanced decision making in the sector.*

Keywords: *big data analytics, data quality, mining safety, occupational health, risk management, South Africa.*

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Introduction

The mining sector serves as the pillar of the world's financial resource; however, minimizing risk-related issues and negative environmental effects presents a significant challenge in the industry (Bag et al., 2021). The mining industry leverages various big data sources to prevent occupational hazards, and to ensure a secure working environment (Abd Karim & Sejati, 2021). These big data sources generates vast amount of data, according to Ntlhakana et al. (2021), big data has a radical effect on occupational health and enables the early identification of high-risk patients through the integration of big data source technologies (Brouwer & Rees, 2020). Mining industry professionals make use of this data to inform decision-making processes and mitigate the adverse effects of the occupational health challenges such as occupational hearing loss (Moroe et al., 2019). Failure to address environmental, social and governance challenges may negatively impact the reputation of organisations. Loss of revenue and further increase the risk of none compliance (van Rensburg et al., 2019).Therefore, big data analytics (BDA) and data quality may be of value, as both appear to be drivers of transformation and improvement in the mining industry (Bisschoff & Grobbelaar, 2022).

The use of BDA is expanding with increasing acknowledgement from academia and industry. BDA refers to the systematic examination and analysis of large datasets that exceed traditional analytical capabilities (Hariri et al., 2019), utilizing innovative techniques for data storage, management, analysis, and visualization (Vassakis et al., 2018) of massive and complex datasets, commonly known as Big Data (Kuo et al., 2014). BDA offers potential significant benefits for organisational performance in the mining industry. Furthermore, can enables data driven decision making, which may lead to improvement of organisation's efficiency and profitability (Vassakis et al., 2018). Additionally, applying BDA within Occupational Health and Risk Management (OHRM) in the mining sector may improve effectiveness of the environment using big data-driven innovations beneficial for sustainability (Bag et al., 2021).

Despite noticeable BDA potential on OHRM, data quality remains the main challenge to the accuracy of the outcomes. Poor data quality appears to be disadvantaging organisations to fully benefiting from the value of using BDA (Cai & Zhu, 2015). According to Vassakis et al. (2018) obtaining the insightful outcomes from BDA analysis of accurate and reliable data of is required. As data quality remains essential to leverage accurate and meaningful decision-making, which may influence organizational growth (Segooa & Kalema, 2024) taking into account the conditions of digitalisation in the economy (Pypenko, 2019; Pypenko & Melnyk, 2021).

Data Quality is defined as the degree of data usefulness (Wang et al., 2023), for its intended application and requirements (Declerck et al., 2024). In the realm of big data analytics, data quality is critical for identifying patterns, correlations, and trends within massive amounts of data (Feng et al., 2019), in which impacts the success of the processes that are driven by data, analytics and decision-making systems (Rangineni et al., 2023). According to Bisschoff and Grobbelaar (2022), data quality is critical to obtain accurate insights and protect companies from making poor decisions as a result of poor data quality and includes objectively and correctly describing real situations (Tylečková & Noskievičová, 2020).

High-quality data is critical in the mining sector due to the nature of the environment, which involves managing number of risks, including safety, health, and environmental sustainability. Hence, in South African mining sector, sustainable development entails the investigation for the intersections between the mining companies' goals, their business procedures, and the subsequent effects on the welfare of the community, safety, and health (Bag et al., 2021). Poor data quality leads to inaccurate evaluations of occupational health risks, in which can potentially compromise employees' safety, increase penalties (Mishra & Mishra, 2023), erroneous reporting and noncompliance with various occupational health and safety regulations (Maroun, 2019). In addition, Feng et al. (2022) emphasized the significance of missed organizational learning opportunities within the healthcare field, pointing out concerns related to underreporting, contributing factors, and quality improvement projects. Organizations involved in mining can gain a better understanding of unsafe behaviours and potentially uncover instances of underreporting that impact the accuracy and reliability of data related to occupational health and safety in the mining sector (Kumar & Bhattacharjee, 2023). Moreover, Luo et al. (2023) emphasized how inadequate safety technology training and delayed hazard identification can contribute to underreporting of accidents, affecting quality of data within the OHRM in the mining sector.

The aim of the study. To analyse the factors that influence data quality in big data analytics to improve decision making within the SA mining sector. By exploring these factors, the study is intended to address big data quality challenges as well as their impact in decision making processes for OHRM within SA mining organisations.

Materials and Methods

According to Lim et al. (2013) the information services (IS) theories are considered a foundation of information systems research study, which provides a design and guidance on investigating a phenomena. For the researcher to present unbiased results, the choice of IS theory framework is derived from the topic of the study, research objectives and literature review (Chukwuere, 2021).

This study integrated TOE IS theory with big data quality dimensions and big data sources, as an underlying theory to expand the existing theoretical body of knowledge, considering the factors identified by the researcher while during the review of the literature.

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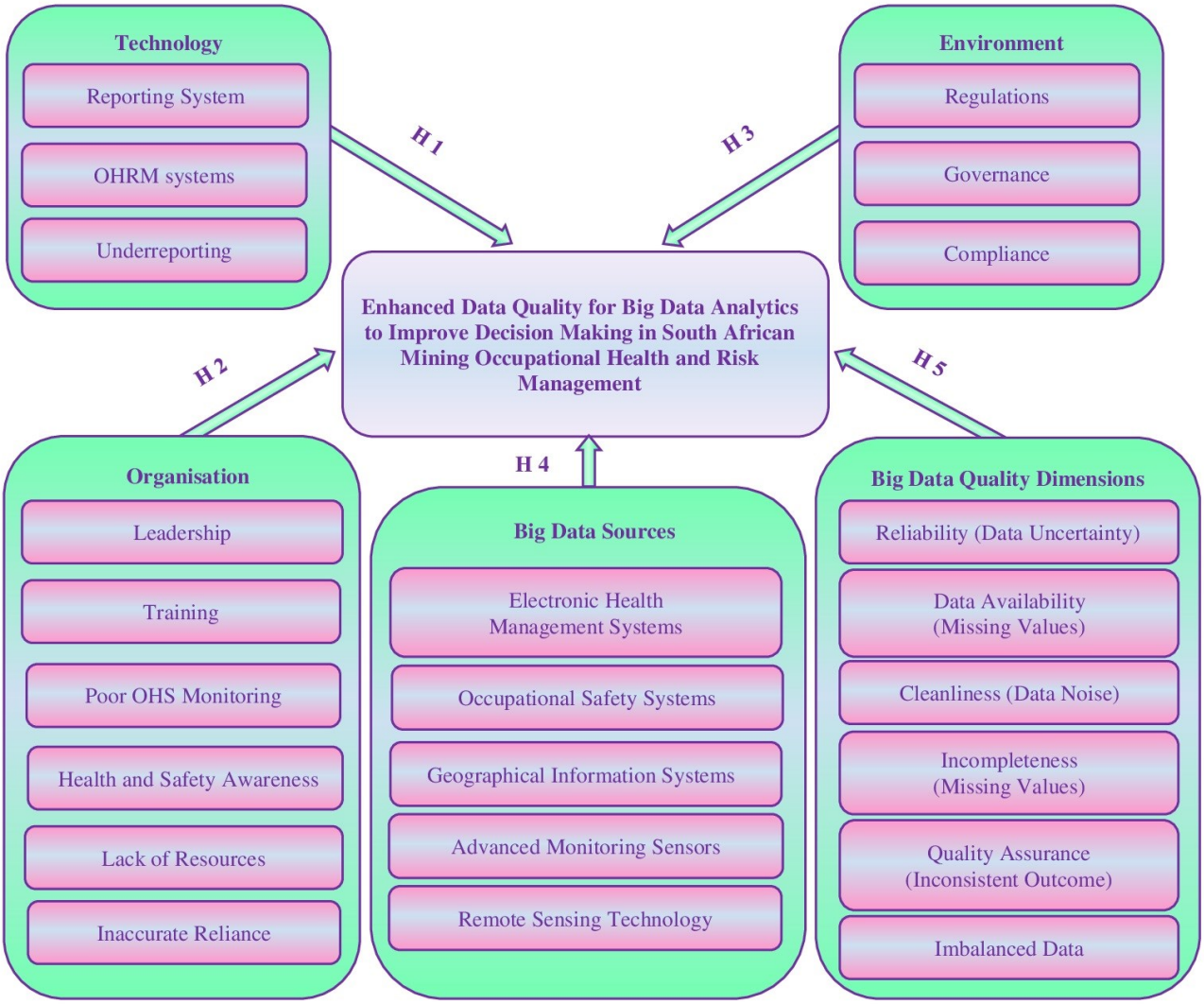
TOE framework is known for its ability to provide a more comprehensive approach by taking into account technological, organisational and environmental factors (Ullah et al, 2021).

Figure 1 presents conceptual model of enhanced data quality for BDA to improve decision making in SA mining OHRM.

Figure 1

Conceptual Model of Enhanced Data Quality for Big Data Analytics to Improve Decision Making in South African Mining Occupational Health and Risk Management



This study employed quantitative methodology following positivist approach to explore big data quality factors for BDA to improve decision making in the SA mining industry. Positivist approach is usually associated with the quantitative research paradigm, in which the researcher would utilize surveys, questionnaires, or experimental techniques to extract and generalize the results (Kivunja & Kuyini, 2017). The questionnaire was developed and employed as a data collection tool in this study, to discover patterns and factors that influence the quality of data in BDA, for the incidents involving occupational health and safety (OHS), risk hazards and processes for decision making. This study used sampling determinants method by Krejcie and Morgan (1970) to determine the sample size of the study, which guided that the population of 140, requires a sample size of 103. The researcher selected relevant participants and aligned with the field of study and research objective to obtain insights and measure data quality factors identified during the review of the literature in the OHRM within the mining sector. To collect data from the sample size of 103 OHRM participants, the researcher used google forms to create a questionnaire for seamless administration of the responses.

This study considered directly impacted stakeholders from one of the largest gold mine in South Africa as a sample population, specifically selected subject matter experts (SMEs) within the OHRM disciplines such as occupational health, occupational hygiene, safety management, radiation and risk management. As they rely on BDA for decision making and data quality is critical for their prediction. The selection criteria is presented on Table 1.

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Table 1
Selection Criteria

Stream	Sample size for Questionnaire
Occupational Safety	21
Occupational Hygiene	11
Radiation	10
Occupational Health	41
Risk Management	20
Total	103

According to Albers (2017), in order to reach a conclusion in a quantitative research study, a numerical data must be gathered and analysed. Data analysis reveals the linkage of the study's contextual setting, main trends and patterns. In this study statistical tests and tools such as Statistical Package for the Social Sciences (SPSS) version 28.0.0.0 from IBM was used for data analysis to obtain conclusions from the collected data. According to Bauer et al. (2021) most of the quantitative studies consists of the basic statistical analytic methods, such as correlation regressions, descriptive statistics, and analysis with or without probabilities, measurements of statistical significance and interactions. The results overall reliability was conducted for the study as presented in Table 2.

Table 2
Overall Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.966	0.966	86

The overall reliability statistics based on the Cronbach's alpha coefficient was 0.966 measured on 86 items. This value is acceptable (Taber, 2017) as it is above the minimum value of 0.7.

Results

The study considered South African Mining Occupational Health and Risk Management experts, which included the total responses of 104 participants. Thus, 1 chief safety officer, 9 group technology (GT) systems specialists, 15 occupational health managers, 22 occupational health nursing practitioners, 1 occupational hygiene manager, 12 occupational hygienists, 13 occupational medical practitioners, 1 radiation manager, 8 radiation protection officers, 20 risk management specialists and 2 safety officers as shown in Table 3.

Table 3
Frequencies of Participants' Demographics

Variables		Frequency		
		Person	Percent	Cumulative percent
Gender	Female	56	53.8	53.8
	Male	48	46.2	100.0
	Total	104	100.0	–
Age group	21-30 years	2	1.9	1.9
	21-40 years	28	26.9	28.8
	41-50 years	42	40.4	69.9
	51 years and above	32	30.8	100.0
	Total	104	100.0	–
Education	Matric	10	9.6	9.6
	National Diploma	32	30.8	40.4
	Bachelor Degree	55	52.9	93.3
	Master Degree	6	5.8	99.1
	Doctoral Degree (PhD)	1	1.0	100.0
	Total	104	100.0	–
Location	Free State	32	30.8	30.8
	Gauteng	49	47.1	77.9
	North West	22	21.2	99.0
	South Africa	1	1.0	100.0
	Total	104	100.0	–
Position	Chief Safety Officer	1	1.0	1.0
	GT Systems Specialist (SHERQ/HRM)	9	8.7	9.6
	Occupational Health Manager	15	14.4	24.0
	Occupational Health Nursing Practitioner	22	21.2	45.2
	Occupational Hygiene Manager	1	1.0	46.2
	Occupational Hygienist	12	11.5	57.7
	Occupational Medical Practitioner	13	12.5	70.2
	Radiation Manager	1	1.0	71.2
	Radiation Protection Officer	8	7.7	78.8
	Risk Management Specialist	20	19.2	98.1
	Safety Officer	2	1.9	100.0
	Total	104	100.0	–
BDA Utility	Yes	5	4.8	4.8
	No	99	95.2	100.0
	Total	104	100.0	–

Furthermore, Table 3 presents that OHRM discipline consists more of employees above 31 years of age than 21-30 years of age; this result is valid as mining industry retains its employees due to level of experience mostly in occupational safety and risk. Moreover, the table shows that 9.6% of participants had matric certificates as their highest qualification, 30.8% had national diploma, 52.9% had Bachelor's degree, 5.8% had Master's degree and 1.0% of the participants had PhD, the findings indicates that most participants hold Bachelor's degree with 55.0%. Therefore, this study is valid as OHRM specialists are required to have attended a formal training and education. Table 3 further demonstrates locations, and only 3 provinces out of 9 in South Africa, and South Africa as country, the assumption is that participant might be working in multiple provinces, according to the results Gauteng had the highest responses at 47.1%, followed by Free State with 30.8% and the lowest being North West with 22.1%. Therefore, this study is valid as the sampled mining organisation only operates in 3 provinces in South Africa, which is Free State, Gauteng and North West. On BDA utilization, Table 3 indicates demonstrates that only 5 participants of the total of 104 participants which is 4.8% are not using big data analytics tools in their daily duties. As a result, 95.2% of the participants utilize big data analytics tools for decision-making.

Regression Statistical Analysis

This study considered regression statistical analysis to determine the relationship between enhancing data quality for BDA analytics as an independent variable and number of dependent variables thus, Technological, Environmental, Organisational, Big Data Quality dimensions and Big Data Sources. Linear regression statistical analysis is an analytical method used to determine the influence that an independent variables has on the dependent variable (Wardhani et al., 2021). The results of the statistical analysis are presented in Table 4.

Table 4

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.779[a]	0.608	0.587	0.410	0.608	30.337	5	98	0.000

Note. a. Predictors: (Constant), Big Data Sources, Technological, Organisational, Data Quality and Environmental; b. Dependent Variable: Enhancing Data Quality for BDA.

According to Table 4, the correlation value of R Square is 60.8% (0.608), which indicates the contribution between the individual variables towards dependent variable "Enhancing data quality in BDA for effective decision-making". While the correlation value of 0.779 indicates, the overall contribution of individual independent factors towards the conceptual model to enhancing data quality in BDA for improved decision-making in South African Mining Sector OHRM is 77.9%.

Furthermore, the sig. F change value of 0.00, which is below 0.05, indicates that the prediction of the identified big data quality factors for BDA is significant and can be considered to improve decision making in SA mining sector. The regression coefficients are shown in Table 5.

Table 5

Regression Coefficients

Model	Unstandardized coefficients		Standardized coefficients	*t*	Sig.	Collinearity statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0.413	0.286	–	1.441	0.153	–	–
TechFactor	0.159	0.070	0.171	2.252	0.027	0.692	1.445
OrgFactor	0.100	0.093	0.094	1.068	0.288	0.520	1.923
EnvFactor	0.250	0.101	0.278	2.491	0.014	0.322	3.109
DataQualityFac01	0.241	0.089	0.270	2.708	0.008	0.402	2.488
BigDataSourcesfac01	0.132	0.058	0.170	2.266	0.026	0.714	1.400

Note. TechFactor – technological factors; OrgFactor – organisational factors; EnvFactor – environmental factors; DataQualityFac01 – big data quality dimensions; BigDataSourcesfac01 – big data sources.

Based on the regression coefficients on Table 5, the findings reveal that the factors that influence data quality for BDA within SA mining OHRM are; Environmental factors with a predictive power of 25.0% (β=0.250) at p=0.014 which is the most influential; followed by big data quality dimensions with 24.1% (β=0.241) at p=0.008; then, technological factors with a predictive power of 15.9% (β=0.159) with significance level of

p=0.027; big data sources with 13.2% (β=0.132) at significance level of p=0.026; lastly organisational factors was found to be less significant at p=0.228 with predictive power of 10.0% (β=0.100).
Table 6 presents the results for the tested set hypotheses of the study.

The results indicates that only four of the hypotheses were supported after quantitative data analysis: H1, H3, H4 and H5. While one hypothesis, which is H2 – organisational factors, was rejected.

Table 6
Hypotheses Results

Hypothesis	Sig.	Results
H1 – Technologies, such as OHRM systems and Underreporting have influence on enhanced data quality for BDA to improve decision-making in South African mining OHRM	P=0.027<0.05	Accepted
H2 – Organisational factors, which includes leadership, lack of training and resources, lack of Health and Safety awareness, poor OHS Monitoring, inaccurate Reliance influence enhanced data quality for BDA for effective decision-making in South African mining OHRM	P=0.288>0.05	Rejected
H3 – Environment factors, which includes external governance, legislation and compliance influence the enhancement of data quality for BDA to improve decision-making in South African mining OHRM	P=0.014<0.05	Accepted
H4 – Big data sources, such as Occupational safety systems EHMS, GIS, advanced monitoring sensors, remote sensing technology, have influence on enhancing data quality for BDA within South African mining OHRM to improve decision-making	P=0.026<0.05	Accepted
H5 – Big data quality dimensions, which consist of data availability, cleanliness, imbalanced data, reliability, incompleteness and quality assurance have influence on data quality enhancement for BDA to improve decision-making in the South African mining OHRM to improve decision-making	P=0.008<0.05	Accepted

Discussion

The aim of this study was to identify critical factors of data quality in BDA to improve decision making within OHRM for mining sector. In this section, the researcher discusses the key data quality factors identified during literature review, which informed hypotheses, and further tested in this study.

Big Data Quality Technological Factors

Table 6 shows that H1 (P=0.027<0.05) was accepted, suggesting that Technological factors such as reporting systems, OHRM systems and underreporting have significant influence on enhancing data quality for BDA within South African mining OHRM to improve decision-making. These results are supported by the study conducted by Famure et al. (2019) that Electronic Health Record (EHR) systems have contributed to the emergence of BDA in healthcare by offering chances for quality improvements, which are crucial components for enhancing data quality in occupational health and safety. Consistently, the study conducted by Yang et al. (2021) underscores the importance of robust reporting systems and information technology in identifying causes of safety issues and accidents within the coal mine industry, emphasizing the role of technological advancements in enhancing safety practices and data quality within the industry. Moreover, the study by Zhou et al. (2018) further supports the outcomes highlighting the critical importance of robust OHS systems and risk management within the mining sector. Additionally, the research highlights the significance of OHS management practices in fostering organizational safety culture, risk management, and incident prevention, by managing risks and implementing safety measures effectively, mining organizations can enhance data quality, reduce negative occurrences, and cultivate a safe working environment for employees (Stojanović et al., 2024).

Big Data Quality Organisational Factors

Table 6 shows H2 (P=0.288>0.05), was rejected which indicates that organisational factors such as leadership, lack of training, resources, lack of awareness within Health and Safety, poor monitoring of OHS, and inaccurate Reliance do not significantly have influence on data quality enhancement within BDA for effective decision-making in South African mining OHRM. According to Sarstedt and Mooi (2018), the overall parameter that it is greater than 0.05 is considered to be not significant.

These organisational factors were identified in accordance to the literature conducted by Johnson et al. (2021) who revealed that data quality improvement is a top management function through an empirical investigation of BDA capabilities implementation. Whilst, Haas (2020) established that leadership has a critical role in shaping safety culture and impacting health and risk management processes at the operational level, on the study highlighting the need for developing effective decision-making models in occupational health and safety. Moreover, research by Hermanus (2007) identified resource limitations in small mining companies contribute significantly to health and risk management concerns.

Furthermore, Franke and Hiebl (2022) acknowledged the need for skilled data analytics resources to effectively examine big data and derive meaningful insights for

informed decision-making in mining. In support, Alnefaie et al. (2022) identified the vital role played by data specialists play in processing big data to facilitate decision support, and identifying data sources and required competencies can significantly influence data quality in mining. In addition, According to Nazari et al. (2020), training and knowledge development are essential to overcome BDA challenges and leverage its benefits effectively. Similarly, Muhunzi et al. (2023) found that training healthcare professionals to leverage BDA effectively may improve patient outcomes and reduce healthcare costs. Moreover, Andrews et al. (2019) supported that stuff training along with data quality initiatives are critical for improving healthcare delivery processes, and for accurate process mining outcomes.

Big Data Quality Environmental Factors

The study accepted H3 (P=0.014<0.05) – environmental factors, which include external governance, legislation and compliance are significantly influencing the enhancement of data quality for BDA within the South African mining OHRM to improve decision-making, as shown in Table 6. These results are supported by Muthelo et al. (2022), who focused on investigating occupational health and safety practices and compliance within South African mining sector, specifically in the province of Limpopo, utilizing principal component analysis. By identifying key attributes associated with compliance with health and safety standards, this study indirectly underscores the importance of regulatory adherence in upholding data quality within the OHS context of the mining sector (Muthelo et al., 2022). Moreover, Donkor et al. (2023) further emphasized the significance of complying with safety regulations to mitigate risks and safeguard workers' well-being, which can ultimately impact data quality by ensuring precise reporting and monitoring of occupational health and safety metrics. Moreover, Chikosi and Mutezo (2023) identified that occupational health and safety risks are frequently known challenges within the mining industry, which includes the inefficient organisational governance systems. In addition, it is important to implement effective data governance to manage and control data use, enhancing data quality, availability, and integrity within organizations (Aseeri & Kang, 2022). South African mining sector is a very well regulated and governed entity more especially within the areas of occupational health and risk management. According to Rikhotso et al. (2022), each regulatory compliance is associated with the cost, which corresponds to the requirements such as medical examination, risk assessment and reassessment, workplace inspections, training programs, workplace control, PPEs and labelling, disposal, offenses and penalties, and keeping records.

Big Data Quality Sources

Table 6 it shows that H4 (P=0.026<0.05) was accepted which indicates that big data sources such as occupational safety systems EHMS, GIS, advanced monitoring sensors, remote sensing technology, have influence on data quality enhancement in BDA within the South African mining OHRM for effective decision-making. These results are consistent with the study conducted by Abd Karim and Sejati (2021), indicating that the mining industry leverages various big data sources such as OHRM systems to prevent occupational hazards, and to ensure a secure working environment (Andri Estining Sejati, 2021). Furthermore, the study conducted by Montisci et al. (2022) identified the variety of big data sources, such as systems for injury-reported incidents, clinical examinations, and electronic health records. Moreover, mining industries integrated multiple big data sources such as remote sensing technologies, geographical information systems (GIS) and machine learning to enhance safety and risk management decision-making (Musiałek & Maksymowicz, 2024; Li et al., 2021). Additionally, according to Ntlhakana et al. (2021) mining industries are using electronic health management systems to maintain employee's records and to proactively monitor occupational health diseases, which includes hearing loss and respiratory conditions in the mining environment.

Big Data Quality Dimensions

As presented in Table 6, this study accepted the significance of H5 (P=0.008<0.05) – big data quality dimensions, which consist of data availability, cleanliness, imbalanced data, reliability, incompleteness and quality assurance have influence in enhancing data quality for BDA in the South African mining OHRM to improve decision-making. This outcome was supported by Arikekpar and Bestman (2023), who identified accuracy, completeness and timeliness as main components of data quality. In addition, Abburi (2024) identified consistency and accessibility as key dimensions to ensure that data is fit for purpose. Furthermore, findings by Cresswell et al. (2024) further identified features such relevance and reliability as relatively defined with major data quality components such accuracy, timeliness and representativeness. According to Luo et al. (2023) there are persistent data availability issues impacting the implementation of appropriate risk management strategies for effective decision-making within responsible customs departments guided by risk assessment outcomes. In addition, Hermanus (2007) identified the reliability issue in occupational health data as a challenge where there is a lack of reporting systems and criteria that are well-established such as within developing countries which includes South Africa (Gheorghe et al., 2022) further supported the outcomes through comparison of the inconsistent number of loss-of-life cases and incidents as evidence in the assessment of data quality for underreporting within occupational health and safety.

Conclusions

This paper has presented and explored the critical data quality factors that impact decision making within the mining OHRM. The identified factors been technologial, environmental, big data quality dimensions and big data sources. These findings suggest that SA mining industry is well regulated by environmental factors such as external governance and compliance. Therefore, there is a full reliance on big data sources to capture data and support effective decision-making within OHRM,

despite persistent data quality challenges. Furthermore, this study imparts big data quality dimensions and sources as crucial factors in BDA for effective decision-making in South African mining sector, Occupational Health and Risk Management. This study identifies that technological factors that hinder high quality data usage in the South African mining sector includes reporting systems, OHRM Systems and unnderreporting that is caused by lack of integrations within the systems to be influencing data quality for BDA. However, there is a need to further analyse this factors individually following a qualitative method to gather indepht insights and investigate the level of signficance for the organisational factors, as it was found not sufficient and that led the hypothesis H2 to be rejected.

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Ethical Approval

The study obtained ethical clearance from the institution's Ethics Committee under Ref. No. HREC2024=08=001 (ICT).

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ORIGINAL RESEARCH

Factors Affecting the Implementation of Integrated Management of Neonatal and Childhood Illness by Indian Health Professionals

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A – Study design;
B – Data collection;
C – Statistical analysis;
D – Data interpretation;
E – Manuscript preparation;
F – Literature search;
G – Funds collection

Abstract

Background and Aim of Study: *Integrated management of neonatal and childhood illness (IMNCI) is a globally proven, primarily community-based strategy to improve child survival and is being implemented worldwide in countries with high burden of child mortality. The aim of the study: to identify the factors that affect the implementation of IMNCI by healthcare professionals in healthcare facilities, and to assess their attitude towards the implementation of IMNCI.*

Material and Methods: *The study was conducted at health care facilities of Thiruvarur district, Tamilnadu, India. A total of 100 health professionals were included in the present study. Mean age of the study participants was 36± 3 years. Most of them were males. Mean age of their work experience was 5.7± 2.1. In the study 79% of respondents attended IMNCI training at different time. Almost 86% of study participants have not received any follow up training in last 2 years. All participants was administered a predesigned, pretested, semi structured questionnaire on IMNCI. Version 21 of the SPSS software was used to record and analyse the responses.*

Results: *Health system related factors identified as hindrance to IMNCI implementation on case management skills according to this study are, overcrowding of people (26%), time consuming (21%), shortage of staffs (17%), untrained staff (10%), lack of supervision(6%), and lack of supplies(12%). Attitude of the health care providers on treating children's based on algorithm were found to be unsatisfactory.*

Conclusions: *Efforts to improve the quality of child health services provided by health care providers in the less developed countries should focus not only on resource-intensive structural improvements, but also on cheap, cost-effective measures, especially the proper use of national guidelines for case management, and meaningful supervision. Government leadership, along with more structured and continued resource and training support, is necessary to foster sustainable IMNCI health care services within the needs of the local community.*

Keywords: *integrated management of neonatal and childhood illness, factors, health care providers, implementation*

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Introduction

Integrated Management of Neonatal and Childhood Illness (IMNCI) strategy is an integrated approach to child health that holistically focuses on the well-being of the child. IMNCI strategy aims to reduce illness, disability, death, and to promote improved growth and development among children under 5 years of age. The strategy includes both preventive and curative elements that are implemented by families, communities, and health care facilities (WHO, 2005).

Every year about 9 million children in developing countries die before they reach their fifth birthday, many of them during the first year of life (Jones et al., 2003).

It is estimated that in India 2.1 million children die before reaching 5 years of age.

Approximately 28% of all deaths of new-borns and 23% of all infant deaths in the world occur in India (UNICEF, 2025).

Currently almost 2/3rd of infant mortality is comprised of neonates; most of them die within the first week of life (Jones et al., 2006).

More than 70 % of the under-five child deaths are due to five diseases, namely pneumonia, diarrhoea, malaria, measles and malnutrition, and often to a combination of these conditions. Many of these deaths could be prevented by greater access to and use of high quality healthcare in combination with improved new-born and infant care practices in families through IMNCI (Darmstadt et al., 2005).

Implementation of IMNCI in comprehensive and holistic approach that forms bench mark for basic child health in preventing the under 5 deaths through case management approach which includes the five elements i.e. assessment, classification, treatment, counselling and referral (WHO, 2003).

The IMNCI strategy provides home-based care for the new-borns and the young infants. The home care component for new-borns aims to promote exclusive breast feeding, preventing hypothermia, improvement in the recognition of early clinical illnesses by parents and health care providers at the grassroots level and therefore reducing the delays in seeking proper care (Ingle &Malhotra, 2007).

Several studies conducted in different countries indicated that the implementation of the IMNCI strategy is still inadequate.

The most common identified problems are lack of training, poor supervision, lack of IMNCI essential drugs and on jobs aid, health workers perception, shortage of the staffs, nature of the strategy and lack of support from the government and stake holders (Bhandari et al., 2012; Mohan et al., 2012). With this background, this study was undertaken to assess the factors affecting the Implementation of IMNCI among Health Professionals of Rural Health Care Facilities in Thiruvarur district of Tamil Nadu.

The aim of the study. To identify the factors affecting the implementation of the integrated management of neonatal and childhood illnesses by healthcare professionals in healthcare facilities, and to evaluate their attitudes towards this implementation.

Materials and Methods

The study was conducted at healthcare facilities in four blocks of Thiruvarur district. The Thiruvarur HUD District Health Unit Department functions across 10 blocks. Each block has one main primary health centre (PHC) and is strengthened by five additional PHCs, making a total of 50 PHCs. Each PHC is attached to four sub-centres, making a total of 200 sub-centres which provide services at a grassroots level. Healthcare workers were selected from four blocks: Adiyakkamanaglam, Thiruvizhlimalalai, Perumpanaiyur and Poonthotam. This area was selected because it is covered by the Department of Community Medicine at GTMC. All health professionals working in the selected facilities were present on the days of data collection.

A predesigned, pretested, semi-structured questionnaire contains the following items:

a) Identification data, i.e. age, gender, educational status, area of residence and socioeconomic status.

b) Assessment of case management skills on the IMNCI strategy.

c) Factors affecting the implementation of the IMNCI strategy.

The study subjects were selected from four blocks of Thiruvarur HUD. One block constitutes one block PHC, five PHCs and one sub centre. The staff pattern at each level is as follows: each block is strengthened by three staff nurses, one auxiliary nurse midwife and five doctors, whereas PHCs are supported by two staff nurses, one auxiliary nurse midwife and two doctors. Each sub centre is supported by one ASHA/VHN. In total, a block has 35 healthcare professionals.

Subjects were enrolled based on eligibility criteria using simple random sampling until a sample of 25 was reached in each block, for a total of 100 health professionals included in the study across the four blocks.

The selected subjects were interviewed face-to-face. A questionnaire was administered to each study subject. The aim was explained to each subject in their local language before it began, and written informed consent was obtained in both English and Tamil.

Informed written consent was taken from all study subjects. No pressure coercion was exerted on subjects for participation in the study. Confidentiality and privacy was ensured at all stages (Institutional Ethical Committee clearance was obtained from GTMC-IEC).

The data were analysed using the Statistical Package for the Social Sciences (SPSS, IBM) software, version 21. For qualitative variables, proportions were calculated, and for quantitative variables, the mean, median, range and standard deviation were calculated. Descriptive statistics were calculated and the results are presented in a pie chart. To test the hypothesis and find the association, a chi-square test was performed. A p-value of <0.05 was considered significant. Cronbach's alpha was used to test internal consistency. Logistic regression analysis was used to identify the association between the dependent variable (factors affecting IMNCI) and the independent variables (age and years of experience).

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Results

This study included a total of 100 healthcare professionals. Among the study population, 58% were male. Regarding the age of the respondents, more than half (69%) were aged between 31 and 40 years. In terms of occupation, most of the respondents (55%) were staff nurses, 20% were auxiliary nurse midwives (ANMs), and the rest were doctors (15%). More than half of the respondents (119, or 59.2%) had worked as healthcare providers for less than five years. Of these, 92 (92%) worked in an outpatient department for less than five years (Table 1).

Table 1

Sociodemographic Characteristics of the Study Participants

Variable	Category	Frequency, %
Age	21-30	20
	31-40	69
	41-50	11
	Total	100
Gender	Male	58
	Female	42
	Total	100
Occupational status	Doctor	25
	Staff Nurse	35
	Auxiliary Nurse Midwife	20
	Accredited Social Health Activist	20
	Total	100
Work experience	Less than 5 years	64
	More than 5 years	36
	Total	100
Work in under 5 clinic	Yes	92
	No	8
	Total	100

Regarding IMNCI training, nearly 79% of respondents had attended IMNCI training at different times; however, less than half of these participants (21%) had not attended any training after joining the service. Almost 86% of the study participants had not received any follow-up training in the last two years (Table 2).

Table 2

Status of Health Care Workers on IMNCI Training

Questions	Options	Response frequency, %
Have you attended any IMNCI training?	Yes	79
	No	21
Which period of the last IMNCI training have you received?	Less than 1 years	19
	1-2 years	14
	More than 2 years	67
Have you received any follow-up training?	Yes	14
	No	86
Which period of the last follow-up training have you received? (N=14)	Less than 1 years	0
	1-2 years	0
	More than 2 years	14

Table 3 shows the steps in the case management protocol that were difficult to apply. More than half of the study participants reported that they always found all steps in the IMNCI case management protocol difficult to apply. Out of the six steps in the IMNCI case management protocol, nearly half (58%, 57%, 51% and 47%) found the steps “Provide follow-up”, “Identify the treatment”, “Classify the child’s illness” and “Assessment of child' and Follow-up of child” the most difficult, respectively.

Table 3

Attitude on Case Management Protocol among Study Participants

Questions	Response frequency, %		
	Always	Sometimes	Not difficult
Do you find it difficult to provide follow-up?	7	46	47
Do you have enough time to counsel the carer?	35	32	33
Are you confident in treating the child?	60	19	21
Are you able to identify the correct treatment?	10	32	58
Do you find it difficult to classify the child as ill?	7	42	51
Do you find it difficult to assess the child?	7	36	57
Do you find it difficult to apply the steps in the case management protocol?	26	70	4
Implementing all stages of IMNCI	80	16	4
Implementing most stages of IMNCI	67	25	8

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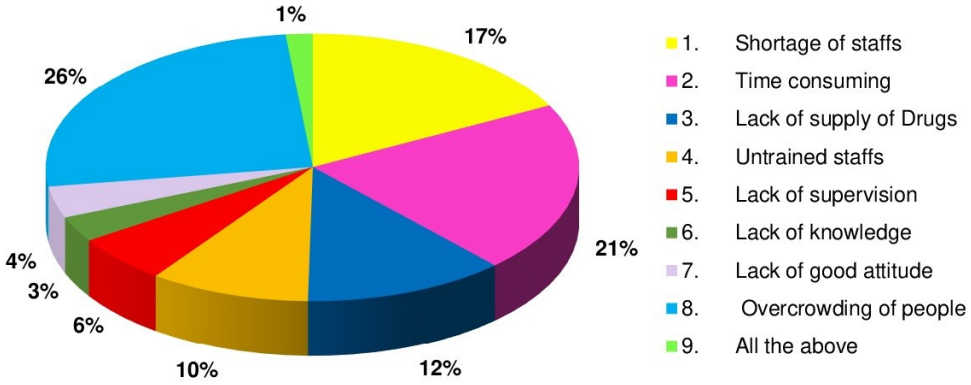
When asked about the factors influencing the implementation of case management skills based on the IMNCI strategy, respondents reported overcrowding (67 people, or 26%), time-consuming processes (56 people, or 21%), lack of trained staff (84 people, or 17%), and lack of supplies (70 people, or 12%) as the main challenges of IMNCI implementation (see Figure 1).

Figure 1

Distribution of Factors Influencing the Implementation of Case Management Skills



More than half of the study participants did not always perform the following checks: vaccination (67%), temperature (52%), signs of pallor (50%), danger signs (50%), fever (73%), malaria (52%), cough (52%), weight (83%), weight against chart (87%), ear problems (95%). The 10-item scale measuring attitude towards practices on IMNCI among the study participants demonstrated acceptable internal consistency (Cronbach's alpha value: 0.978).

The attitudes of the study participants towards IMNCI practices are outlined in Table 4.

Table 4

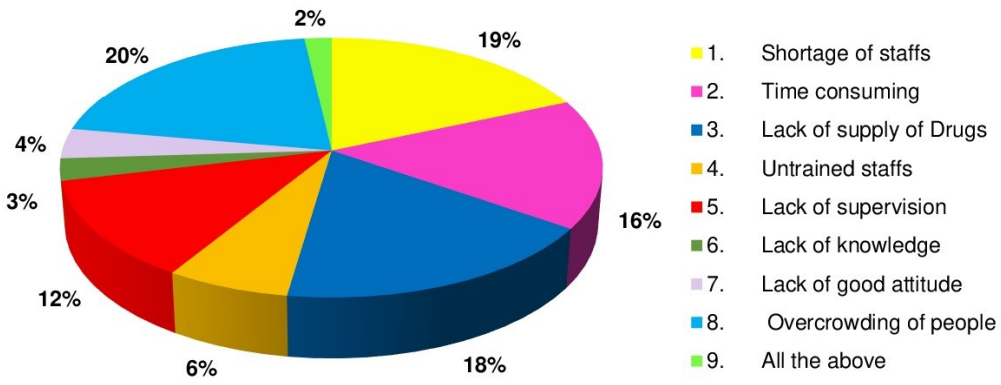
Attitudes towards IMNCI Practices among Study Participants

Questions	Response frequency, %		
	Always	Sometimes	Not performed
Are you checking the child's vaccination status on their immunisation card?	17	16	67
Are you taking their temperature?	20	28	52
Are you looking for signs of pallor?	16	24	50
Are you assessing the child based on danger signs?	27	23	50
Do you ask about symptoms related to malaria?	16	11	73
Do you assess the nature of the cough?	21	27	52
Do you weigh the children at every visit?	17	31	52
Do you plot the child's weight on a growth chart?	2	15	83
Do you check the child's ears for discharge or ear problems?	1	12	87
Do you check for signs of malnutrition?	0	5	95

In terms of the factors influencing IMNCI strategy implementation, 57 respondents (20%) cited overcrowding as the main challenge, 24 respondents (19%) cited a lack of staff, 31 respondents (18%) cited a lack of supply of cards, and 81 respondents (16%) cited the time-consuming nature of the process. Figure 2 presents the main challenges of IMNCI implementation.

Figure 2

Distribution of Factors Influencing the Implementation of IMNCI Practices



The attitude of healthcare providers towards treating ARI based on the algorithm: overall, 71% of respondents exposed the children's chest to count their respiratory rate. While counting the respiratory rate for a full minute, only 14% of respondents performed this task for the full duration.

More than half of them did not properly assess high-risk cases (44%), classify the illness based on symptoms and signs (31%), or treat the child (54%) based on the colour coding of acute respiratory infections according to IMNCI.

Health education on routine immunisation and breastfeeding was reported to be given to children in 55% and 67% of cases, respectively. Advice on the danger signs of pneumonia, preventing infections and coming for a follow-up appointment if symptoms worsened was not routinely given to children attending PHCs (Table 5).

Table 5

Attitudes of Healthcare Providers towards Treating Acute Respiratory Infections Based on the Algorithm

Statements	Response frequency, %		
	Always	Sometimes	Not performed
Exposing the chest for counting the respiratory rate	21	8	71
Counting the respiratory rate for one minute	14	6	80
Counting the respiratory rate for less than one minute	66	30	4
Identifying any high-risk infants	26	30	44
Classifying them according to colour coding	24	45	31
Managing them based on their category	12	34	54
Providing proper counselling on preventing infections	19	60	21
Providing health education on exclusive breastfeeding	55	33	12
Providing health education on routine immunisation	67	18	15
Telling them about the danger signs of pneumonia	32	47	41
Asking the mother to come for a follow-up if the symptoms worsen	28	55	17

The attitude of healthcare providers towards treating ADD based on the algorithm was reported by the majority of respondents. However, when it came to checking for signs of dehydration such as dry mouth and the skin pinch test, as well as taking blood pressure, these were performed consistently in only 7%, 17% and 25% of cases, respectively. More than half of them did not properly assess high-risk cases (52%), classify the illness based on symptoms and signs (57%), or treat the child (58%) based on colour coding for acute respiratory infection according to IMNCI. Health education on routine immunisation and breastfeeding was reported to be given to children in 66% and 70% of cases, respectively.

Counselling on the proper use of ORS and the preparation of homemade ORS was routinely performed. Advice on the danger signs of diarrhoea, preventing infections, and coming for a follow-up appointment if symptoms worsened was routinely given to children attending PHCs (Table 6).

Table 6

Attitude of Healthcare Providers towards Treating ADD Based on the Algorithm

Statements	Response frequency, %		
	Always	Sometimes	Not performed
Checking for signs of dehydration:	-	-	-
- Dry mouth/tongue	7	66	27
- Skin pinch test	17	32	51
- Blood pressure	25	31	44
Identifying any high-risk infants	21	27	52
Classifying according to colour coding	14	29	57
Managing based on category (1, 2 or 3)	19	23	58
Providing proper counselling on preventing diarrhoea	25	54	21
Providing advice on ORS usage and uses	59	26	15
Providing health education on exclusive breastfeeding	70	21	9
Providing health education on routine immunisation	66	25	9
Preparing homemade ORS	35	32	33
Providing advice on proper handwashing	23	54	23
Telling the mother about the danger signs of dehydration	22	42	36
Asking the mother to come for a follow-up if the symptoms worsen	57	22	21

According to the study, 65% of participants agreed that the IMCI strategy is user-friendly for health workers. Regarding the idea that the IMNCI protocol is easy to understand and apply, only 31% of respondents strongly agreed; more than half of them (60%) disagreed. Of the total respondents, 63%, 70% and 66% strongly agreed that the IMNCI protocol is too long, tedious and not practical for our health facility, and time consuming, respectively (Table 7).

Table 7
Attitudes of Healthcare Providers towards Implementing the IMNCI Strategy

Statements	Response frequency, %		
	Strongly Agree / Agree	Neither agree / Nor disagree	Disagree / Strongly disagree
IMNCI is user-friendly	65	25	10
IMNCI is easy to understand and apply	31	9	60
IMNCI protocol is tedious	63	27	9
IMNCI is time-consuming	70	7	23
IMNCI is not practical for our health institution	66	21	13

Let us consider the following significant factor: time spent managing an under-5 patient when using the IMNCI case management protocol (Table 8). According to this study, 11% of respondents strongly agreed that they spent more than one hour using the IMNCI protocol, whereas 30% strongly disagreed/disagreed with spending between 30 and 45 minutes using the IMNCI protocol. Based on this study, 54% of respondents agreed that they spent between 11 and 30 minutes using the IMNCI protocol, which is in line with the WHO-recommended consultation time of 15–20 minutes.

Table 8
Time Spent Managing a Child under Five When Using the IMCI Case Management Protocol

Statements	Response frequency, %		
	Strongly Agree / Agree	Neither agree / Nor disagree	Disagree / Strongly disagree
Time spent managing a child under the age of five:	-	-	-
More than 1 hour	11	34	55
30-45 min	46	24	30
11-30 min	54	16	30
1-10 min	9	25	66

Regarding the availability of resources, 38% of respondents strongly agreed that IMNCI drugs are frequently out of stock. In contrast, only 24% disagreed with the statement that IMNCI wall charts and chart booklets are frequently unavailable. In terms of health facility equipment, 42% strongly agreed/agreed that their health facility is not fully equipped to support the use of the IMNCI strategy. The attitude of the study participants regarding the availability of resources is outlined in Table 9.

Table 9
Attitudes towards the Availability of Resources among the Study Participants

Statements	Response frequency, %		
	Strongly Agree / Agree	Neither agree / Nor disagree	Disagree / Strongly disagree
IMNCI drugs are often out of stock	38	17	45
IMNCI wall charts and the accompanying booklet are also often unavailable	45	31	24
Health facilities are not fully equipped to support the use of IMNCI	42	38	20

The majority of respondents (64%) either agreed or strongly agreed with the statement that their supervisor does not understand the rationale behind IMNCI. Similarly, 28% of respondents disagreed or strongly disagreed with the statement that their supervisor is not IMNCI-trained.
Among the study participants, 66% agreed with the statement about a lack of supervision by IMNCI trainers, while 13% disagreed with the statement that there is a lack of supervision by IMNCI trainers for the proper implementation of IMNCI (see Table 10).
Regarding the lack of follow-up training by IMNCI facilitators, the majority of respondents (76%) strongly agreed that this is the main challenge to implementing the strategy.

Table 10
Attitudes towards Supervision when Implementing IMNCI

Statements	Response frequency, %		
	Strongly Agree / Agree	Neither agree / Nor disagree	Disagree / Strongly disagree
The supervisor does not appreciate the rationale behind IMNCI	64	20	16
The supervisor is not IMNCI-trained	48	24	28
There is a lack of supervision by IMNCI trainers	66	21	13

Discussion

This study aimed to identify the implementation of the Integrated Management of Neonatal and Childhood Illnesses (IMNCI) programme and the factors influencing its implementation by healthcare workers (HCWs) in rural health centres in Thiruvarur, South Tamil Nadu.

A total of 100 HCWs were included in the study. Of these, 79% had attended IMNCI training at various points in their careers, but less than half (21%) had not received any further training after joining the service. Almost 86% of the study participants had not received any follow-up training in the last two years. This finding is consistent with a study conducted by Abebe et al. (2019). However, this finding is higher than that of a study conducted in Tanzania, which showed that only 43% of health workers were IMNCI-trained (Isangula et al., 2023).

The study participants reported that they always found all steps in the IMNCI case management protocol difficult to apply. Out of the six steps in the IMNCI case management protocol, nearly half found the steps 'Provide follow-up', 'Identify the treatment', 'Classify the child's illness', 'Assessment of the child' and 'Follow-up of the child' difficult to apply. This finding is consistent with a study by Abebe et al. (2019).

A facility survey conducted in Nigeria showed that few sick children were fully assessed and that only 43.8% were correctly classified by health workers. The use of antibiotics for sick children was also high and not in accordance with the guidelines (Afolalu, 2020).

Regarding the factors influencing the implementation of case management skills based on the IMNCI strategy, some respondents reported overcrowding, time-consuming processes, a lack of trained staff and a lack of supplies as the main challenges of IMNCI implementation.

Similarly, several factors were identified as hindering IMNCI implementation. These include untrained staff (56.2%), lack of supervision (27.4%), lack of supplies (37.3%), poor attitude (11.9%) and shortage of staff (16.4%). A study by Seid et al. (2019) identified similar factors, including lack of supplies (37.3%), frequent unavailability of IMNCI drugs (43.8%), lack of wall charts and chart booklets (39.4%), and unequipped health facilities (49.7%).

Our results were inconsistent with those of a study conducted in Botswana, which showed that only 10% of respondents agreed that IMNCI-recommended drugs were often out of stock, and 15% claimed that IMNCI chart booklets and wall charts were often unavailable in their health facilities. Meanwhile, 56% of participants responded that their health facilities were not fully equipped to support the application of IMNCI skills and procedures (Renosa et al., 2020). This difference may be due to differences in socio-economic status, the study area, and sample sizes.

In the current study, more than half of the participants agreed that they were carrying out routine steps such as checking vaccination status, taking temperatures, looking for signs of pallor or danger, assessing fevers, malaria and coughs, weighing children and checking their weight against a chart, and checking for ear problems. Examining the factors influencing the implementation of the IMNCI strategy, we found overcrowding, lack of staff and supplies, and time constraints to be the main challenges.

A survey conducted in Afghanistan and Indonesia identified the following challenges to implementing the IMNCI strategy: short training duration, lack of ongoing follow-up and clinical supervision, high training costs, lack of political support, lack of human and material resources and time, poor health worker reading ability, mismatch between training needs and available resources, frequent health worker turnover, and poor IMCI implementation quality by those specifically trained in the use of job aids and protocols for assessment, classification, treatment and counselling (Mayhew et al., 2015; Titaley et al., 2014).

One study conducted in Indonesia categorised the factors affecting IMNCI implementation into three levels: health worker, facility and community. The main challenge at the health worker level is the health worker's perception of skills uptake and case management guidelines, while the main challenges at the facility level are time constraints (time taken to complete the protocol, long queues and short staffing) and inadequate facility support (medical equipment, job aids and drugs). At the community level, the main challenges to implementing IMNCI guidelines were identified as long waiting times, high user fees and non-compliance by caregivers and patients (Haryanti et al., 2022).

The attitude of healthcare providers towards treating acute respiratory infections (ARI) based on an algorithm was examined. While counting respiratory rate for a full one minute, only 14% of providers performed this task for the full duration. Classification of ARI based on symptoms and signs was reported in only 31% of cases, and treatment of the child based on colour coding according to IMNCI was found to be less than 44%. Health education on routine immunisation and breastfeeding was provided in 55% and 67% of cases, respectively. Advice on the danger signs of pneumonia and how to prevent infections, as well as advice on coming for a follow-up appointment if symptoms worsened, was not routinely given to children attending PHCs.

This is inconsistent with a study carried out in Panchkula district. Overall, 77.9% of children had their chest exposed in order to count their respiratory rate. The respiratory rate was counted for a full minute in 47.4% of children, and for less than a minute in 28% (29.8%). The respiratory rate was not counted at all in 22% of children. 20% of children were treated with medication only, while the remaining 80% were treated with medication and counselling (Venkatachalam et al., 2012).

The attitude of healthcare providers towards treating ADD based on the algorithm was reported by the majority of respondents as not regularly checking for signs of dehydration, such as dry mouth and the skin pinch test, or taking blood pressure. More than half of them did not properly assess high-risk patients, classify illnesses based on symptoms and signs, or treat children

based on the colour coding of acute diarrhoeal diseases according to IMNCI. Health education on routine immunisation and breastfeeding was reported to be given to children 66% and 70% of the time, respectively. Counselling on the proper usage of ORS and the preparation of homemade ORS was routinely performed. Advice on the danger signs of diarrhoea, preventing infections and coming for a follow-up if symptoms worsened was always or sometimes given to children attending PHCs.

This is consistent with a study conducted in Panchkula by Venkatachalam et al. (2012), in which the dehydration of 93.3% of children was assessed by pinching their abdominal wall. 40% of mothers were advised to give their children extra food and fluids, and 66.7% were advised to give ORS and told how much to give. Only 26.7% of mothers were shown how to prepare ORS, and 21.4% were advised how much to give. Children with diarrhoea were given medicine only in 46.7% of cases, and counselling was provided alongside medicine in 53.3% of cases.

According to this study, 65% of respondents either agreed or strongly agreed that the IMCI strategy is user-friendly for health workers. Regarding the idea that the IMNCI protocol is easy to understand and apply, only 31% of respondents strongly agreed; more than half disagreed. Of those who agreed with the notion that the IMNCI protocol is too long, tedious and impractical for our health facility, many also felt that it was time consuming.

Similar results were reported in a study (Bharani et al., 2012), which identified various IMNCI-related barriers to implementation by healthcare workers, such as the IMNCI protocol being too long (59.7%), tedious (41.3%), time-consuming (55.2%), and difficult to understand and apply (11.0%).

According to the present study, 11% of respondents strongly agreed or agreed that they spent more than one hour using the IMNCI protocol, while 54% strongly agreed or agreed that they spent between 11 and 30 minutes using the IMNCI protocol, which is consistent with the WHO's recommended consultation time of 15–20 minutes. This is consistent with a study by Subedhi et al. (2024), which found that the average consultation in this study was also in line with the WHO's recorded average of 16 minutes. IMNCI consultations were about 2–4 minutes longer than traditional consultations. Similarly, several other studies have also identified these factors as barriers to the implementation of the IMNCI protocol.

Regarding the availability of resources, 38% of respondents strongly agreed that IMNCI drugs were frequently out of stock, while only 24% disagreed with the statement that IMNCI wall charts and chart booklets were frequently unavailable. Concerning health facility equipment, 42% strongly agreed/agreed that their health facility is not fully equipped to support the IMNCI strategy. Among the study participants, 66% agreed with the statement that there is a lack of supervision by IMNCI trainers for the proper implementation of IMNCI, while 13% disagreed.

Primary health care nurses at selected clinics in Nepal cite the following difficulties in implementing IMNCI: lack of resources and poor working conditions; lack of human resources; lack of material resources; and shortage of medication.

The absence of computers at clinics and the lack of physical resources are categorised as a lack of resources, while the lack of support from supervisors, burnout related to a lack of support from stakeholders, a lack of cooperation from community members, a lack of support from the media, a lack of political support, and symptoms related to work overload are categorised as poor working conditions, which have a negative impact on nurses (Subedi et al., 2024). Similar consistent results (Haryanti et al., 2022) have identified inadequate facility support (medical equipment, job aids and drugs) as a challenge at the facility level.

Conclusions

This study identifies factors affecting the uptake and implementation of IMNCI from the perspective of frontline healthcare providers. Our review revealed that the experiences of HCWs in implementing IMNCI were characterised by the demotivating realities of an unsupportive healthcare system, lack of resources, and weak programme execution with no proper follow-up training.

The following bottlenecks were recognised as hindering the reach of IMNCI in the community: imperfect supervision and monitoring mechanisms; inadequate availability of basic equipment and drug supplies; an inefficient referral system; poor training in terms of quality and duration; a lack of regular reinforcement of guidelines; and poor performance of healthcare staff. In order to improve the quality of child health services provided by PHC workers in less developed countries, efforts should focus not only on resource-intensive structural improvements, but also on cheap, cost-effective measures.

These measures should include the proper use of national guidelines for case management and meaningful supervision. Government leadership, along with more structured and continued support in terms of resources and training, is necessary to foster sustainable IMNCI healthcare services that meet the needs of the local community.

Acknowledgments

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Ethical Approval

Clearance from the Institutional Ethical Committee (GTMC-IEC, No. 050/IEC/GTMC/2023) was obtained.

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LETTER TO THE EDITOR

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LETTERS TO THE EDITOR

LETTER TO THE EDITOR

Psychological Rehabilitation and/or Dehabilitation: What Role Do They Play in a Psychologist's Work?

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Abstract

Background and Aim of Study: *In modern psychology, the study of processes that restore and maintain psychological health occupies an important place. Psychological rehabilitation and dehabilitation are two key concepts closely related to this field. While rehabilitation aims to restore impaired mental functions, social skills, and emotional balance in the client, dehabilitation reflects the opposite process – the gradual or sudden loss of adaptive abilities due to trauma, chronic stress, disorders, or adverse social conditions.*
The aim of the study: to determine the relationship between psychological rehabilitation and dehabilitation for effective planning of psychological interventions, adjusting psychotherapeutic strategies, and predicting the dynamics of a client's condition.

Conclusions: *With the skillful and qualified work of a psychologist, psychological rehabilitation and dehabilitation are complementary processes. Rehabilitation helps restore lost functions and skills, while dehabilitation helps the client adapt to a new condition, reducing the impact of impairments on their lives.*

Keywords: *psychological rehabilitation, dehabilitation, integration, adaptive abilities, dysfunctional behavior patterns*

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Dear Editor,

In modern clinical psychology and psychotherapy, increasing attention is being paid to a comprehensive approach to restoring mental health and adaptive capacity. Traditionally, the primary focus has been on the rehabilitation of people with disabilities. However, in recent years, the social model of disability has become outdated, and specialists are increasingly turning to the concept of dehabilitation as a necessary component of comprehensive psychotherapy (Goering, 2015). Understanding the relationship between these processes opens new perspectives for effective psychological care.

According to researchers, psychological rehabilitation is a systematic process of restoring or developing psychological functions, skills, and abilities lost or impaired due to illness, injury, or adverse life circumstances. This process is designed to optimize an individual's social functioning, self-care, and social integration (Barbato & D'Avanzo, 2016; Kallivayalil & Varughese, 2020).

The primary objectives of psychological rehabilitation are to restore or compensate for impaired mental functions, develop adaptive coping strategies, enhance social interaction skills, and improve quality of life and subjective well-being. A variety of methods are employed in the rehabilitation process, including cognitive-behavioral therapy, social skills training,

psychoeducational programs, art therapy, body-oriented practices, and group psychotherapy (Koch & Rumrill, 2016; Singha, 2024; Stadnik et al., 2019).

An essential aspect of rehabilitation is its multi-level nature. At the cognitive level, attention, memory, thinking, and other mental processes are restored. The emotional level includes work on affect regulation and overcoming anxiety and depression. The behavioral component focuses on developing functional behavior patterns, while the social level aims to restore communication skills and social connections (Koch & Rumrill, 2016).

Essentially, rehabilitation is, first and foremost, a process of improving the quality of the body's restorative and compensatory processes, consciously correcting their course, taking into account the consequences for life (Singha, 2024). A further humanization of psychosocial support for clients characterizes modern trends in psychological rehabilitation. An essential task for the psychologist when working with a client is to establish an optimal and acceptable balance between the degree of rehabilitation of the lost function and the possible impairment of other systems. That is, in each specific case, it is necessary to determine the price the body will pay for the restoration of a given function during rehabilitation (Haegele & Hodge, 2016; Lecardeur et al., 2025).

Here, in our opinion, the clinical psychologist must consider the client's dehabilitation process (Riddle, 2020). Dehabilitation, essentially, is a decrease in a person's functional capacity leading to the inability to perform habitual actions. It can also be caused by ineffective psychotherapy, a fixation on losses, or other errors in the psychologist's work. Here, this process must proceed in a targeted and managed manner, gradually replacing dysfunctional behavior patterns with healthier and more productive strategies for the client's functioning in society (Melnyk & Stadnik, 2018). Of particular importance is the weakening or elimination of acquired helplessness and a passive life position, which develop as a result of prolonged exposure to a state of impairment (Levitt, 2017; Owens, 2015). Also significant is the rejection of the disability identity, when the client overidentifies with the role of the patient or victim, which hinders their recovery (Malka, 2025).

Essential aspects of the managed dehabilitation process are:

- reducing dependence on external assistance;
- reducing the impact of disability on the client's life;
- developing social and psychological activity despite limitations (Odame et al., 2025).

Let us consider specific examples of the interaction of rehabilitation and dehabilitation in the process of a psychologist's work. When working with post-traumatic stress disorder, dehabilitation involves gradually weakening the avoidance behavior and hypercontrol that initially protected the psyche from re-traumatization. Concurrently, rehabilitation work is conducted to develop affect regulation skills, integrate the traumatic experience into life history, and restore a sense of safety. In the case of depressive disorders, dehabilitation aims to disrupt Beck's cognitive triad, which includes negative ideas about the self, the world, and the future, as well as to reduce passive, avoidant behavior. The rehabilitation component includes behavioral activation, developing problem-solving skills, and developing the ability to enjoy activities. When working with addictions, dehabilitation involves breaking down the psychological defense system and denying behavioral patterns associated with psychoactive drug use. At the same time, rehabilitation focuses on developing healthy coping strategies, developing emotional regulation, and building supportive social relationships (Marques & Queiros, 2021).

Effective integration of rehabilitation and dehabilitation requires, in our opinion, adherence to the following methodological principles:

The principle of consistency suggests that the degree of dehabilitation should correspond to the individual's readiness for change and the availability of alternative resources. Too rapid a destruction of pathological defense mechanisms without the development of substitute strategies can lead to crisis and regression.

The principle of individualization requires consideration of the unique characteristics of the individual, their resources, developmental history, and current state. What is dysfunctional for one person may be adaptive for another.

The principle of active client participation assumes that all processes should be carried out with the client's conscious participation and desire. Forced dehabilitation or rehabilitation is ineffective and can lead to increased resistance.

The principle of systems requires consideration of all levels of individual functioning and their social environment, since changes at one level inevitably affect others.

Conclusions

In conclusion, I would like to discuss the specific problems and limitations of this context. One of the primary challenges is determining the optimal pace and balance of these processes for a particular client. Too intensive dehabilitation without sufficient rehabilitation support can lead to decompensation, while focusing exclusively on rehabilitation without addressing dysfunctional patterns leads to superficial changes.

Another challenge is the need to address resistance at multiple levels. Resistance can manifest not only at the individual level but also at the systemic level, when the client's immediate circle derives secondary benefit from maintaining their disability. In such cases, it is necessary to extend therapeutic work to the client's family.

There are also limitations related to the severity and nature of the disorder. In cases of severe organic brain damage or severe psychotic states, dehabilitation options may be significantly limited, and the focus must shift to rehabilitating intact functions and adapting to limitations. In such cases, setting realistic therapeutic goals is essential (Singha, 2024).

Thus, psychological rehabilitation and dehabilitation, when performed by a skilled and qualified psychologist,

are complementary processes. Rehabilitation helps restore lost functions and skills, while dehabilitation helps the client adapt to a new condition, reducing the impact of impairments on their lives.

Ethical Approval

The study protocol was consistent with the ethical guidelines of the 1975 Declaration of Helsinki as reflected in a prior approval by the Institution's Human Research Committee.

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Conflicts of Interests

The author declares that there is no conflict of interests.

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