

COMMUNICATIVE, SOCIOMEDICAL, PSYCHOLOGICAL, AND PEDAGOGICAL FACTORS INFLUENCING THE FORMATION OF PREVENTIVE HEALTH BEHAVIOR RELATED TO NEUROSURGICAL DISEASES AMONG UNIVERSITY STUDENTS

Yakhshiboyeva Gulbakhor Oybek kizi^{1*}, Boltabayeva Ozodaxon
Yuldashaliyevna², Mirzayev Kamol Karimovich³, Mirzakarimov
Bahromjon Khalimjonovich³, Razzakova Nargis
Yuldashevna⁴, Jo'rayeva Shaxlo Baxtiyor qizi⁵, Saidova Muxabbatxon
Shukrullayevna⁶

¹Associate Professor, Andijan State Medical Institute, Andijan, Uzbekistan |

ORCID: <https://orcid.org/0000-0003-1022-2216> | Email: daminovamubina@gmail.com

²Head of the Department of Languages, Tashkent Branch of the University of Business and Science; Doctor of Philosophy (PhD) in Philological Sciences, Associate Professor, Tashkent, Uzbekistan

³Andijan State Medical Institute, Andijan, Uzbekistan

⁴Tashkent State University of Uzbek Language and Literature named after Alisher Navoi; Doctor of Philosophy in Sociology, Senior Lecturer, Tashkent, Uzbekistan |

ORCID: <https://orcid.org/0000-0002-9718-3610>

⁵Teacher, Department of Social and Humanitarian Sciences, University of Business and Science, Tashkent, Uzbekistan | ORCID: <https://orcid.org/0009-0009-1240-3310> | Email: joyayevashaxlo23@gmail.com

⁶Candidate of Philological Sciences, Associate Professor, Department of Uzbek Linguistics, Faculty of Philology, Namangan State University, Namangan, Uzbekistan

³Professor, Department of General Surgery and Transplantology (Mirzayev Kamol Karimovich)

³Head of the Department of Pediatric Surgery (Mirzakarimov Bahromjon Khalimjonovich) |

ORCID: <https://orcid.org/0000-0003-4597-2738> | Email: mirzakarimovbahromjon@gmail.com

*Corresponding Author: Yakhshiboyeva Gulbakhor Oybek kizi |
Email: daminovamubina@gmail.com

Abstract

Preventive health behavior among university students has become an important research focus in contemporary higher education, public health, psychology, pedagogy, and neurosurgical prevention discourse. The student period is a critical stage in which long-term lifestyle habits, attitudes toward health, stress-management skills, learning behavior, and patterns of decision-making are formed. In this context, the prevention of neurosurgical and neurological risk factors, including head and spinal injuries, sedentary lifestyle, poor posture, chronic stress, sleep disorders, and delayed medical consultation, requires an interdisciplinary approach.

This article examines the communicative, sociomedical, psychological, and pedagogical factors influencing the formation of preventive health behavior related to neurosurgical health among university students. The study is based on a conceptual-analytical approach and integrates perspectives from health literacy research, health communication, sociology of health, psychology of behavior, pedagogy, higher education studies, and preventive neurosurgery. The article argues that preventive health behavior is shaped not only by access to medical knowledge, but also by communicative competence, psychological

readiness, emotional self-regulation, social environment, digital health literacy, value orientations, and institutional educational practices.

Particular attention is given to the role of interpersonal communication, media and digital information use, social support, physical activity, posture culture, injury prevention, stress management, sleep hygiene, and educational context in promoting health-conscious decisions among students. The paper proposes an interdisciplinary framework in which communicative, sociomedical, psychological, and pedagogical factors operate as interconnected determinants of preventive behavior. The findings suggest that effective health promotion in higher education should combine neurosurgical awareness with psychological support, communication-based education, and socially grounded pedagogical strategies.

The article concludes that universities should adopt integrated approaches aimed at strengthening students' health literacy, critical thinking, communicative competence, psychological resilience, preventive culture, and awareness of neurosurgical risk prevention.

Keywords: preventive health behavior, university students, neurosurgical prevention, neurological health, health literacy, health communication, sociomedical factors, psychological factors, pedagogical factors, communicative competence, higher education, student health culture.

Introduction

Preventive health behavior among university students has become an important topic at the intersection of public health, higher education, psychology, pedagogy, and preventive neurosurgical care because the student period is a critical stage for the formation of long-term lifestyle patterns, health-related attitudes, psychological self-regulation, and decision-making skills. In this context, preventive behavior is particularly relevant to neurosurgical and neurological health, as students may be exposed to risk factors such as head and spinal injuries, poor posture, sedentary lifestyle, chronic stress, sleep disturbances, excessive screen use, and delayed medical consultation.¹

Health literacy is widely understood not only as the ability to obtain health information, but also as the capacity to understand, evaluate, and apply it in everyday life, which makes it a key determinant of informed preventive behavior [1][2]. From a neurosurgical prevention perspective, health literacy enables students to recognize early warning signs of neurological disorders, understand the importance of injury prevention, maintain spinal health, seek timely medical advice, and avoid behaviors that may increase the risk of neurotrauma or chronic neurological complications.

Foundational work by Nutbeam conceptualized health literacy as functional, interactive, and critical, thereby linking it to communication, social participation, and conscious decision-making rather than to information processing alone [1]. This approach is especially important in the psychological and pedagogical context of higher education, where students' preventive behavior is shaped by their motivation, emotional stability, stress resistance, learning environment, communication skills, and ability to critically assess health-related information. Later integrative models further emphasized that health literacy includes access, understanding, appraisal, and application of health-related information across healthcare, disease prevention, and health promotion contexts [2]. These components are directly connected with the development of preventive culture, including awareness of neurological and neurosurgical risks, responsible lifestyle choices, and readiness to participate in health-promoting educational activities.

Among university students, health literacy is especially significant because this population is exposed to increasing autonomy, lifestyle experimentation, academic stress, intensive digital information consumption, and changing patterns of social interaction. A systematic review of cross-sectional studies found that health literacy among university students is often lower than expected and varies substantially across populations and contexts, with implications for health-related decision-making and behavior [3]. In relation to neurosurgical health, insufficient health literacy may contribute to ignoring symptoms such as persistent headache, dizziness, back pain, sleep problems, neurological discomfort, or consequences of

¹ Nutbeam D. Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. *Health Promotion International*. 2000;15(3):259-267.

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minor head trauma. Therefore, psychological support, pedagogical guidance, and effective communication strategies are necessary for helping students transform medical knowledge into stable preventive habits.

In addition, recent evidence suggests that digital health literacy among postsecondary students is associated with disease prevention practices, health information seeking, and other behavioral outcomes, although the strength of these associations varies across settings and measures [4]. This is particularly relevant to neurosurgical and neurological prevention, since students often obtain information about symptoms, injuries, posture, stress, sleep, and brain health from online sources. Without critical digital literacy, they may rely on inaccurate or non-scientific information, delay professional consultation, or develop unnecessary anxiety about health conditions. For this reason, the educational environment should support students in evaluating digital health information, communicating with healthcare professionals, and developing psychologically balanced attitudes toward disease prevention.

These findings indicate that preventive health behavior among students should be interpreted through an interdisciplinary lens that includes not only health knowledge, but also communication, digital literacy, psychological readiness, pedagogical influence, and the broader educational environment [1][2][4]. In the context of neurosurgical prevention, such an approach allows universities to promote students' awareness of neurotrauma prevention, spinal health, posture culture, stress management, sleep hygiene, physical activity, and timely medical consultation. Thus, preventive behavior should be viewed as a complex outcome formed through the interaction of medical awareness, psychological self-regulation, communicative competence, and pedagogically organized health education.

Literature Review

The literature increasingly shows that preventive health behavior is shaped by both communicative and sociomedical determinants. Communicative determinants include health literacy, communicative competence, and digital health literacy, all of which affect how students interpret preventive recommendations and translate them into everyday action [1][2][4]. The review by Kühn et al. demonstrated that university students' health literacy levels differ considerably and that many studies report lower scores than expected, especially outside health-related majors [3]. This suggests that health literacy cannot be assumed to develop automatically within higher education and may depend on broader educational and communicative support structures [3].

Digital health literacy has become especially important because students rely heavily on online and social media sources for health information. A recent systematic review found that eHealth literacy among postsecondary students is associated with preventive practices and information-related outcomes, although measurement inconsistencies remain a challenge [4]. This supports the view that the ability to distinguish reliable digital information from misinformation is a core part of preventive health behavior in contemporary student life [4]. At the same time, communicative dimensions of health literacy are also relevant. Recent population-based evidence indicates that communicative health literacy has an independent association with health behavior and healthcare utilization, which strengthens the argument that communication-related skills should be treated as predictive rather than secondary variables [5].

The role of digital communication has become particularly significant. University students are among the most active users of online information sources, including social media, video platforms, blogs, and health websites. While digital media can improve access to health information, it can also expose students to misinformation, oversimplified narratives, or non-scientific advice. This makes digital health literacy an important dimension of preventive behavior. Students must be able not only to find information, but also to verify its reliability and integrate it into practical decisions.

Sociomedical factors also play an essential role. These factors include socioeconomic background, family influence, peer networks, institutional culture, social support, access to healthcare services, and the broader educational environment. Sociomedical determinants shape the conditions under which preventive behavior becomes possible, meaningful, and sustainable. For example, a student may understand the benefits of physical activity but still fail to engage in it due to lack of time, facilities, social encouragement, or psychological support.

Physical activity, nutrition, and mental health practices are commonly discussed as behavioral outcomes, but they are also indicators of broader health culture. Students' preventive actions often emerge as part of a complex lifestyle pattern rather than as isolated behaviors. Therefore, the study of preventive

health behavior requires attention to the interconnectedness of medical, communicative, social, and educational influences.

Although many studies address separate aspects of health literacy, communication, and student well-being, fewer works integrate communicative and sociomedical determinants into a single explanatory framework. This article contributes to that need by offering an interdisciplinary perspective on how preventive health behavior is formed among university students.

Methodology

This article is based on a conceptual-analytical research design. The study relies on theoretical interpretation, comparative analysis, and interdisciplinary synthesis of research related to preventive health behavior, health literacy, health communication, psychological determinants, pedagogical approaches, sociomedical factors, and preventive neurosurgical care in higher education.

Conceptual Framework of Preventive Health Behavior Among University Students

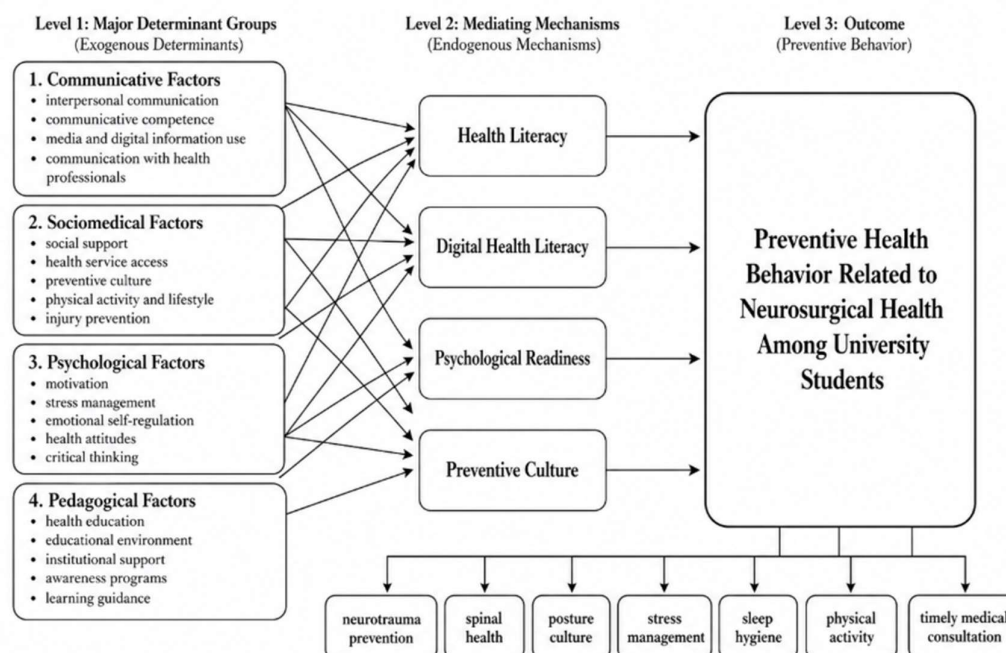


Figure 1. Conceptual Framework of Communicative, Sociomedical, Psychological, and Pedagogical Factors Influencing Preventive Health Behavior Related to Neurosurgical Health Among University Students

The methodological basis of the article includes the analysis of scientific literature on student health, preventive culture, neurosurgical and neurological risk prevention, communication in health contexts, psychological self-regulation, pedagogical influence, and social factors affecting health-related decision-making. The selected body of literature was examined in order to identify recurring concepts, explanatory patterns, and relationships among the main variables. Particular attention was paid to studies discussing university students as a specific social group characterized by transition, autonomy, academic stress, lifestyle experimentation, increased digital information consumption, and intensive interpersonal communication processes.

The analytical procedure involved three stages. First, the core conceptual categories were identified: preventive health behavior, communicative competence, health literacy, digital health literacy, psychological readiness, pedagogical support, sociomedical environment, and awareness of neurosurgical and neurological risk prevention. Second, the relations among these categories were examined in light of interdisciplinary scholarship from public health, psychology, pedagogy, health communication, sociology of health, and preventive neurosurgical perspectives. Third, these relationships were integrated into a conceptual framework explaining how communicative, sociomedical, psychological, and pedagogical factors contribute to the formation of preventive behavior among students, particularly in relation to neurotrauma prevention, spinal health, posture culture, stress management, sleep hygiene, physical activity, and timely medical consultation.

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Because this article is conceptual in nature, it does not present original statistical data. Instead, it develops a theoretically grounded interdisciplinary model intended to guide future empirical research and practical interventions in higher education settings. The proposed approach may be useful for designing educational programs aimed at strengthening students' health literacy, communicative competence, psychological resilience, responsible lifestyle behavior, and awareness of neurosurgical and neurological health risks.

Results

The analysis shows that preventive health behavior among university students is formed under the influence of four interconnected clusters of determinants: communicative, sociomedical, psychological, and pedagogical factors. In the context of neurosurgical health, these determinants play an important role in shaping students' awareness of neurotrauma prevention, spinal health, posture culture, sleep hygiene, stress management, physical activity, and timely medical consultation.

The first cluster, communicative factors, includes communicative competence, interpersonal communication, health literacy, and digital health literacy. These factors affect how students receive, understand, evaluate, and apply health-related information, including information about neurological and neurosurgical risks. Students with stronger communicative skills are more likely to seek clarification, verify information, participate in meaningful discussions, consult healthcare professionals, and translate knowledge into preventive action. Communication thus functions not merely as a channel of information transfer, but as a mechanism of behavioral formation.

Within this cluster, health literacy occupies a central position. It links access to information with practical decision-making. Students who possess higher levels of health literacy are more capable of interpreting preventive recommendations, understanding medical advice, recognizing early warning signs, and evaluating the consequences of risky behavior. In relation to neurosurgical health, this may include awareness of symptoms such as persistent headache, dizziness, back pain, sleep disturbances, neurological discomfort, or the consequences of head and spinal injuries. Communicative competence strengthens this process by enabling students to navigate dialogue, ask questions, and critically engage with both professional and non-professional sources.

Digital health literacy extends this mechanism into the online environment. Since students often rely on internet-based content, their ability to distinguish reliable medical information from misleading, exaggerated, or manipulative content becomes a major predictor of preventive behavior. This is especially important in the field of neurological and neurosurgical prevention, where inaccurate online information may lead either to delayed medical consultation or to unnecessary anxiety. In this sense, digital communication competence influences both knowledge and action.

The second cluster, sociomedical factors, includes social support, peer influence, educational environment, institutional health culture, socioeconomic conditions, access to preventive healthcare resources, and opportunities for physical activity. These factors create the structural and relational context within which preventive behavior develops. A supportive educational environment can normalize healthy lifestyles, encourage safe physical activity, promote responsible attitudes toward mental and physical well-being, and strengthen awareness of neurotrauma and spinal health prevention. Conversely, an environment characterized by stress, indifference, low health awareness, or lack of health infrastructure may weaken preventive behavior even when students possess adequate knowledge.

Peer influence emerges as a particularly strong sociomedical factor. Students often model their behavior on peer norms, shared routines, and group expectations. If healthy practices such as regular physical activity, correct posture, adequate sleep, stress management, timely medical consultation, and responsible use of healthcare services are socially valued, preventive behavior is more likely to be reinforced. If harmful habits such as prolonged sedentary behavior, ignoring pain symptoms, unsafe physical activity, sleep deprivation, and self-treatment are normalized, the opposite effect may occur.

The third cluster, psychological factors, includes motivation, emotional self-regulation, stress resistance, health attitudes, self-efficacy, and critical thinking. These factors determine the extent to which students are psychologically ready to transform health knowledge into stable preventive behavior. Academic stress, anxiety, emotional instability, and low motivation may reduce students' ability to maintain healthy routines even when they understand their importance. From the perspective of

neurosurgical health, psychological readiness is especially relevant because chronic stress, poor sleep, physical inactivity, and delayed response to symptoms may contribute to long-term neurological and musculoskeletal problems.

The fourth cluster, pedagogical factors, includes health education, learning guidance, awareness programs, teacher-student interaction, institutional support, and the organization of the educational environment. Pedagogical influence is important because preventive behavior is not formed spontaneously; it requires systematic explanation, repetition, motivation, and practical integration into student life. Universities can promote preventive health behavior through educational modules, seminars, physical activity programs, psychological counseling, digital literacy training, and awareness campaigns focused on neurotrauma prevention, spinal health, posture culture, sleep hygiene, and stress management.

Determinant group	Main components	Role in preventive behavior
Communicative factors	Communicative competence, interpersonal communication, health literacy, digital health literacy	Help students receive, understand, evaluate, and apply health information correctly
Sociomedical factors	Social support, peer influence, access to healthcare, university health culture	Create a supportive environment for healthy lifestyle and timely medical consultation
Psychological factors	Motivation, stress management, emotional self-regulation, critical thinking	Strengthen students' readiness to turn health knowledge into daily preventive habits
Pedagogical factors	Health education, awareness programs, teacher guidance, institutional support	Organize systematic learning and promote preventive culture in higher education
Outcome	Neurotrauma prevention, spinal health, posture culture, sleep hygiene, physical activity	Forms preventive health behavior related to neurosurgical health among students

Table 1. Key determinants of preventive health behavior related to neurosurgical health among university students

The analysis also suggests that communicative, sociomedical, psychological, and pedagogical factors are not separate but mutually reinforcing. For example, students may develop stronger preventive behavior when reliable communication is supported by a positive social environment, psychological readiness, and pedagogically organized health education. Likewise, a university health culture becomes more effective when students are equipped with the communicative skills, critical thinking, and digital literacy necessary to engage with it actively and responsibly.

As a result, the study proposes an interdisciplinary model in which preventive health behavior related to neurosurgical health is understood as the outcome of the interaction among health literacy, communicative competence, digital health literacy, psychological readiness, social environment, and institutional educational conditions. This model demonstrates that the formation of preventive behavior among students should be approached not only as a medical issue, but also as a communicative, psychological, pedagogical, and sociomedical process.

Discussion

The findings of this conceptual analysis confirm that preventive health behavior among university students cannot be reduced to individual knowledge alone. A student may be informed about the importance of exercise, healthy eating, regular sleep, or medical check-ups, yet still fail to follow preventive practices if communicative and sociomedical conditions are weak. This indicates that health-related behavior must be interpreted as a socially situated and communicatively mediated process.

One of the major implications of the proposed model is the need to reconsider the place of communication in student health promotion. Communication should not be understood only as a tool for delivering information. It is a formative process through which meanings, attitudes, and decisions are developed. Students' ability to interpret health messages, engage in discussion, evaluate risks, and interact

with professionals is central to their preventive orientation. This makes communicative competence a key educational target.

The discussion also highlights the significance of the university as a sociomedical environment. Higher education institutions influence student lifestyles through curriculum design, campus culture, extracurricular activities, counseling services, sports infrastructure, and informal peer interaction. Therefore, preventive health behavior should be promoted not only through separate awareness campaigns, but through a broader institutional culture that integrates health into educational life.

The role of digital environments deserves special attention. In contemporary student life, online communication increasingly shapes perceptions of health, body image, self-care, and risk. Digital platforms can support preventive behavior by increasing access to evidence-based information, but they can also undermine it through misinformation or superficial trends. For this reason, universities need to strengthen digital health literacy as part of their general educational mission.

Another important point concerns the interdisciplinary nature of the problem. Since preventive health behavior is influenced by medical, communicative, and social factors simultaneously, single-discipline approaches are insufficient. Educational programs that combine health education with communication training, critical media literacy, sociological reflection, and practical health-promoting activities are likely to be more effective.

The scientific value of this article lies in its effort to integrate communicative and sociomedical determinants into a unified framework. Its practical value lies in offering a basis for developing educational and preventive strategies adapted to the realities of modern student life.

Conclusion

The formation of preventive health behavior among university students is a complex and multifactorial process shaped by both communicative and sociomedical determinants. Preventive behavior depends not only on medical awareness, but also on the ability to interpret and apply health information, engage in effective communication, evaluate digital sources, and function within a supportive social and educational environment.

The article has shown that communicative competence, health literacy, digital health literacy, peer influence, social support, and institutional educational culture are among the most important factors affecting the development of preventive health behavior in university settings. These determinants interact with one another and should therefore be studied and addressed in an integrated way.²

From a practical perspective, universities should promote preventive health behavior through interdisciplinary strategies that combine medical education, communication development, critical digital literacy, and the strengthening of student health culture. Such an approach would allow higher education institutions not only to inform students about health, but also to create the social and communicative conditions necessary for sustained preventive action.

Future research may build on this conceptual framework by testing the proposed relationships empirically and identifying the strongest predictors of preventive behavior in different student populations.

References

1. Nutbeam D. Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. *Health Promotion International*. 2000;15(3):259-267.
2. Sørensen K, Van den Broucke S, Fullam J, Doyle G, Pelikan J, Slonska Z, Brand H. Health literacy and public health: a systematic review and integration of definitions and models. *BMC Public Health*. 2012;12:80.

² Kühn L, Bachert P, Hildebrand C, et al. Health literacy among university students: a systematic review. *Frontiers in Public Health*. 2022;9:680999.

3. Pelikan JM, Ganahl K, van den Broucke S, Sørensen K. Health literacy in Europe: comparative perspectives. *European Journal of Public Health*. 2015;25(6):1053-1058.
4. World Health Organization. *Health Promotion and Health Literacy*. Geneva: WHO.
5. Kühn L, Bachert P, Hildebrand C, et al. Health literacy among university students: a systematic review. *Frontiers in Public Health*. 2022;9:680999.
6. Studies on university students' health literacy during the COVID-19 period and the role of misinformation in health-related decision-making.
7. Nutbeam D. The evolving concept of health literacy. *Social Science and Medicine*.
8. Research on communicative health literacy and its influence on health behavior and healthcare use.
9. Studies on eHealth literacy among postsecondary students and its association with preventive decision-making.
10. Systematic review of physical activity and physical fitness among university students.
11. Research on physical activity, sedentary behavior, and educational outcomes in higher education.
12. Chao DP. Health-promoting lifestyle and its predictors among university students. *BMC Public Health*.
13. Studies on health-promoting behavior, sleep, nutrition, and lifestyle characteristics among students.
14. Research on the relationship between health communication and health literacy in the digital era.