Research article/Araştırma makalesi

Structured Environmental Safety Assessment in a High School Using the Omaha System
Omaha Sistemi Kullanılarak Bir Lisede Çevresel Güvenlik Değerlendirmesi

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Abstract
Objective: This study aimed to determine environmental safety-related risk patterns in a high school from the perspective of final-year nursing students and teachers by using the Omaha System Classification Scheme.
Method: This cross-sectional descriptive study was conducted between January and June 2025 in one public Anatolian high school located in the Western Black Sea region of Türkiye. The school was selected due to the presence of the only actively practicing school nurse in the province during the study period. A total population sampling approach was used within the institution. The analytical sample consisted of 81 participants (13 teachers and 68 final-year nursing students). Data were collected using the Problem Classification Scheme (PCS) of the Omaha System. Environmental safety-related problems were identified and classified within the Environmental domain. Due to subgroup size imbalance and unmet assumptions for inferential testing, analyses were limited to descriptive statistics.
Results: Sanitation deficiencies, presence of infectious contaminants, inadequate heating and cooling systems, unsafe physical structures, overcrowded spaces, traffic-related hazards, and environmental safety threats were among the most frequently identified risk areas. The findings indicate that environmental safety risks within the same institutional setting are multidimensional and structurally embedded.
Conclusion: The use of the Omaha System Problem Classification Scheme enabled standardized documentation of school-based environmental safety risks. Integrating structured classification frameworks into school health practice may strengthen institutional environmental risk surveillance and planning. Multi-center studies across diverse school settings are recommended to examine the broader applicability of this approach.
Keywords: School health services, Omaha system, Environmental safety, School nursing.

Özet
Amaç: Bu çalışma, Omaha Sistem Sınıflandırma Şeması kullanılarak bir lisede çevresel güvenlikle ilişkili risk örüntülerini, son sınıf hemşirelik öğrencileri ve öğretmenlerin bakış açısıyla belirlemeyi amaçlamaktadır.
Yöntem: Bu kesitsel tanımlayıcı çalışma, Ocak–Haziran 2025 tarihleri arasında Türkiye'nin Batı Karadeniz Bölgesi'nde bulunan bir devlet Anadolu lisesinde yürütülmüştür. Çalışma, veri toplama sürecinde ilde aktif olarak görev yapan tek okul hemşiresinin bu kurumda bulunması nedeniyle söz konusu okulda gerçekleştirilmiştir. Kurum içinde tam sayım yaklaşımı benimsenmiştir. Analitik örneklem 13 öğretmen ve 68 son sınıf hemşirelik öğrencisinden oluşan toplam 81 katılımcıyı kapsamaktadır. Veriler, Omaha Sisteminin Problem Sınıflandırma Şeması (PCS) kullanılarak toplanmıştır. Çevresel güvenlikle ilişkili sorunlar Çevre alanı kapsamında sınıflandırılmıştır. Alt gruplar arasındaki sayı dengesizliği ve ki-kare varsayımlarının sağlanamaması nedeniyle analizler tanımlayıcı istatistiklerle sınırlandırılmıştır.
Bulgular: Sanitasyon yetersizlikleri, enfeksiyöz kontaminant varlığı, ısıtma ve soğutma sistemlerindeki eksiklikler, güvensiz fiziksel yapılar, aşırı kalabalık alanlar, trafik riskleri ve çevresel güvenlik tehditleri en sık tanımlanan risk alanları olmuştur. Bulgular, aynı kurumsal ortamda çevresel güvenlik risklerinin çok boyutlu ve yapısal nitelikte olduğunu göstermektedir.
Sonuç: Omaha Sisteminin Problem Sınıflandırma Şeması kullanılarak gerçekleştirilen değerlendirme, okul temelli çevresel güvenlik risklerinin standartlaştırılmış biçimde belgelenmesine olanak sağlamıştır. Yapılandırılmış sınıflandırma çerçevelerinin okul sağlığı uygulamalarına entegrasyonu, kurumsal düzeyde çevresel risk izleme ve planlamayı güçlendirebilir. Farklı okul türlerini kapsayan çok merkezli çalışmalar, bu yaklaşımın daha geniş bağlamlarda uygulanabilirliğini değerlendirmek açısından gereklidir.
Anahtar Kelimeler: Okul sağlığı hizmetleri, Omaha sistemi, Çevresel güvenlik, Okul hemşireliği.

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1. Introduction

School health encompasses all activities aimed at assessing and improving the health of students and school staff, ensuring a safe and healthy environment, and delivering health education (Ministry of Health of the Republic of Türkiye, 2008). Schools are often children's first structured interaction with society, shaping their social skills, beliefs, and worldviews (Seyedin, 2020). Therefore, they are critical settings for promoting healthy behaviors and preventing health risks among children and adolescents (Hansell et al., 2021).

The World Health Organization (WHO) defines the school-aged population as individuals between 5 and 24 years, emphasizing the importance of early health interventions to protect physical, mental, and social well-being (WHO, 2018; Roland et al., 2026). Within this framework, school health is not solely the responsibility of healthcare professionals but is a shared institutional function involving educators, health professionals, and other stakeholders who interact with students on a daily basis. Teachers, in particular, play a key role in observing environmental conditions, recognizing safety risks, and contributing to the identification of health-related concerns within school settings.

School nurses are central actors in school health services, responsible for evaluating student health, identifying risks, implementing interventions, and advocating for health-promoting policies. Their roles include reducing barriers to learning, addressing acute and chronic health conditions, providing basic health services, and supporting the creation of safe school environments (NASN, 2017). However, in many educational settings—especially in low-resource or regionally underserved areas—school nursing services may be limited or absent. In such contexts, environmental safety assessments often rely on the combined observations of teachers and health-related trainees, such as nursing students, who contribute complementary perspectives informed by their professional orientation and training (NASN, 2017; Ilgaz, 2022).

The physical school environment, including building design and infrastructure, directly influences student health and educational outcomes. Poor conditions—such as inadequate lighting, unsafe classrooms, fire hazards, and insufficient first aid resources—can hinder learning and increase health risks (Hawkins et al., 2023). Ensuring environmental safety in schools is thus a fundamental component of public health and educational policy, particularly for the prevention of school-age injuries and the promotion of healthy learning environments (WHO, 2021; Bou-Karroum et al., 2022). Environmental safety includes protection from immediate hazards as well as the recognition and reduction of environmental conditions that may negatively influence health and well-being over time (WHO, 2021; Atak et al., 2023). Systematic and holistic assessments of risks are essential for informed interventions, with nursing diagnoses providing a structured foundation for action. Standardized nursing classification systems, such as the Omaha System, facilitate professional communication, improve care standards, and enhance the visibility of nursing contributions (ANA, 2012; Martin et al., 2011).

There are twelve commonly used standardized nursing terminologies for identifying nursing diagnoses (ANA, 2012). Utilizing standardized nursing classification systems allows nurses to communicate in a shared professional language, improves care standards, supports the collection of more individualized and high-quality data, and enhances the visibility of nurses' contributions. The Omaha System is one of the 12 standardized nursing terminologies recognized by the ANA (ANA, 2012; Martin et al., 2011). The Omaha System provides a structured framework for identifying health problems, documenting nursing interventions, and evaluating outcomes in community-based and public health nursing practice (Monsen & Newsom, 2011; Erdogan et al., 2013).

The Omaha System is a comprehensive, valid, and reliable nursing model frequently used in various

care settings to identify individual health problems, plan interventions, and evaluate care outcomes. It consists of three core components: the Problem Classification Scheme (PCS), which identifies nursing problems; the Intervention Scheme (IS), which documents nursing interventions; and the Problem Rating Scale for Outcomes (PRSO), which measures the magnitude of the problem and evaluates care outcomes (Martin, 2005). In Türkiye, the Omaha System is frequently utilized in public health nursing, both in education (Erdoğan and Esin, 2006), clinical practice (Erdoğan et al., 2013; Kaya et al., 2020), and research (Ilgaz, 2022; Kolac et al., 2025). These studies have demonstrated the system's effectiveness in guiding nursing interventions and assessing health problems, interventions, and outcomes in a structured and meaningful way (Erdoğan et al., 2013; Kaya et al., 2020; Kolac et al., 2026).

Despite its widespread use in community and public health nursing, the application of the Omaha System to school-based environmental safety assessment remains limited, particularly in studies incorporating multiple stakeholder perspectives. Understanding how different institutional actors—such as teachers and nursing students—identify and interpret environmental safety risks within the same school context may provide valuable insight into institutional risk patterns and support more comprehensive and collaborative school health planning. This study addresses this gap by applying the Omaha System Problem Classification Scheme to conduct a structured environmental safety assessment within a single high school, incorporating the observations of teachers and final-year nursing students within a shared institutional environment.

1.1. Aim

This study aimed to determine environmental safety-related risk patterns in a high school from the perspective of final-year nursing students and teachers by using the Omaha System Classification Scheme.

1.2. Research Questions:

- Which environmental safety problems are identified and classified within the Environmental domain of the Omaha System Classification Scheme in a high school setting by final-year nursing students?
- Which environmental safety problems are identified and classified within the Environmental domain of the Omaha System Classification Scheme in a high school setting by teachers?

2. Materials And Methods

2.1. Research Design

This study employed a cross-sectional descriptive design to assess environmental safety risk using the Omaha System Classification Scheme within a high school setting. A cross-sectional approach was selected because it enables the systematic documentation of risk patterns at a defined time point without manipulation of variables, thereby allowing the identification of existing environmental safety concerns within the institutional context (Creswell & Creswell, 2022).

2.2. Setting and Participants

The study was conducted between January and June 2025 in a single Anatolian high school located in Bartın, Türkiye. The school provides both daytime education and residential accommodation.

At the time of the study, this school was the only educational institution in the city employing an actively practicing school nurse. No other school nurse was working in the province during the data collection period. Therefore, the study setting was determined by this structural workforce characteristic rather than convenience alone. The environmental assessment was conducted in the

institution where the school nurse was employed, as this setting allowed professional contextual validation of Omaha-based environmental risk mapping.

2.3. Participants and Sampling Strategy

A total population sampling (census) approach was adopted. All individuals who met the inclusion criteria and were actively present in the school during the data collection period were invited to participate.

The analytical sample included 13 teachers and 68 final-year nursing students, all of whom were engaged in public health clinical placements at the school. Final-year nursing students were included because they had received formal theoretical and practical training in the Omaha System and were engaged in structured environmental assessment as part of their clinical coursework. Their participation ensured standardized risk identification using a common professional framework. Teachers were included as institutional stakeholders with continuous exposure to the school's physical environment and infrastructure, providing experiential observations regarding environmental safety conditions.

Inclusion criteria were:

- Minimum six months of experience in the school environment
- Active presence during the data collection period
- Voluntary informed consent

Although one actively practicing school nurse was employed at the institution, inferential statistical analysis was not performed for this participant due to the single-case structure (n=1). The nurse's assessments were incorporated descriptively to provide contextual validation and professional triangulation of identified environmental risks, but were not included in comparative statistical analyses to avoid methodological bias associated with extremely small subgroup size.

2.4. Data Collection Tool

Omaha System: The Omaha System provides various tools and opportunities for organizing nursing practices, ensuring standardized documentation, transforming clinical data into automated systems, linking clinical data with other types of information, and monitoring the quality of care (Martin, 2005). The structure of the Omaha System is highly compatible with the steps of the nursing process, encompassing the stages of assessment (diagnosis), planning, implementation, and evaluation (Erdoğan et al., 2013).

The Omaha System is a standardized health care terminology composed of the following components:

- Diagnosis = Problem Classification Scheme (PCS)
- Intervention = Intervention Scheme (IS)
- Care Outcomes = Problem Rating Scale for Outcomes (PRSO)

The Problem Classification Scheme (PCS) includes 42 problems categorized under four domains: Environmental, Psychosocial, Physiological, and Health-Related Behaviors. Each problem is defined by signs/symptoms, the scope of the problem (actual / potential / health promotion), and the unit of care it pertains to (individual / family / community). The diagnostic process is completed by identifying and classifying these components (Erdoğan et al., 2013).

In the present study, data were collected using the Problem Classification Scheme (PCS) component of the Omaha System, as the primary objective was structured environmental safety risk identification rather than intervention implementation or outcome evaluation. For the purpose of this study, environmental safety-related problems within the Environmental domain were systematically identified and classified. Each identified problem was coded according to its defined signs/symptoms and scope (actual or potential). Intervention and outcome components of the Omaha System were not applied, as the study focused on cross-sectional environmental risk mapping rather than longitudinal care processes.

2.5. Procedure

Participants received standardized training on the Omaha System PCS to ensure consistent understanding of classification criteria. Following training, teachers and final-year nursing students independently conducted structured environmental assessments within the school using the PCS framework. Responses were collected and coded for descriptive analysis. Although the Omaha System includes intervention and outcome components, these were not utilized in the present study due to its cross-sectional design and focus on environmental risk identification.

2.6. Representativeness and Scope

Because the study was conducted in a single institution determined by the unique availability of a school nurse within the province, findings are context-specific and not intended for statistical generalization. Instead, results provide an in-depth institutional environmental safety mapping within a real-world school health practice setting. The study should therefore be interpreted as a structured situational analysis rather than a population-representative survey.

2.7. Ethical Approval and Considerations

The study was approved by the Ethics Committee of Bartın University, Faculty of Social and Human Sciences (decision date: 08.01.2025, decision number: 2024-SBB-1027), and institutional permission was obtained from the Turkish Ministry of National Education. Participants were informed about the content of the program, their right to withdraw at any time, and that all data collected would be kept confidential and used solely for research purposes. Written informed consent was obtained from all participants following this briefing. The study was conducted in accordance with the principles of the Declaration of Helsinki.

2.8. Data Analysis

Data were analyzed using IBM SPSS Statistics for Windows, Version 26.0. Descriptive statistics (frequencies and percentages) were calculated to summarize environmental safety risk identification patterns across participant groups. Although comparisons between teachers and nursing students were initially considered, inferential statistical analyses (e.g., chi-square tests) were not performed. This decision was based on two methodological constraints:

1. Group size imbalance (13 teachers vs. 68 students), which may compromise statistical stability.

2. Violation of chi-square assumptions, particularly the presence of cells with expected frequencies below 5 in multiple cross-tabulations.

Given these constraints, conducting chi-square analyses would risk inflated Type I or Type II errors and produce statistically unreliable results. Therefore, findings are presented descriptively to accurately reflect observed patterns without overstating statistical inference. The school nurse's data (n=1) were not included in quantitative analysis and were used solely for contextual interpretation.

3. Results

This section presents the environmental safety risks identified in a high school using the Omaha System Problem Classification Scheme. Findings are reported descriptively, reflecting the systematic documentation of environmental risks based on observations from teachers and final-year nursing students. Due to sample size limitations, the school nurse (n=1) was not included in inferential analyses; his observations were incorporated for contextual interpretation only. Therefore, the findings are presented as part of an institutional environmental risk assessment rather than as statistical group comparisons.

3.1. Participant Characteristics

A total of 81 participants were included, comprising 68 final-year nursing students and 13 teachers. Among the nursing students, 60.3% were female and 39.7% were male, while the teacher group included 38.5% female and 61.5% male participants (Table 1). Participants were eligible if they had at least six months of experience within the school and provided informed consent.

Table 1. Gender distribution of participants

Group	Female n (%)	Male n (%)	Total (n)
Nursing Students	41 (60.3%)	27 (39.7%)	68
Teachers	5 (38.5%)	8 (61.5%)	13
Total	46 (56.1%)	35 (43.9%)	**81**

Note: Data are presented descriptively. Percentages represent within-group distributions.

3.2. Economic Conditions

Environmental risks related to economic conditions were identified by both participant groups. Teachers reported that a proportion of students experienced difficulty in managing money (38.5%) and were able to meet only basic needs (53.8%). Similarly, nursing students identified difficulties in money management (13.2%) and limited purchasing capacity restricted to basic necessities (35.3%). Neither group reported lack of health insurance or severe difficulties in meeting basic needs as prominent concerns (Table 2).

Table 2. Economically related risks ıdentified according to the Omaha system

Group	Teacher			Nursing Students		
Economic Condition	Yes	No	Total	Yes	No	Total
Low or no income	1 (7.7%)	12(92.3%)	13 (100%)	2 (2.9%)	66 (97.1%)	68 (100%)
Lack of health insurance	0 (0%)	13 (100%)	13 (100%)	0 (0%)	68 (100%)	68 (100%)
Difficulty managing money	5 (38.5%)	8 (61.5%)	13 (100%)	9 (13.2%)	59(86.8%)	68 (100%)
Able to purchase only basic necessities	7 (53.8%)	6 (46.2%)	13 (100%)	24(35.3%)	44(64.7%)	68 (100%)
Difficulty purchasing necessities	0 (0%)	13 (100%)	13 (100%)	0 (0%)	68 (100%)	68 (100%)

3.3. Sanitation Conditions

Sanitation-related risks were frequently identified across the school environment. Teachers reported issues such as unpleasant odors (76.9%), unclean living areas (69.2%), and the presence of infectious or contaminating agents (61.5%). Nursing students similarly identified unclean environments (57.4%),

unpleasant odors (58.8%), and infectious agents (92.6%). In addition, nursing students reported the presence of mold (19.1%), allergens (7.4%), and limited access to clean water (8.8%), highlighting variability in the observed sanitation risks within the same school setting. Both groups indicated that laundry facilities were generally adequate (Table 3).

Table 3. Sanitation-related risks ıdentified according to the Omaha system

Group	Teacher			Nursing Students		
Sanitation risk	Yes	No	Total	Yes	No	Total
Dirty living area	9 (69.2%)	4 (30.8%)	13 (100%)	39 (57.4%)	29 (42.6%)	68 (100%)
Inadequate food storage and usage	3 (23.1%)	10 (76.9%)	13 (100%)	14 (20.6%)	54 (79.4%)	68 (100%)
Presence of insects/rodents	1 (7.7%)	12 (92.3%)	13 (100%)	4 (5.9%)	64 (94.1%)	68 (100%)
Foul odors	10 76.9%)	3 (23.1%)	13 (100%)	40 (58.8%)	28 (41.2%)	68 (100%)
Insufficient access to clean water	0 (0%)	13(100%)	13 (100%)	6 (8.8%)	62 (91.2%)	68 (100%)
Inadequate sewage system	4 (30.8%)	9 (69.2%)	13 (100%)	2 (2.9%)	66 (97.1%)	68 (100%)
Insufficient laundry conditions	0 (0%)	13 (100%)	13 (100%)	0 (0%)	68 (100%)	68 (100%)
Allergens	1 (7.7%)	12 (92.3%)	13 (100%)	5 (7.4%)	63 (92.6%)	68 (100%)
Infectious contaminant agents	8 (61.5%)	5 (38.5%)	13 (100%)	63 (92.6%)	5 (7.4%)	68 (100%)
Mold	1 (7.7%)	12 (92.3%)	13 (100%)	13 (19.1%)	55 (80.9%)	68 (100%)
Excessive number of domestic animals	0 (0%)	13 (100%)	13 (100%)	0 (0%)	68 (100%)	68 (100%)

3.4. Housing and Physical Infrastructure

Risks related to housing and physical infrastructure were commonly reported. Insufficient heating and cooling systems were identified by both teachers (76.9%) and nursing students (72.1%) as a major concern. Other frequently reported issues included overcrowded living areas, unsafe carpets or mats, cluttered environments, and limited building entry and exit points. Teachers more frequently emphasized overcrowding (84.6%) and unsafe floor coverings (61.5%), whereas nursing students also identified structural barriers and exposed electrical components as notable risks (Table 4).

Table 4. Housing/shelter-related risks ıdentified according to the Omaha system

Group	Teacher			Nursing Students		
Housing/Shelter-Related Risks	Yes	No	Total	Yes	No	Total
Structurally unsound building	0 (0%)	13 (100%)	13 (100%)	4 (5.9%)	64 (94.1%)	68 (100%)
Inadequate heating and cooling	10 (76.9%)	3 (23.1%)	13 (100%)	49 (72.1%)	19 (27.9%)	68 (100%)
Steep and unsafe stairs	2 (15.4%)	11 (84.6%)	13 (100%)	0 (0%)	68 (100%)	68 (100%)
Insufficient/closed building entrances and exits	6 (46.2%)	7 (53.8%)	13 (100%)	16 (23.5%)	52 (76.5%)	68 (100%)
Cluttered living space	6 (46.2%)	7 (53.8%)	13 (100%)	18 (26.5%)	50 (73.5%)	68 (100%)
Unsafe storage of hazardous materials	1 (7.7%)	12 (92.3%)	13 (100%)	8 (11.8%)	60 (88.2%)	68 (100%)
Unsafe carpets/rugs	8 (61.5%)	5 (38.5%)	13 (100%)	10 (14.7%)	58 (85.3%)	68 (100%)
Inadequate safety equipment (alarms, fire extinguishers, etc.)	1 (7.7%)	12 (92.3%)	13 (100%)	4 (5.9%)	64 (94.1%)	68 (100%)
Use of lead-based paint	0 (0%)	13 (100%)	13 (100%)	0 (0%)	68 (100%)	68 (100%)
Unsafe household appliances	0 (0%)	13 (100%)	13 (100%)	5 (7.4%)	63 (92.6%)	68 (100%)
Overcrowded living space	11 (84.6%)	2 (15.4%)	13 (100%)	22 (32.4%)	46 (67.6%)	68 (100%)
Exposed and unprotected electrical cables	3 (23.1%)	10 (76.9%)	13 (100%)	8 (11.8%)	60 (88.2%)	68 (100%)
Structural barriers	3 (23.1%)	10 (76.9%)	13 (100%)	3 (4.4%)	65 (95.6%)	68 (100%)
Homelessness	0 (0%)	13 (100%)	13 (100%)	0 (0%)	68 (100%)	68 (100%)

3.5. Living Area and Workplace Safety

Environmental safety risks related to living and workplace conditions were also documented. Teachers reported high levels of environmental pollution (61.5%), physical hazards (39.5%), and traffic-related risks (69.2%). Nursing students similarly identified traffic hazards (51.5%), environmental pollution (44.1%), and insufficient safe recreational areas (23.5%). Both groups indicated the absence of chemical and radiation-related hazards within the school environment. These findings illustrate the multidimensional nature of environmental safety risks affecting the school setting (Table 5).

Table 5. Living area /workplace safety risks ıdentified according to the Omaha system

Group	Teacher			Nursing Students		
Environmental Safety Risk	Yes	No	Total	Yes	No	Total
High homicide (violence) rate	0 (0%)	13 (100%)	13 (100%)	0 (0%)	68 (100%)	68 (100%)
High pollution level	8 (61.5%)	5 (38.5%)	13 (100%)	30(44.1%)	38(55.9%)	68 (100%)
Uncontrolled dangerous and infected animals	3 (23.1%)	10 (76.9%)	13 (100%)	3 (4.4%)	65(95.6%)	68 (100%)
Insufficient safe play and exercise areas	4 (30.8%)	9 (69.2%)	13 (100%)	16(23.5%)	52(76.5%)	68 (100%)
Inadequate resources and spaces for health promotion	4 (30.8%)	9 (69.2%)	13 (100%)	11(16.2%)	57(83.8%)	68 (100%)
Reports of violence and threats	0 (0%)	13 (100%)	13 (100%)	0 (0%)	68 (100%)	68 (100%)
Physical hazards	5 (39.5%)	8 (61.5%)	13 (100%)	13(19.1%)	55(80.9%)	68 (100%)
Vehicle and traffic hazards	9 (69.2%)	4 (30.8%)	13 (100%)	35(51.5%)	33(48.5%)	68 (100%)
Chemical hazards	0 (0%)	13(100%)	13 (100%)	0 (0%)	68(100%)	68 (100%)
Radiation hazards	0 (0%)	13(100%)	13 (100%)	0 (0%)	68(100%)	68 (100%)

4. Discussion

This study presents a structured environmental safety assessment of a single boarding school using the Omaha System Problem Classification Scheme, with the aim of identifying institutional environmental safety risk patterns rather than conducting statistical comparisons between evaluator groups. Consistent with the revised study aim and design, the findings should be interpreted as a comprehensive, case-based environmental risk mapping derived from multiple informed stakeholder perspectives within a shared school context.

Across all assessed domains, sanitation-related conditions emerged as one of the most prominent environmental safety concerns. Both teachers and final-year nursing students consistently identified unclean living areas, unpleasant odors, and the presence of infectious or contaminating agents. These findings align with a substantial body of literature demonstrating that inadequate water, sanitation, and hygiene (WASH) conditions in school and boarding environments increase the risk of communicable diseases, negatively affect attendance, and compromise overall student well-being (WHO, 2020; Sugita 2022; Jenkins et al., 2025). The identification of mold, allergens, and limited access to clean water by nursing students further underscores the presence of less visible but clinically relevant environmental hazards with potential long-term respiratory and psychosocial implications. Such risks are particularly critical in residential school settings, where prolonged exposure amplifies health impacts.

Housing and physical infrastructure deficiencies constituted another major category of environmental risk. Insufficient heating and cooling systems were frequently reported by both evaluator groups, reflecting challenges in maintaining adequate thermal comfort within school buildings. Previous

research indicates that poor thermal conditions, overcrowding, and substandard building maintenance are associated with decreased concentration, increased fatigue, and higher injury risk among students (Sun et al., 2024; Zomorodian et al., 2016). The presence of overcrowded living areas, unsafe floor coverings, cluttered environments, and limited building entry and exit points further highlights structural vulnerabilities that may compromise daily safety as well as emergency preparedness. These findings emphasize that environmental safety in schools is closely linked to the physical integrity and functionality of institutional infrastructure.

Environmental safety risks related to living and workplace conditions extended beyond indoor spaces and reflected the broader ecological context of the school. Traffic-related hazards, environmental pollution, and insufficient safe recreational areas were commonly identified, indicating that student safety is influenced not only by internal school conditions but also by surrounding environmental factors. Consistent with socio-ecological models of child and adolescent health, external environmental determinants—such as traffic density, proximity to busy roads, and inadequate pedestrian infrastructure—are well-established contributors to injury risk, air pollution exposure, and adverse cognitive and respiratory outcomes (Sadrizadeh et al., 2022; Bou-Karroum et al., 2022). The inclusion of these risks within the Omaha System Environmental domain demonstrates the framework's capacity to capture multidimensional and context-sensitive safety threats relevant to school communities.

Although economic conditions were not identified as severe in terms of unmet basic needs, both teachers and nursing students reported difficulties related to money management and limited purchasing capacity among students. Environmental health equity literature highlights that socioeconomic context shapes both exposure to environmental hazards and perceived vulnerability, influencing how risks are experienced and interpreted within institutional settings. These findings suggest that even moderate economic constraints may interact with environmental conditions to affect student comfort, coping capacity, and engagement, reinforcing the importance of considering socioeconomic context in school health planning and risk communication strategies.

A central methodological contribution of this study is the application of the Omaha System as a standardized framework for environmental safety assessment within a school setting. By systematically organizing diverse environmental observations into a unified classification structure, the Omaha System supports consistent documentation, interpretive clarity, and evidence-informed decision-making. This structured approach is particularly valuable in contexts where school health services and professional school nursing resources are limited. Previous studies have demonstrated that Omaha System–based assessments and interventions can effectively capture health problems and support preventive strategies in school and community settings (Ilgaz, 2021; Atak et al., 2023; Seçginli et al., 2025). In the present study, the Omaha System facilitated the identification of institutional risk patterns across sanitation, housing, physical safety, and environmental conditions, rather than isolated or fragmented observations.

The findings should be interpreted within the limitations of a single-school, cross-sectional design. While generalizability is limited, the case-based approach strengthens internal validity by holding environmental conditions constant and allowing environmental risks to be mapped within a shared institutional context. The inclusion of teachers and final-year nursing students provided complementary perspectives that enriched the environmental assessment process; however, the limited involvement of practicing school nurses restricted the ability to evaluate professional nursing assessments across multiple settings.

From a practice and policy perspective, the results support the integration of structured environmental assessment tools, such as the Omaha System, into routine school health services. Systematic environmental risk identification may enhance interdisciplinary collaboration between educators and health professionals, facilitate targeted preventive interventions, and strengthen institutional capacity to address environmental safety challenges proactively. Future research should expand this approach to multiple schools and educational levels, incorporate student perspectives, and utilize the full Omaha System—including intervention and outcome components—to evaluate the effectiveness of environmental health interventions over time. Despite its limitations, this study contributes to the school health literature by demonstrating the practical utility of a standardized nursing terminology for comprehensive environmental safety assessment within a real-world school context.

4.1. Limitations

This study should be interpreted within several contextual limitations. First, the study was conducted in a single school determined by the structural availability of one practicing school nurse in the province during the study period. Although a census approach was used within the institution, findings are context-bound and not intended for statistical generalization. Second, subgroup size imbalance between teachers and nursing students limited the feasibility of inferential comparisons, and results were therefore presented descriptively. The study was designed as an institutional environmental risk mapping rather than a hypothesis-testing comparison study. Third, the cross-sectional design reflects environmental safety identification at a specific time point and does not allow evaluation of temporal changes or intervention outcomes.

Future research should include multiple school types across different geographic regions and incorporate longitudinal environmental monitoring. Including students and additional school health personnel may further strengthen participatory environmental safety evaluation frameworks.

5. Conclusion And Future Directions

This study conducted a structured environmental safety assessment within a single boarding school using the Omaha System Problem Classification Scheme and systematically mapped environmental safety–related risk patterns within a shared institutional context. Consistent with the study aim and descriptive design, the findings provide an institutional-level overview of environmental safety risks rather than causal or population-level inferences. The assessment revealed that environmental safety risks within the school were multidimensional and distributed across several domains, including sanitation conditions, housing and physical infrastructure, living and workplace safety, and economic conditions. Sanitation-related risks—such as unclean living areas, unpleasant odors, and the presence of infectious or contaminating agents—were among the most frequently identified concerns by both teachers and final-year nursing students. These findings indicate that hygiene- and sanitation-related issues remain prominent environmental challenges in residential school settings and warrant systematic monitoring.

Risks associated with housing and physical infrastructure were also commonly identified. Insufficient heating and cooling systems, overcrowded living areas, unsafe floor coverings, cluttered environments, and limited building entry and exit points were reported as notable concerns. Such conditions may compromise comfort, safety, and emergency preparedness within the school environment, highlighting the importance of infrastructure-focused environmental safety evaluations. Environmental safety threats related to living and workplace conditions extended beyond indoor spaces and included traffic hazards, environmental pollution, and limited access to safe recreational areas. These findings underscore that school environmental safety is shaped not only by internal building conditions but also by surrounding environmental and community-level factors. In contrast,

chemical and radiation-related hazards were not identified as prominent risks, suggesting variability in the distribution of environmental safety concerns across domains. Economic condition–related risks were identified at lower levels compared to other environmental domains. While some students were reported to experience difficulty managing financial resources or meeting needs beyond basic necessities, severe economic deprivation and lack of health insurance were not perceived as major concerns within this institutional context. A key contribution of this study is the demonstration of the Omaha System's applicability as a standardized framework for environmental safety assessment in a school setting. By translating diverse environmental observations into a structured classification scheme, the Omaha System enabled consistent documentation and comprehensive mapping of environmental risks across multiple domains. This structured approach is particularly valuable in settings where school health services and professional nursing resources are limited. Although the findings are specific to a single school and should not be generalized, the study provides methodological insight into how standardized nursing classification systems can support systematic environmental safety assessments in educational institutions. Future research should extend this approach to multiple schools and educational levels, incorporate student perspectives, and utilize the full Omaha System—including intervention and outcome components—to evaluate the effectiveness of environmental health interventions over time. Such efforts may contribute to more comprehensive, evidence-informed strategies for promoting safe and supportive school environments.

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Conflict of Interest

No conflict of interest has been declared by the authors.

Ethical Consideration

I declare that I have complied with scientific and ethical principles in conducting and writing this study and that I have duly cited all the sources used.

Bartın University Social and Human Sciences Ethics Committee, Decision Date: 08.01.2025, Decision Number: 2024-SBB-1027.

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