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Original Article

Cultural Intelligence and Its Relation to Sustainable Management Behaviors among Head Nurses

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ABSTRACT

Background: Cultural intelligence enables head nurses to navigate cultural differences, which not only improves team cohesion and staff well-being but also enriches the delivery of patient care and subsidizes the sustainable management of healthcare resources. **Aim:** To assess cultural intelligence and its relation to sustainable management behaviors among head nurses. **Design:** A descriptive correlational design was utilized to conduct this study. **Setting:** The study was conducted in all inpatient units of the medical and surgical departments at Benha University Hospital. **Subjects:** All available head nurses and their assistants (61) working at the previous setting. **Tools:** Two tools were used for data collection **(I):** Cultural Intelligence Scale and **(II)**: Sustainable Management Behaviors Scale. **Results:** More than half (52.4%) of the studied head nurses had a moderate level of cultural intelligence, and slightly more than three-quarters (75.4%) had sustainable management behaviors. **Conclusion**: There was a highly statistically significant positive correlation between total cultural intelligence and total sustainable management behaviors among head nurses. **Recommendations**: Conducting continuous training programs to improve head nurses' awareness about cultural intelligence for achieving organizational sustainable management behaviors. Additional research is needed to understand the challenges associated with implementing sustainable management in the health-care system.

Keywords: Cultural intelligence - sustainable management behaviors - Head Nurses

Introduction

Globalization and extremely rapid changes have made the health care environment complex, unpredictable, and uncertain, exposing organizations and individuals to culturally diverse workforces that require effective management and encourage employee efforts in developing better adaptive mechanisms to new challenges, which is more important than ever for achieving quality health care standards and a prerequisite condition for sustainability (**Afsar et al., 2020 and Niessen & Lang, 2021).**

Moreover, many healthcare professionals, particularly nursing personnel, now work and live outside of their home nation. Increasing cultural variety emphasizes the value of cultural intelligence in health care. Nurses are responsible to patients, peers, society, and the profession **(Ott**

& Michailova, 2018). Head nurses' cultural intelligence influences the quality of their job performance, which includes clinical decision-making, critical thinking, and knowledge application. As a result, a skilled nurse must be able to understand the viewpoints and needs of a wide range of people in order to be motivated, assisted, and satisfied **(Mohamed, Ahmed, & Abd-Elhamid, 2024).**

Cultural intelligence was described as the ability to apply one's talents and abilities in a variety of circumstances. Cultural intelligence is also the capability to successfully communicate and collaborate in complex, culturally varied settings. To achieve professional goals and operate in a more accommodating environment, emerging leadership styles have emphasized cultural intelligence **(Yari et al., 2020; Livermore et al., 2022).** The ability of head nurses to operate and lead in culturally diverse healthcare environments is known as cultural intelligence. It is a multifaceted concept that addresses circumstances involving cross-cultural interactions brought on by racial, ethnic, and national differences **(Paiuc, 2021)**.

Cultural intelligence includes four dimensions: metacognitive, cognitive, motivational, and behavioral. According to **Shaik et al. (2021)**, metacognitive intelligence refers to the ability to govern one's cognitive processes through learning and remembering knowledge, as well as cultural awareness when interacting with others from different backgrounds. Cognitive intelligence refers to a person's mental capacities that revolve around knowledge, which is a person's cultural awareness of practices, behaviors, and norms in diverse cultural contexts. Motivational intelligence refers to the capability to focus one's attention and energy on a certain problem while being aware of motivating factors, including cultural differences. Behavioral intelligence is the ability to employ motor skills and demonstrate a range **(Kühne, 2023).**

The overarching goals of cultural intelligence are to promote respect for all other cultures, improve intercultural communication, and cultivate a deep understanding of people's multifaceted cultural identities. The development of cultural intelligence has proven to be an effective strategy for addressing systemic, institutional, and individual prejudice. **(Gopal et al, 2021; Vela, Erondu, Smith, 2022)**. Head nurses with a high level of cultural intelligence have extensive knowledge, skills, and abilities that enable them to accurately perceive, understand, analyze, and respond to cultural cues, resulting in increased work engagement and, ultimately, a sustainable work environment **(Greene-Moton & Minkler, 2020)**.

Creating a sustainable work environment is crucial for ensuring patient safety, attracting and retaining nurses, and maintaining financial stability. Sustainability in healthcare refers to the ability to offer services for future generations despite rising demand and financial constraints. Sustainability in nursing is to preserve a healthy environment for present and future generations,

hence promoting sustainable development **(Nyholm et al., 2018; Algabar et al., 2023).**

Sustainable management is the process of integrating sustainability into the activities of an internal healthcare organization. It is the process of developing, implementing, and evaluating decisions and activities that are both environmentally and socioeconomically sustainable, while also taking into account the need to protect resources so that current and future generations benefit. Managers who embrace sustainable management exhibit behaviors such as complying with rules and norms, inspecting sustainable processes, and defining strategic performance goals **(Joseph et al., 2021).** Those professionals are always thinking about how to propose different sustainability initiatives, promote sustainability programs, lead unit management activities, manage teams, assess sustainable performance, and communicate with different departments **(Permana & Hilmi, 2021).**

Sustainable management behaviors encompass four major aspects: company functioning, economic efficiency, environmental sensitivity, and protection sensitivity. Corporate functioning behaviors include behaviors that promote organizational growth, such as the leader's provision of social justice, equal opportunity, and employee satisfaction; they also include developing a vision, involving stakeholders, meeting needs, establishing development goals, fostering unity and solidarity, and preserving internal harmony **(Demirbilek and Çetin, 2021)**.

Economic efficiency behaviors are viewed as safeguarding existing resources, using them productively, saving, and maintaining economic equilibrium. Environmental sensitivity behaviors include environmental and nature protection, sensitivity and initiative, recycling or trash separation, producing and innovating environmentally and nature-friendly products, and raising awareness. Protection-sensitive behaviors, as revealed by several researchers **(Marcos-Merino et al., 2020; Ertz & Patrick, 2020)**.

Managers who demonstrate sustainable behaviors bear a shared accountability for preserving the educational, social, and environmental environments, preventing waste of human and financial resources, and taking care of them. A high degree of cultural and emotional intelligence, sincerity, reflexivity (the capacity to recognize one's own influence and reflection on a situation), inclusiveness and vision, a focus on the good of the collective or the whole, a concern for the welfare of individuals and their lifestyles, systemic and holistic thinking, curiosity and open-mindedness, and skills are all characteristics of leaders who embrace this orientation **(Demirbilek & Çetin, 2021)**.

Significance of the study

As healthcare organizations continue to evolve in an increasingly diverse global context, developing and nurturing cultural intelligence in leadership roles, particularly in nursing, is paramount for achieving both operational excellence and sustainable practices. Cultivating cultural intelligence in nursing leaders can

contribute to healthier work environments, more effective patient care, and a more sustainable healthcare system. In order for head nurses to communicate effectively in cross-cultural settings and maintain long-term employment, they must possess cultural intelligence. When working in a multicultural setting, a head nurse with a high level of cultural intelligence can better understand the quality of other people's behaviors and mindsets **(Nosratabadi et al., 2020).** So, this study is conducted to assess head nurses' cultural intelligence and its relation to their sustainable management behaviors.

Aim of the study

The study aimed to: Assess cultural intelligence and its relation to their Sustainable Management Behaviors among head nurses.

Research questions

1- What are the levels of cultural intelligence among head nurses?
2- What are the levels of sustainability management behaviors among head nurses?
3- Is there a relation between cultural intelligence and sustainability management behaviors among head nurses?

Subjects and Method

Study design:

The aim of the study was achieved by employing a descriptive correlational research design.

Study setting:

The study was conducted in all inpatient's units of medical and surgical departments at Benha University Hospital.

Study Subjects:

The study subjects included all available head nurses and their assistants (61) at the time of data collection who were working in the above - mentioned study setting.

Tools of data collection:

Two tools used to collect data namely:

(Tool I): Cultural Intelligence Scale: It consisted of two parts involving:

Part 1: Personal data of head nurses: Included age, sex, marital status, educational level, years of experience.

Part II: It was developed by **Ang et al., (2007)** and used by researchers to assess head nurses' cultural intelligence. It contained 20 items distributed under four dimensions: metacognitive (4 items), cognitive (6 items), motivational (5 items), and behavioral (5 items).

Scoring system:

Head nurses' responses were measured on a three-point Likert scale; disagree (1), neutral (2), and agree (3). The level of cultural intelligence was considered high if the percent score was >75% of total scores that equal >45 points, moderate ranged from 60 to 75% of total scores that equal (36-45) point, while it considered low was < 60% of total scores that equal <36 points (**Mahmoud, Hassan, & Amer, 2022)**.

(Tool II): Sustainable Management Behaviors Scale (SMBS):

It was developed by **Demirbilek and Cetin (2021)** and was modified by researchers according

to related literature reviews. and used to assess the head nurses' sustainable management behaviors. It consisted of 35 items categorized into four behaviors' subscales involving: corporate functioning (21 items), economic efficiency (5 items), environmental sensitivity (5 items), and protection sensitivity (4 items).

Scoring system

Nurse managers' responses were measured on a 5-point Likert Scale ranging from strongly agreeing (5) to strongly disagreeing (1). The total score was calculated by summing the scores of all categories, then classified according to the statistical cut-off point (**Algabar et al., 2023)**: if the percent was ≥70% is considered sustainable management behaviors and if the percent < was 70%, it refers to unsustainable management behaviors

Procedures

Preparatory phase:

Reviewing the national and international related literature using journals, periodicals, textbooks, the internet and theoretical knowledge of the various aspects concerning the topic of the study for developing the tools and translating the tools into the Arabic language.

Tools validity:

Face and content validity of study tools were done by jury consisting of three experts from different Faculty of Nursing. It included two professors in nursing administration from Benha University and one professor in nursing administration from Tanta University. The modifications were done based on experts' opinions. such as adding omitting the item that gives the same meaning and modifying some words to give the right meaning for the item that was not understood clearly.

Reliability of tools: The reliability of the tools was conducted to determine the internal consistency and homogeneity of the used tools by Cronbach's Alpha test. The internal consistency of cultural intelligence scale was 0.921, and sustainable management behaviors scale (SMBS) was 0.769.

Administrative Approval:

An official authorization was granted by the Dean of the Faculty of Nursing at Benha University to the director of Benha University Hospital, followed by formal consent received from the hospital director permitting the researchers to gather data. This consent was provided after the study's purpose was explained.

Ethical Considerations

Prior to the conduction of the study, the Scientific Ethics Research Committee at Faculty of Nursing -Benha University's granted ethical permission (REC- NA- P66). The researcher was informed that: All subjects' rights were protected by ensuring voluntary participation, so informed consent was obtained by explaining purpose, nature time of conducting the study, potential benefits of the study, how data was collected, expected outcomes. All subjects had the right to withdraw from the research study at any time in case of violation of his/her rights. All data was confidential and informed that it was used only for the research purpose.

Pilot study:

To determine the study tools' applicability and clarity, a pilot study was conducted with 10% of the study participants. The pilot study involved 7 head nurses. Estimating the amount of time required to complete the questionnaires has also been made easier by it. For two tools, it took 20 to 25 minutes on average. Since no changes were required, the sample from the pilot study was incorporated into the study's main subjects.

Field work:

In December 2024, the actual fieldwork was carried out. By interviewing head nurses and outlining the purpose of the study to them, the researchers collected data independently. The data was collected from head nurses before and after work hours based on their availability for two days each week. The number of head nurses interviewed weekly ranged from 5 to 10. The completed forms were gathered on time and double-checked for accuracy to ensure that no data was missing.

Statistical Design:

The Statistical Package for Social Sciences (SPSS version 28.0) was used to revise, code, tabulate, and verify the collected data before computerized entry. Descriptive statistics were applied in the form of mean and standard deviation, frequency, and percentages. The significance of some variables was tested using an independent t-test, and the association between variables was evaluated using linear regression. A p-value of $p<0.05$ was considered statistically significant, a p-value of $p<0.001$ was considered highly statistically significant, and a $P > 0.05$ was considered insignificance.

Results

Table (1): Shows that, the majority (88.5 %) of the studied head nurses were aged between 30-< 40 years old with a mean age of 34.91±3.88years. Also, the majority (82%) of them were females and more than three quarters (78.7%) of them were married. Moreover, more than half (60.6%) of studied head nurses had Bachelor of Nursing Science. For years of experience, about three quarters of them (75.4%, 74.7%) had 10 to < 20 years, with mean 12**.88±3.58** and didn't attend previous workshops about cultural intelligence, respectively.

Table (2): Displays that the total mean scores for all dimensions of head nurses' cultural intelligence were 40.14±5.42. The first ranking of cultural intelligence dimensions was related to the cognitive cultural intelligence dimension with a mean score 12.87±0.98 and the mean percent of 71.5 %. While the last ranking of cultural intelligence dimensions was related to behavioral cultural intelligence with a mean score of 9.10±1.57 and a mean percent of 60.9 %.

Figure (1): Demonstrates that more than half (52.4%) of the studied head nurses had a moderate level of cultural intelligence. Also, more than one-quarter (27.9%) of them had a high level of cultural intelligence. While the lowest percentage (19.7%) of them had a low level.

Table (3): Illustrates that, the total mean scores for all head nurses' sustainable management behaviors were 142.03±13.49. The first ranking of sustainable management behaviors was related to the corporate functioning behavior with a mean score 88.30±5.52 and a mean percent 84.1 %. While the last ranking of sustainable management behaviors was related to environmental sensitivity behavior with a mean score of 18.15±3.48 and a mean percent of 72.6 %.

Figure (2): Indicates that slightly more than three quarters (75.4%) of the studied head nurses had sustainable management behaviors. On the other hand, about one quarter (24.6%) of them had unsustainable management behaviors.

Table (4): Shows that there was highly statistically significant positive correlation between total cultural intelligence and total sustainable management behaviors among head nurses ($P < 0.001$).

Table (1): Distribution of the studied head nurses' regarding their personnel data (n= 61)

Personnel data	No.	%
Age in years		
< 30	2	3.3
30:< 40	54	88.5
≥ 40	5	8.2
Mean ± SD	**34.91±3.88**	
Sex		
Male	11	18.0
Female	50	82.0
Marital status		
Married	48	78.7
Un-married	13	21.3
Educational level		
Nursing Diploma	2	3.3
Associated Degree of Nursing	15	24.6
Baccalaureate of Nursing Science	37	60.6
Post-graduation studies	7	11.5
Years of experience		
< 10 years	11	18.0
10:< 20 years	46	75.4
≥ 20 years	4	6.6
Mean ± SD	**12.88±3.58**	
Attending previous workshops about cultural intelligence		
Yes	13	25.3
No	48	74.7

Table (2): Mean and standard deviation regarding cultural intelligence dimensions among head nurses.

Dimensions	Total score	Minimum	Maximum	M ±SD	%	Ranking
Metacognitive Cultural Intelligence	12	4	12	7.94±1.28	66.2	3
Cognitive Cultural Intelligence	18	6	17	12.87±0.98	71.5	1
Motivational Cultural Intelligence	15	5	14	10.23±1.59	68.2	2
Behavioral Cultural Intelligence	15	5	15	9.10±1.57	60.9	4
Total cultural intelligence	**60**	**20**	**57**	40.14±5.42	**66.7**	

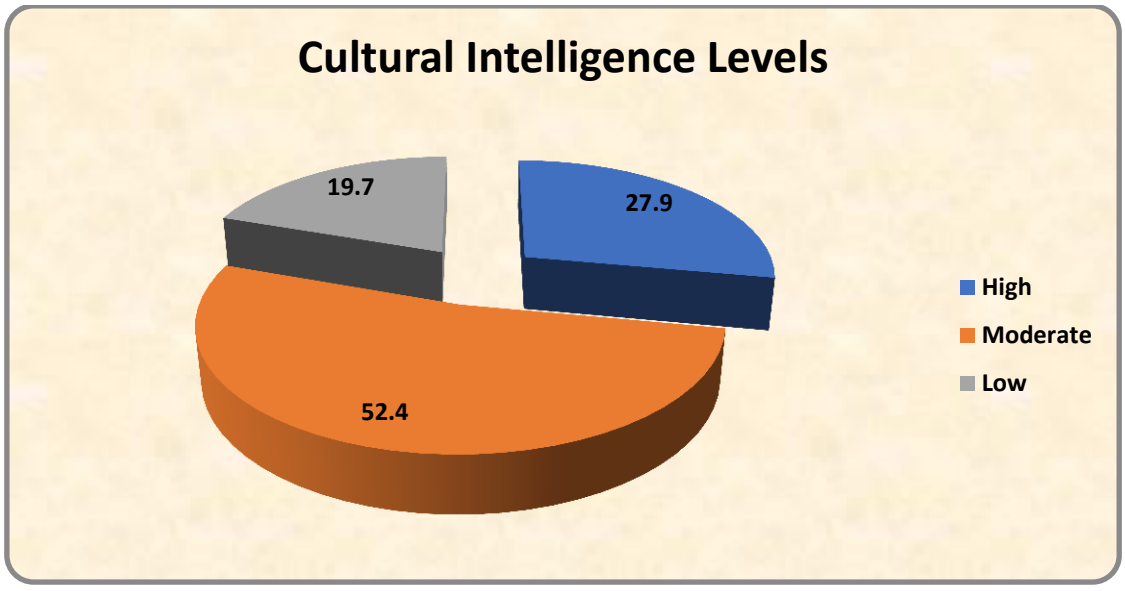

Figure (1): Levels of cultural intelligence among head nurses

Table (3): Mean and standard deviation regarding sustainable management behaviors among head nurses.

Dimensions	Total score	Minimum	Maximum	M ±SD	%	Ranking
Corporate functioning	105	21	102	88.30±5.52	84.1	1
Economic efficiency	25	5	25	19.62±2.07	78.5	3
Environmental sensitivity	25	5	25	18.15±3.48	72.6	4
Protection sensitivity	20	4	18	15.96±2.42	79.8	2
Total sustainable management behaviors	**175**	**35**	**170**	**142.03±13.49**	**81.2**	

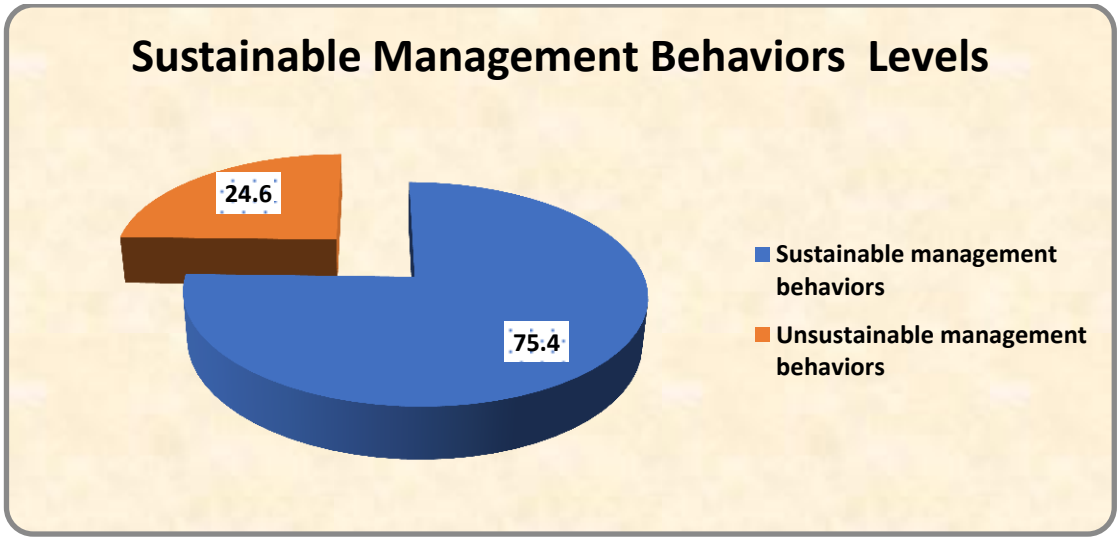

Figure (2): Levels of sustainable management behaviors among head nurses

Table (4): Correlation between total culture intelligence and total sustainable management behaviors among head nurses

Total culture intelligence	Total sustainable management behaviors	
	r	*p-value*
	0.299	0.000**

r= correlation coefficient test. ** Highly statistically significant at p < 0.001

Discussion

In the healthcare sector, head nurses act a pivotal role in shaping the care quality, managing diverse teams, and ensuring sustainable practices within healthcare institutions. As healthcare environments become increasingly multicultural and globalized, head nurses' cultural intelligence has emerged as a crucial factor in enhancing their leadership effectiveness. Cultural intelligence which involves the capacity to perform well in a variety of cultural contexts, may directly influence how head nurses approach sustainable management behaviors, which aim to balance patient care, resource management, and environmental sustainability **(Haskins and Roets, 2022).**

The results of the present study revealed that the majority of the studied head nurses were aged between 30-< 40 years old with a mean age of 34.91±3.88years. Also, the majority of them were females and more than three-quarters of them were married. Moreover, more than half of the studied head nurses had Bachelor of Nursing Science. For years of experience, about three quarters of them had 10 to < 20 years with mean of 12.88±3.58 and didn't attend previous workshops about cultural intelligence.

In relation to the total levels of cultural intelligence among studied head nurses, the results showed that more than half of the studied head nurses had a moderate level of cultural intelligence and more than one-quarter of them had a high level of cultural intelligence. While the lowest percent of them had low level. This could be attributed to the healthcare environment being multicultural, with patients and staff from various cultural backgrounds, which may prompt head nurses to develop better cultural awareness. Those in more diverse settings acquire more cultural knowledge, improving their cultural intelligence.

This result was congruent with **Shokry, Darwish, & Elsawah, (2024); Porkodi et al., (2022)** and **Erçelik et al., (2022) who** established that nurses had moderate levels of cultural intelligence. In the same line, a study conducted by **Mahmoud et al., (2022)** revealed that more than half of the studied nurses had moderate cultural intelligence levels. Also, **Suharti et al. (2019)** who found that the cultural intelligence score for nurses was near the average.

On the other hand, **Mohamed et al., (2024)** determined that the head nurses' levels of cultural intelligence and its subscales were low before the program was implemented. Also, these results were not in the same direction with a study performed by **Abdallh & Mostafa, (2022)** clarified that a high percentage of nurses had a high cultural intelligence level. While **Afsar et al., (2020)** found that staff had low cultural intelligence levels.

The present study's results showed that the first ranking of cultural intelligence dimensions with the highest mean score was related to the cognitive cultural intelligence dimension. While the last ranking of cultural intelligence dimensions with the lowest mean score was related to behavioral cultural intelligence. This could be

explained as knowledge of cultural differences is crucial in healthcare settings. Head nurses need to understand cultural norms, values, and expectations to provide optimal care for diverse patient populations. This reflects the importance of cultural knowledge for decision-making and leadership in diverse environments, while the lower ranking of behavioral cultural intelligence indicates that the ability to modify behaviors may not be as immediately central in a head nurse's role.

The results of the present study were consistent with **Shokry, et al., (2024) who indicated that the** cognitive cultural intelligence dimension of cultural intelligence was reported with the highest mean score among staff nurses. On contrary, **Sousa., et al., (2023)** reported that metacognitive culture intelligent subscale was reported with the highest mean score and the cognitive cultural dimension indicates an average value. **Mahmoud et al., (2022)** point out that the highest mean score was the motivational dimension.

Regarding levels of sustainable management behaviors among head nurses, the present study revealed that slightly more than three quarters of the studied head nurses had sustainable management behaviors. On the other hand, about one quarter of them had unsustainable management behaviors. The reason why the highest percent of head nurses exhibit sustainable management behaviors is likely due to increased awareness, training, attending workshops related to sustainable development and organizational support for sustainability in healthcare, as well as their key role in modeling such behaviors. However, the lowest percent who demonstrate unsustainable management behaviors are likely influenced by factors like resource limitations, external pressures, and barriers to implementing sustainable practices in a high-demand, resource-constrained environment. Balancing the needs of the hospital, patients, and staff while striving for sustainability can be challenging, and these challenges can result in some head nurses engaging in unsustainable practices despite their awareness of the importance of sustainability.

This result aligns with the study by **Algabar et al. (2023)**, which revealed that over sixty percent of nurse managers exhibited a high level of sustainable management practices. In a similar vein, **Abd-Elmonem, Rashed, & Hasanin (2022)** found that approximately two-thirds of nurse managers had a high perception of green human resource management aimed at protecting the environment and encouraging sustainable resource use. Hospitals also provided training programs that encouraged green leadership techniques so that leaders can implement green sustainable management strategies.

On the same scene, this result was in agreement with **Sorour and Elkholy (2021)** who found that most participants exhibited a moderate level of sustainable development behaviors across various categories within the nursing staff. Similarly, **Taie (2023)** noted that perioperative nurses demonstrated a lack of understanding of sustainable development principles, which was

attributed to the focus on high-quality patient care models that did not integrate elements of sustainability. **Fields and Cunningham-Williams (2021)** suggested that nurses were largely unaware of many of the sustainable development goals or even their existence. On the other hand, **Leppanen, et al. (2022**) who revealed a poor level of sustainable development principles among nurse managers.

Furthermore, the current study findings clarified that the first ranking with the highest mean score of sustainable management behaviors among head nurses was related to the corporate functioning behavior. While the last ranking with the lowest mean score of sustainable management behaviors was related to environmental sensitivity behavior. This might be due to head nurses typically holding managerial positions, and their primary responsibility often revolves around the smooth functioning of the healthcare facility or unit such as patient care efficiency, staff performance, and resource utilization. Corporate functioning behaviors directly align with these responsibilities, making them more ingrained in their daily duties. While, the lowest ranking of environmental sensitivity behavior might stem from several factors as they often face budgetary constraints, and sustainability initiatives (such as waste reduction, energy conservation, or green initiatives) may require financial investments, which may not always be prioritized by the organization, especially in resource-limited settings. In addition, operational efficiency and patient care are often prioritized over environmental concerns.

The results align with those of a study by **Algabar et al. (2023),** which indicated that corporate functioning behaviors received the highest mean percent score, while environmental sensitivity behaviors were assigned the lowest mean percent score. This observation contrasts with the conclusion drawn by **Mekawy (2023),** who found that over half of the nurses surveyed had a strong awareness of the dimension of environmental sustainability practices.

The present study founded a highly statistically significant positive correlation between total cultural intelligence and total sustainable management behaviors among head nurses. This result could be due to head nurses with high cultural intelligence are likely better prepared to understand and manage the diverse needs of their team members and patients, leading to more effective and sustainable management behaviors. Cultural intelligence enables them to adjust their leadership style approach to suit various cultural settings. Which can improve team cohesion, communication, and overall organizational performance.

Additionally, head nurses with higher cultural intelligence may have a broader perspective on problem-solving and decision-making. This can contribute to more innovative and sustainable practices in nursing management, as they may consider diverse viewpoints and practices that lead to better long-term outcomes.

This result was reinforced by **Hanges et al. (2016)** who found that leaders with higher cultural intelligence tend to manage diverse teams more effectively, leading to improved performance and more sustainable practices. In healthcare, this comprises creating environments where dissimilar perspectives are esteemed and where management strategies lead to improved staff satisfaction, patient outcomes, and organizational performance.

In the same respect, a study conducted by **Kühne, (2023)** highlighted that cultural intelligence has a direct impact on managerial performances that are closely related to interpersonal dealings and communications. Also, **Garamvölgyi, & Rudnák, (2023**) indicated that managers with higher cultural intelligence are more effective in their leadership roles, and inferred that in teams with substantial cultural variety, a more favorable view of sustainable management performance is influenced by the cultural intelligence of the leaders.

Conclusion

According to the current study's findings, it was concluded that more than half of the studied head nurses had a moderate level of cultural intelligence, and slightly more than three-quarters of them had sustainable management behaviors. In addition, there was a highly statistically significant positive correlation between total cultural intelligence and total sustainable management behaviors among head nurses.

Recommendations

The following suggestions were provided by the researchers in light of the current study's findings:

1. Integration of sustainable development into nursing curricula to raise awareness of students about sustainability and how it affects healthcare organizations.
2. To encourage nurses' vitality in contributing to innovative outcomes, healthcare institutions should create a work atmosphere that fosters sustainability development.
3. Conducting continuous training programs to improve head nurses' awareness about cultural intelligence for achieving organizational sustainable management behaviors**.**
4. All hospitals in the health care system could benefit from more studies on the cultural intelligence of head nurses in order to boost workplace motivation, and career aspirations.
5. Raising the cultural intelligence level among nursing students so that they can become nurses who are self-directed, adaptable, and confident in their abilities.
6. Additional research is needed to understand the challenges associated with implementing sustainable management in the health-care system.

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