

Metacognition and Mindfulness and its Relation to Head Nurses` Decision Making Abilities

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Abstract:

Background: Metacognition and mindfulness are basic leadership capacities and significant factor in decision making for head nurses. It allows head nurses to be aware of the decision making process, know what factors may influence their decisions, and monitor, regulate, adjust and revise their decisions, even before obtaining feedback. **Aim:** Assess relation between metacognition, mindfulness and decision making abilities among head nurses. **Design:** A descriptive correlational design was used. **Setting:** All medical and surgical units at Benha University Hospital. **Subjects:** Convenient sample consisted of head nurses (112). **Tools of data collection:** Three tools were used namely; **I)** Metacognitive Awareness Inventory. **II)** Five Facet Mindfulness Questionnaire **III)** Decision Making Abilities Scale. **Result:** Clarified that (75.0%) of head nurses had high level of metacognition, (62.5%) of them had high level of mindfulness. And (84.3%) of them had high level of decision making abilities. Metacognition, mindfulness affects decision making abilities positively. **Conclusion:** Metacognition and mindfulness was positively statistically significant correlate with decision making abilities among head nurses. **The study recommended that:** Conduct periodic meetings between head nurses and their staff to allow them to express their feelings, seeking opinions, exchange their experiences during different situations and getting feedback and support.

Keywords: Decision making abilities, Head nurses, Metacognition & Mindfulness

Introduction

One of the most important leadership skills for head nurses is metacognition. This skill is the ability to simply observe one's own thoughts, feelings, and actions at critical times, so metacognition allows head nurses to slow down and take enough time when making decisions, allowing for a better understanding of their thoughts, feelings, sensations, and impulses, attempting to prevent acting on automatic mode and reducing errors, especially in critical situations. (Roussel, Thomas & Harris, 2020).

Metacognition is a crucial aspect for head nurses in decision making, problem solving, abstracting, and making appropriate judgement, because it allows them to monitor and regulate their own thinking, be mindful of their knowledge, and optimize their capacities to think, learn, and assess situations. Metacognition can also assist head nurses gain confidence by enhancing decision-making skills and strengthening their capacity to plan and conduct activities in their units with proficiency. (Sieck, 2018). The ability of head nurses to transfer their knowledge into actions is also influenced by metacognition. Metacognitive head nurses continuously integrate different information in their existing knowledge and create links between ideas, leading to a greater comprehension. These abilities are required of head nurses when it comes to developing tasks such as planning, directing,

communicating, and conflict resolution. (Saaris, 2018).

Moreover, metacognition is a trait that distinguishes experienced head nurses from inexperienced ones. Metacognitive head nurses can actively focus attention on relevant information, accurately estimate how well head nurses understand information, compensate for intellectual shortcomings, and use suitable ways to repair errors. It's worth noting that head nurses don't have the same ability to apply metacognition to problem-solving and decision-making as other nurses. Metacognition, on the other hand, can be taught, and as a result, critical thinking, problem-solving, and decision-making abilities improve. (Donohoo, 2018).

Mindfulness is awareness that arises through paying attention, on purpose, in the present moment, non-judgmentally. When being mindful, head nurses are aware of the flow of moment-to-moment experience (thoughts, physical sensations, and emotions) without getting caught up in automatic reactions or positive or negative judgments. It emphasizes accepting things as they are in the present moment and meeting all experiences with openness, curiosity, and compassion. (Sibiya, 2018).

Mindfulness depends on dynamic cooperation of three main components of the metacognition: Metacognitive knowledge, metacognitive experiences and metacognitive skills (Hussain, 2015)

The three elements of mindfulness in communication are: first, an open, non-judgmental attitude; second, being present and paying attention in talks; and third, a calm, non-impulsive manner. These characteristics inherently represent interpersonal attunement **(Choi, Koh, 2015 & Uysl, 2017)**. Head nurses can use mindfulness to recognize their thoughts and intuitions with greater perspective, giving them more choice to choose informed responses over automatic ones. Mindfulness also enhanced staff performance and engagement **(Paul, 2017; Fouts, 2018 & Penque, 2019)**

In health-care organizations, decision-making is a critical managerial function. It is a crucial role for head nurses because they must continually decide what task should be completed, who should complete it, when should it be completed, where should it be completed, and how should it be completed. In comparison to the quality of the decisions, the quantity of the decisions is less essential. If the decisions are not of high quality, it has an impact on the organization's efficiency. It is critical to concentrate on the quality of the judgments made and the amount to which they contribute to the larger mission of the health-care institution. **(Pattanayak, 2018)**. Policies and procedures can never be expected to encompass all aspects of a situation. What do head nurses do when they realize a critical choice cannot be made "by the book?" What do head nurses do when no one can tell them what they should do right away? When they are placed in charge of a situation that requires action, and there are many of these under supervision. In order to solve the above problems and make the best decision, head nurses must use their knowledge. **(Roussel, Thomas & Harris, 2020)**.

The ability to make right and effective decisions that are rational, informed, logic and collaborative can greatly reduce costs while building a strong organizational focus and support the success of health care organization in meeting clients expectations, there for it is important for head nurses to have decision making abilities that enable them to make such effective decisions. Some of these abilities are the ability to gather and select information, finding possible options and solutions, selecting the best option and the ability to evaluate the decision. **(Hussung, 2019)**.

Decision making abilities require head nurses to be experienced and having knowledge in relevant aspects of nursing and consequently, the decision making process becomes easier and more effective. Head nurses are expected to gather information, identify problems, generate alternatives and design and implement innovations that will help their units meet expected patient care outcomes while increasing

efficiency and decreasing costs. **(Maharmeh et al., 2016 & Abd Elghaffar, 2018)**.

Decision making process helps head nurses to solve problems by examining alternative options and deciding on the best solution to take. In real-life situations, decisions can fail because the best alternatives are not clear or key factors are not considered as part of the decision making process. Using a step by step approach is an effective way to make rational, informed decisions that have a positive impact on health care organization's short and long term goals. A clear understanding of best practices can improve the effectiveness of head nurses decisions. **(Hussung, 2017)**.

Head nurses play important role in management of health care organization. Head nurses are key members in decision making team and the link between staff members and higher levels of management. Head nurses also responsible for supervising and coordinating the work of their staff, developing direction, and coordinating care with other services. So the quality of decisions that head nurses make is the yardstick of their effectiveness. **(Bai, 2018)**.

Significance of the Study

Nursing personnel who work in nursing services management spend most of their time analyzing situations and making decisions **(Enfermagem, 2015)**. Often head nurses are faced with making decisions within a short span of time or even simultaneously in complex environments. The complicated nature of the work environment, the multiple activities and responsibilities, both planned and unplanned, present challenges to head nurses to make effective decision. **(Wokke, Cleeremans & Ridderinkhof, 2017)**. Head nurses need to be aware with their thinking, accurately assess their knowledge base and monitor, evaluate, and implement changes to cognitive strategies in order to make effective decisions. Such metacognitive processes enable head nurses to modify ongoing behavior adaptively and determine what to do next in situations in which external feedback is not (immediately) available. And also, to solve problem with creativity, having a great mindfulness awareness for all head nurses make them become more positive, optimistic, take right decision, fully attended mind, help in enjoying life on both sides personal and work life, enhance communication skill as to be mindful means communicating well with others, allow for open channel, clear, concise communication with others **(Hochberg, 2014; Yost, 2015)**

Extensive research exists on clinical decision making processes but there was not research examining the relationship between metacognition, mindfulness and decision making abilities among head nurses. The

findings of the present study will assist fill the gap in identifying the effect of metacognition on head nurses decision making abilities. This could improve head nurses decision making abilities which in turn improve the overall quality of patient care, safety, and patient and staff nurses` satisfaction, while maintaining efficient costs. So, the present study was conducted to assess the relation between metacognition, mindfulness and decision making abilities among head nurses.

Aim of the study

This study was aimed to: Assess the relation between metacognition, mindfulness and decision making abilities among head nurses.

Research Questions

1. What are head nurses` levels of metacognition?
2. What are head nurses` mindfulness levels?
3. What are head nurses` decision making abilities levels?
4. What is the relation between metacognition, mindfulness and decision making abilities among head nurses?

Subjects and Methods

Research design: A descriptive correlational design was used to conduct this study.

Setting: The study was conducted at Benha University Hospital in all Medical, Surgical and Critical Care Units.

Subjects: Convenient sample consisting of the available head nurses (112) who working at the above mentioned setting at the time of study and accepted to participate in the study.

Tools of data collection

Three tools were used for data collection:

First tool: Metacognitive Awareness Inventory:

It was developed by **Schraw & Dennison (1994)** and modified by the investigator after reviewing the related literature (**Yost, 2015, Ata and Abdelwahid, 2019**). It aimed to assess metacognition among head nurses. It contained two parts:

Part (1): Personal data of head nurses including age, gender, department, marital status, nursing educational qualification, years of experience in nursing, and attend training courses in field of decision making and problem solving.

Part (2): It contained 55 items divided into two major domains related to metacognition each domain divided into subscales distributed as the following: knowledge of cognition domain [declarative knowledge (8) items, procedural knowledge (4) items and conditional knowledge (5) items] and regulation of cognition domain [planning (8) items, information management strategies (11) items, monitoring (8) items, debugging strategies (5) items and evaluation (6) items].

Scoring system:

Head nurses responses were measured on three point Likert Scale that ranged from (1) never, (2) sometimes, (3) always. The total score was ranged from 55-165 so that the higher scores indicate a higher metacognition and vice versa. Metacognition level classified as high if total score was equal to 75% or more (124-165) and moderate if total score was equal to 60%- less than 75% (99-123), and low if total scores was less than 60% (98-55).

Second tool: Five Facet Mindfulness Questionnaire (FFMQ)

The FFMQ was developed by **Baer, et al (2006)**. To measure mindfulness among head nurses. It consisted of 39 items. It is divided into 5 dimensions as follows: observe (8 items), describe (8 items), act with awareness (8 items), non-judging (8 items), and non-reactive (7 items).

Scoring system

Head nurses responses was measured using 5 points Likert scale ranging from 1=Never or very rarely true, 2= Rarely true, 3= Sometimes true, 4= Often true, and 5=Very often or always true for positive statement; the score will be reversed in the negative statements. The total score was ranged from [39 to195]. The higher score the greater tendency toward mindfulness, which categorized as following: high if total score was equal to 75% or more (147 to 195), moderate if total score was equal to 60%- less than 75% (117 to 146), and low if total scores was less than 60% (39 to 116).

Third tool: Decision Making Abilities Scale:

It was developed by **Jenkins (1988)** based on clinical decision making in nursing scale and modified by (**Abd Elghaffar, 2018**). It consisted of 43 items to assess decision making abilities of head nurses. It was divided into six subscales: Establishing a positive decision making environment (8) items, generating potential alternatives (7) items, evaluating the alternatives (7) items, choosing the alternatives (8) items, checking the decision (8) items and communicating and implementing the decision (5) items.

Scoring system

Head nurses responses were measured on three point Likert Scale that ranged from (1) never, (2) sometimes, (3) always. The total score was ranged from 43-129 so that the higher scores indicate a high decision making abilities and vice versa. Decision making abilities level classified as high if total score was equal to 75% or more (97-129) and moderate if total score was equal to 60%- less than 75% (78-96), and low if total scores was less than 60% (77-43).

Pilot study

A pilot study was carried out in October, 2021. It was conducted on (11) head nurses who represent 10% of

total study subjects to ensure the clarity, feasibility, and objectivity of the content of the tools and to estimate the time needed to fill the questionnaires. Which were distributed to head nurses after explaining the purpose of the study. It took time ranged from 20 to 30 minutes. No modification was needed so the pilot study was included in the study subjects.

Field work

Data collection took about two months from beginning of November, 2021 till December, 2021. The subject was informed about the aim of the study, and the method of filling questionnaire. The researchers distributed the questionnaires to the participated subjects to fill it. Data was collected three days per week, on the morning shift in the presence of the researchers to clarify any ambiguity. The time needed to complete questionnaires was 20-30 minutes. Most questionnaires were distributed and collected on the same day while some of it was collected on the next day.

Validity

The study tools were presented to panel of jury for face and content validation. The jury included 5 experts from nursing administration. Modification was done based on jury comments such as modifying some words to give the right meaning for the phrase which did not understood clearly.

Ethical consideration

Before conducting the study, the participants were informed about the purpose and benefits of the study,

and they were informed that their participation is voluntary on that they have the right to withdraw from the study at any time without giving any reason. Informed consent was obtained from each participant of the study. In addition confidentiality and anonymity of the subjects were assured through coding of all data.

Administrative design

An official permission was obtained from the Dean of Faculty of Nursing, Benha University to the director of Benha University Hospital to conduct the study and seek their support.

Statistical design

Data were collected, tabulated, statistically analyzed using an IBM personal computer with statistical package of social science (SPSS) version 25 where the following statistics were applied

- Descriptive statistics: In which quantitative data were presented in the form of Mean, standard deviation (SD), frequency, and percentage distribution.
- Analytical statistics: used to find out possible association between studied factors. The used tests of significance for quantitative data and correlation coefficient was used to test "r"
- A significance level value was considered when p-value ≤ 0.05 and a highly significance level was considered when p-value ≤ 0.001 , while p-value >0.05 indicated non-significance results.

Results

Table (1): Distribution of studied head nurses regarding personal characteristics (n= 112).

Personal characteristics		No	%
Age	less than 35 years	12	10.7
	35-45years	46	41.1
	More than 45 years	54	48.2
	Mean \pm SD	37.803 \pm 7.969	
Gender	Male	22	19.6
	Female	90	80.4
Work unit	Medical	63	56.3
	Surgical	38	33.9
	Critical	11	9.8
Marital status	Married	90	80.4
	Unmarried	22	19.6
Nursing educational qualification	Technical diploma	30	26.8
	Technical associate diploma	8	7.1
	Bachelor degree	56	50.0
	Post-graduation studies	18	16.1
Years of experience	less than 10 years	21	18.8
	10-15 years	38	33.9
	More than 15 years	53	47.3
	Mean \pm SD	14.284 \pm 4.197	
Attending training courses in the field of decision making and problem solving	Yes	30	26.8
	No	82	73.2

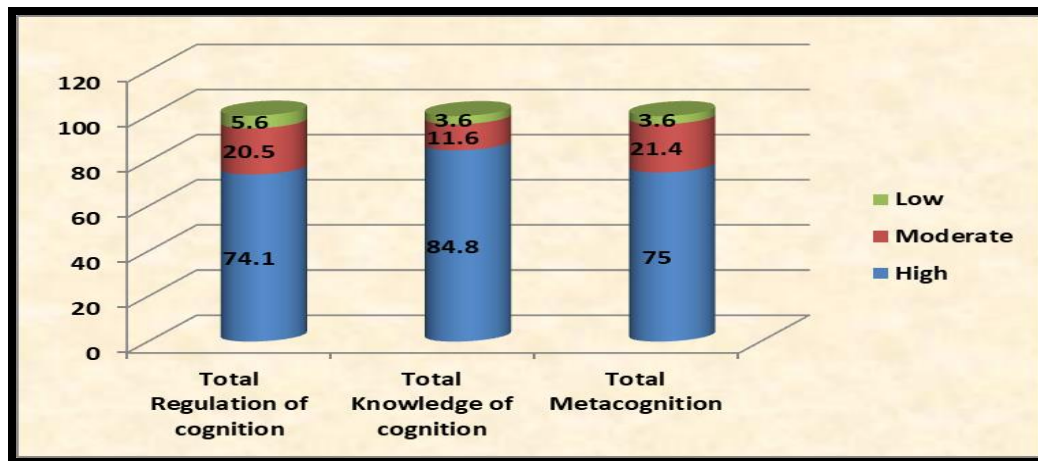


Figure (1): Total level of metacognition among head nurses. (n=112)

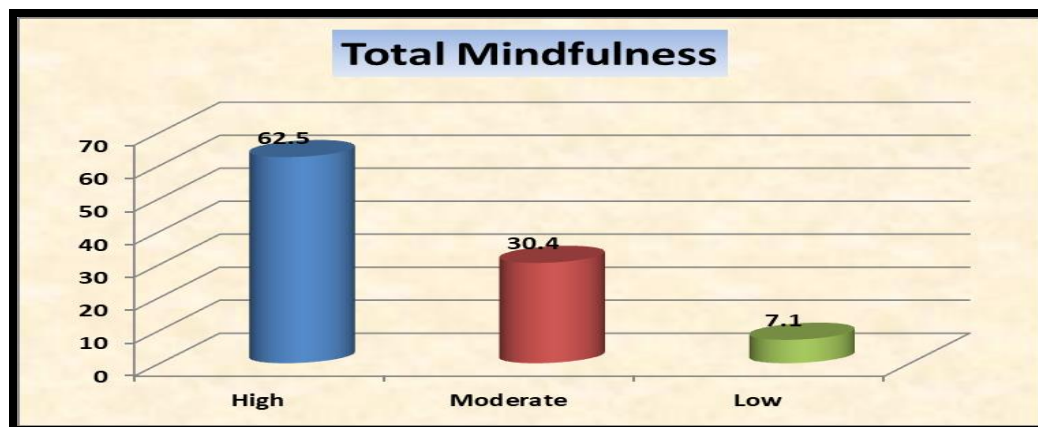


Figure (2): Total level of mindfulness among head nurses. (n=112)



Figure (3): Total level of decision making abilities among head nurses. (n=112)

Table (2): Correlation matrix between head nurses' total metacognition level, total decision making abilities level and total mindfulness level

Variables	Metacognition		Mindfulness	
	r	P- value	r	P- value
Decision making abilities	0.235	0.014*	0.567	0.000**

*Statistically significant at ($p \geq 0.05$)**highly statistically significant at ($p \geq 0.001$)

Table (1): Shows that less than half (48.2%) of head nurses were had more than 45 years with Mean \pm SD (37.803 \pm 7.969). As regards their gender and marital status, the highest percent (80.4%) of them were females and married. Regarding their nursing educational qualification, half (50.0%) of them were had bachelor degree. Concerning their units, more than half (56.3%) of them were working in medical units. As for their years of experience, less than half (47.3%) of them were had more than 15 years of experience with Mean \pm SD (14.284 \pm 4.197). While, more than one quarter (26.8%) of them were attend training courses in field of decision making and problem solving.

Figure (1): Shows that three quarters (75.0%) of head nurses had high level of metacognition. And less than quarter (21.4%) of them had moderate level of metacognition, while, only (3.6%) of them had low level of metacognition. And the highest percentage of them (84.8%, 74.1) had high level of knowledge of cognition, regulation of knowledge respectively.

Figure (2): Clarifies that less than two thirds (62.5%) of head nurses had high level of mindfulness. And less than one third (30.4%) of head nurses had moderate level of mindfulness. While, the minority of them (7.1) had low level of mindfulness.

Figure (3): Clarifies that the majority (84.3%) of head nurses had high level of decision making abilities. And only (15.7%) of head nurses had moderate level of decision making abilities.

Table (2): Indicates that there was statistically significant positive correlation between head nurses' total metacognition level and total decision making abilities ($r=0.235$, $p=0.014$). Also, there was highly statistically significant positive correlation between head nurses' total mindfulness level and total decision making abilities ($r=0.567$, $p=0.000$).

Discussion:

Metacognition is a process that is at the top of all executive cognitive processes and key psychological factor that involved in clinical decision making. Decision making is a complicated task performed by head nurses, as it involves wide range of cognitive processes that are utilized by head nurses to process large amount of information in order to make choices that allow achievement of goals with maximum quality and minimum cost. Because knowledge about circumstances of time and space is not given to head nurses in its totality, and outcomes of choices are not known in advance. Hence, decision making is almost associated with risk and uncertainty. (Karsli, 2015 & Najmaei, 2016).

Decision making is the backbone of administrative functions and is a critical part of being an effective

head nurse. Metacognition and mindfulness are a very important skill through which head nurses monitor decision uncertainty and consequently adjust and revise the decision, even in situations in which external feedback is not immediately available. Head nurses who can accurately assess their knowledge base, monitor, regulate, evaluate, and implement changes to cognitive strategies are able to make right and effective decisions that meet their units targeted outcomes and contribute to health care organizational growth. (Qiu et al., 2018).

Therefore the present study was conducted to assess relation between metacognition, mindfulness and decision making abilities among head nurses.

The findings of the present study illustrated that three quarters of studied head nurses had high level of metacognition. From researchers point of view this finding may be due to that the majority of head nurses were always know what kind of information is most important in making decision and have control over how well they make decision; they have specific purpose for each used strategy, aware of what strategies should use, when make decision and try to use strategies that have worked in the past. Also, this finding may be due to that the continuous generation of new knowledge is so critical for the improvement and innovation in nursing practice; so head nurses should have certain skills for critical thinking, problem solving and decision making. Subsequently, head nurses who use their metacognitive skills effectively and are aware of what, how and when to use knowledge could struggle to overcome problems and make decisions that improve nursing practice.

This finding was supported with Al-Hamouri & Abu Mokh, (2011) who examined "The level of metacognitive thinking among Yarmouk University students, in Yemen", Hochberg, (2014) who studied "Metacognition and decision making style in clinical narratives" and Cho, (2015) who examined "The relationships between managerial metacognition, total quality management, and firms sustainable competitive advantages: An empirical investigation based on structural equation modeling analysis", reported that the studied participants had a high level of metacognition.

Also, this finding was matched with Oguz & Ataseven, (2016), who examined "Metacognitive skills and motivation among university students, in Turkey" and Ata & Abdelwahid, (2019) who studied "Nursing students' metacognitive thinking and goal orientation as predictors of academic motivation" and Kourtidis, (2019) who studied "The effect of metacognition instruction on student performance". They reported that the studied participants had a high level of metacognition.

In contrast with the current study finding, studies carried out by **Amizil; Sting-Morrow, (2013), Aljaberi; Gheith, (2015); Wokke, Cleeremans & Ridderinkhof., (2017)**. They reported that the majority of the study subjects had a moderate level of metacognition. Where the first studied "Metacognition: Components and relation to academic achievement in college", and the second examined "University students' level of metacognitive thinking and their ability to solve problems", while the third studied "Metacognitive monitoring of decision making".

As regard knowledge of cognition domain, the current study finding showed that the majority of head nurses had high level of knowledge of cognition. This finding may be attributed to that, the highest percent of studied head nurses were always know what kind of information is most important in making decision; learn more when head nurses are interested in the topic; understand their intellectual strengths and weakness and become good judge of how well they understand something.

Moreover, more than two thirds of studied head nurses were always have specific purpose for each strategy they use; learn best when they know something about the topic; use different decision making strategies depending on situation; use their intellectual strengths to compensate for their weakness and know when each strategy they used will be most effective.

The previous study finding was supported with **Aljaberi; Gheith, (2015) & Oguz; Ataseven, (2016)** who reported that the majority of study subjects had high level of knowledge of cognition. Likewise, **Scharff et al., (2017)** who studied "Exploring metacognition as support for learning transfer among undergraduate nursing students and instructors" and reported that the majority of subjects had high level of knowledge of cognition.

However, this finding was dissimilar with **Yost, (2015)** and **Barazilai & Zohar, (2016)** who reported that the majority of study subjects had moderate level of knowledge of cognition. Where the first examined "The relationship of metacognition to perceived clinical decision making by registered nurses" and the second studied "Epistemic (meta) cognition: Ways of thinking about knowledge and knowing".

Regarding regulation of cognition domain, the study finding showed that the majority of head nurses had high level of regulation of cognition. This finding could be due to that, the highest percent of head nurses were always organize their time to best accomplish their goals; pace themselves enough time during making decision; consciously focus attention on important information; consider several alternatives to a problem before they answer; ask

themselves periodically if head nurses are meeting their goals; re-evaluate their assumptions when get confused and ask themselves how well accomplish their goals once they finished.

This study finding was matched with previous study carried out by **Chiejina & Ebenebe, (2013)** who studied "Metacognitive strategies adopted by nursing students", **Yost, (2015) & Abdelwahid, (2019)**. They reported that the majority of subjects had high level of regulation of cognition. In contrast with study finding, study carried out by **Karsli, (2015)** who studied "Relation among metacognition level, decision making, problem solving and locus of control in a Turkish adolescent population" and **Scharff et al., (2018)**, reported that the majority of study participants had moderate level of regulation of cognition.

Regarding to head nurses' level of mindfulness, the findings of the current study revealed that less than two thirds of head nurses had a high level of mindfulness. From researchers this may be due to having mindfulness of the present can improve the reliability of a process's performance and focusing attention is crucial for functioning efficiently. The main idea behind being a mindful head nurse is to have more acceptance and attention concentrating when completing daily activities. The result of the current study is consistent with **Mostafa, EL-Sayed, (2021)** stated that more than half had high mindfulness level, and with **Penque, (2019)**, who study mindfulness to promote nurses' well-being, also **Choi & Koh, (2015)**, reported that study subjects had high level of positive disposition toward mindfulness with highest percentage of mindfulness characteristics related to acceptance. While the previous findings was disagreed with **Elmawla, Shabaan, Abo Ramdan, (2020)** who stated that more than half of head nurses had moderate level of mindfulness in pre educational program assessment, also, was in inconsistent with **Gunther, (2014)**, who stated that head nurses level of mindfulness more aware to each situation they face rather than focusing acceptance on just reaching their goal.

The current study finding showed that, the majority of head nurses had high level of decision making abilities. This finding could be due to that, the quality of decisions that head nurses made is the yardstick of their effectiveness; hence head nurses should have the abilities that enable them to make sound and effective decisions. The majority of head nurses were always can identify the problem well and can determine the requirements and establish goals to solve the problem.

Also, the highest percent of them were always conduct enough search for alternatives, if the clinical decision is vital and there is a time; list options

before making a decision and use brainstorming method when thinking of ideas and options. In addition, evaluate the alternatives according to ethical and economic standards and consider even the remotest consequences before making a decision; take a lot of care before choosing; if the risks of an alternative are serious enough to cause problems, reject the option; review the negatives and the positives of the decision; head nurses can convince others about their decisions and rarely impose their decisions on others.

This finding was similar with **Shaaban, Zahran & Mohamed., (2014)** who studied "Decision making performance process among head nurses", **Puseljic, Skledar & Pokupec., (2015)** who studies "Decision making as a management function among managers", **Olague, (2017)** who studied "The decision making abilities of bilinguals and monolinguals facing an adaptability scenario" and **Abd El Ghaffar, (2018)**, reported that the majority of study participants had high level of decision making abilities.

However, this finding disagree with **Yost, (2015)** who reported that the majority of subjects had moderate to high level of decision making ability. Likewise, **McGarry; li, (2016) & kartoshkina, (2016)** who reported that the highest percent of study participants had moderate level of decision making ability. Where the first studied "The effect of individual decision making abilities on long term care insurance purchase", and the second studied "exploring decision making and metacognition of faculty teaching abroad".

The current study indicated that there was statistically significant positive correlation between head nurses' total metacognition level and total decision making abilities level. This means that head nurses who have high level of metacognition would have high level of decision making abilities. And head nurses who have low level of metacognition would have low level of decision making abilities.

This finding may be attributed to that, head nurses who can accurately assess their knowledge base, monitor, regulate and implement changes to cognitive strategies are able to make right and effective decisions. Also, metacognition is very important skill through which head nurses monitor decision uncertainty and consequently adjust and revise the decision, even in situations in which external feedback is not immediately available. In addition, metacognition allows head nurses to monitor and regulate their own thinking, to be aware of their knowledge and maximize their abilities to think, learn and evaluate, which help them spend less time on making decision.

In similarity with this finding, the study finding of **Strle, (2012)** who studied "Metacognition and

decision making: Between first and third perspective" and concluded that metacognitive capabilities and metacognitive knowledge influence decision making ability. Also, this study finding was in agreement with **Yost, (2015)** who demonstrated that registered nurses with higher levels of metacognition have higher level of their clinical decision making ability. In addition, the study result was in the same line with **Boldt & Annika, (2015)** who studied "Metacognition in decision making" and suggested that metacognition is crucially involved in decision making and cognitive control.

Additionally, this finding supported by **Karsli, (2015)** who reported that metacognitive developmental level as measured by metacognitive awareness inventory (MAI) is a prominent indicator of decision making and problem solving performances of adolescents. Likewise, **Turner-Walker, (2016)** who studied "The application of metacognition to business decision making among students at Victoria University" and found that teaching students about the concept of metacognition along with developing skills in the application of metacognitive strategies have the potential to enhance decision making capacity, which in turn will address the complexity..

Moreover, this finding was in agreement with **Medina, Castleberry & Persky, (2017)** who studied "Strategies for improving learner metacognition in health professional education" and reported that metacognition's role in clinical decision making is important as it is a means to address what to learn, when to learn, and how to learn. And **Wokke, Cleeremans & Ridderinkhof, (2017)** who reported that metacognition is a crucial aspect of adaptive decision making. Likewise, **Maraglia et al., (2018)** who study "Metacognition as an educational technology in self-care learning: The case of prevention of post-surgical lymphedema of breast cancer" and reported that using metacognitive approach by nursing staff in teaching self-care, result in empowering women, specifically enable clients to make decisions and making the process more conscious and autonomous.

The findings of the current study revealed that there was statistically positive correlation between head nurses mindfulness and their decision making abilities. The findings of the current study was supported with **Arendt et al., (2019)**, reported that there was positive and significant relationship between studied sample mindfulness, leadership effectiveness, communication skills and decision making abilities.

Conclusion:

The present study concluded that three quarters of head nurses had high level of metacognition, less than two thirds of them had high level of mindfulness. And majority of them had high level of decision making abilities. And metacognition and mindfulness was positively statistically significant correlate with decision making abilities among head nurses.

Recommendations:

According to the findings of the present study, it is recommended that:

For hospital administration:

- Encouraging head nurses to use and apply strategies that enhance metacognition such as planning, monitoring, reviewing after a task, asking questions, self- reflection, thinking out loud and making sure to get feedback.
- Hospital management need to support head nurses when deciding and provide the resources required to implement the decision.
- Encourage periodic staff meeting by head nurses to allow them express their feeling, seeking opinion, exchange their experiences during different situation and getting feedback and support.
- Head nurses have to be represented in hospital committees, sharing and participating in decision making about patients' problems and hospital policies.

For education:

- Involve metacognition into nursing curriculum and focus on its importance in different aspect of nursing profession.
- Conducting continues training programs for head nurses about metacognitive skills and decision making skills.

For further research :

- Conduct research to examine metacognition and clinical decision making among staff nurses and student nurses.
- Examine metacognition and nursing care process among staff nurses and student nurses.
- Study the relation between metacognition, self-directed learning and academic achievement among nursing students.
- Conduct research to study factors affecting nurses' awareness regarding metacognition.
- Conduct research to measure the extent of staff nurses involvement in decision making.
- Conduct research to study challenges facing nurses' involvement in decision making process.

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