Relationship between Locus of Control, Metacognitive Awareness and Academic Performance among Alexandria faculty of Nursing Students.

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Abstract

Background *Locus of control and metacognition awareness play important roles in improving students' performance and academic achievement, as well as increasing the quality of care.* ***Objective:*** *To identify the relationship between locus of control, metacognitive awareness, and academic performance among Alexandria faculty of Nursing Students.* ***Setting:*** *The study was conducted in all nine scientific nursing departments. at the Faculty of Nursing, Alexandria University.* ***Subjects:*** *The participants of this study consisted of 400 nursing students. These students were selected through a random and representative sampling method.* ***Tools:*** *Three tools were used. Academic Locus of Control Scale & Metacognitive Awareness Inventory Scale & Students' Academic Performance Questionnaire.* ***Results:*** *The study showed that the majority of the students (83.25%) had a high internal locus of control, while only 2.5% had a high external locus of control. Moreover, nearly three-quarters (70.25%) of the students had a high level of metacognitive awareness, while slightly less than one-third (29.75%) of them had an average metacognitive awareness level. Additionally, slightly less than half (47.5%) of the students had a good academic performance. a positive, significant correlation was found between the students' academic locus of control and the dimensions of metacognitive awareness (p < 0.001*) and the overall metacognitive awareness (p < 0.001*). Also, a positive, significant correlation was found between the students' academic locus of control and their academic performance (p < 0.001*).* ***Conclusion****: Based on the findings of the present study, it can be concluded that the majority of nursing students had a high level of internal locus of control and metacognitive awareness; additionally, a substantial proportion of them had excellent and good academic performance. Also, a strong relationship was found between locus of control, metacognitive awareness, and academic performance among faculty of nursing students.* ***Recommendations:*** *The educator should assist the students in developing an internal locus of control to improve their academic performance and minimize the level of failure in examinations. Also, the educator should be trained to pose classroom questions to increase students' metacognitive awareness and achievement.*

Keywords: Locus of Control, Metacognitive Awareness, Academic Performance, Faculty of Nursing Students.

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Introduction

Nursing education represents a foundational discipline aimed primarily at the attainment of favorable health outcomes for patients. Nursing care constitutes an essential element of the healthcare delivery framework. Furthermore, nurses are integral members of the healthcare team, assuming a crucial role in the provision of exemplary care. Consequently, it is imperative to equip nurses with the requisite knowledge, skills, and dispositions necessary for them to emerge as highly competent professionals. Inadequately prepared nurses may not only impede the overall effectiveness of the healthcare team but may also contribute to substandard healthcare delivery. Clinical education is central to nursing education and is instrumental in preparing students for their forthcoming professional roles as nurses; thus, enhancing and nurturing their academic performance is of paramount importance (Amidos & Simanjuntak, 2020).

Academic performance serves as a quantifiable indicator of students' accomplishments across a spectrum of academic disciplines. More specifically, it is characterized as the degree to which students have achieved the anticipated academic standards (Al Husaini, Ahmad Shukor, 2023). Educators typically assess academic achievement through various metrics, including classroom performance, graduation rates, and outcomes from standardized assessments. Numerous factors impact student academic performance, including prior semester grades, performance on class assessments, seminar contributions, assignment results, attendance in lectures and laboratory sessions, locus of control, and metacognitive awareness (Choudhury & Borooah, 2017).

The construct of locus of control is rooted in social learning theory. According to this theoretical framework, individuals' behaviors are influenced by their interactions with their environment, encompassing elements derived from their upbringing and the societal expectations they encounter (Firmansyah & Saepuloh, 2022). One of the initial advocates of this notion was Julian Rotter, who conceptualized locus of control as the perception of personal agency over the sources of reinforcement within one's life. Locus of control can be articulated as the extent to which individuals believe they possess the capacity to influence the outcomes of their actions. Moreover, it represents a personality characteristic that emphasizes cognitive capacities that predict the anticipated results of events in an individual's life (Steca, 2021).

Two distinct categories of locus of control exist: internal and external locus of control. An internal locus of control denotes a robust sense of personal agency, shaped by internal determinants, whereas an external locus of control signifies a diminished sense of personal agency, influenced by external determinants (Wahyeni & Gailea, 2022). Individuals exhibiting an internal locus of control maintain a strong conviction in their capabilities and believe that the feedback they receive from their environment is a direct result of their attitudes. Additionally, they exhibit high motivation for achievement and possess a low degree of external orientation (Chinedu & Nwizuzu, 2021). Conversely, individuals with an external locus of control attribute their successes or failures to external factors unrelated to their own actions, which may include the simplicity of examinations and various environmental influences (Morelli et al., 2023).

Strong metacognitive competencies are positively correlated with learning outcomes and student performance. They play a crucial role in a student-centered pedagogical approach, whereby students are empowered to oversee their self-directed learning. Furthermore, it is imperative to foster students' enhancement of critical thinking abilities and to advocate for proficient problem-solving competencies by discerning misconceptions and deficiencies

in their knowledge base (Karatas, 2017). Moreover, through the utilization of metacognitive skills, learners are allowed to reinforce their learning processes, which consequently enhances the retention of information (Zhang & Zhang, 2019).

An array of empirical studies has indicated a favorable correlation between metacognitive awareness and academic achievement (Abdelrahman, 2020). Samuel and Okonkwo (2021) ascertained that students exhibiting elevated metacognitive knowledge achieved superior results on assessments in comparison to their counterparts possessing a diminished level of metacognitive knowledge. Additionally, Özçakmak et al. (2021) identified a positive correlation between students' metacognitive awareness and their cumulative grade-point average. This correlation between metacognitive awareness and academic success appears to maintain consistency across a diverse range of academic disciplines.

Nursing education continuously endeavors to produce highly proficient nursing graduates capable of addressing various patient conditions. The constructs of locus of control and metacognitive awareness significantly contribute to the enhancement of students' performance and the augmentation of their academic accomplishments while concurrently improving the quality of patient care. Throughout the educational process, it is of paramount importance to cultivate both internal and external locus of control to enrich students' metacognitive reserves; this enrichment subsequently influences their academic achievements and professional competencies. Consequently, it is essential to investigate the interplay between locus of control, metacognitive awareness, and academic performance among nursing students (Education Endowment Foundation (EEF), 2018).

Significance of the Study

This study holds significant academic and practical implications by elucidating the complex relationship between locus of control, metacognitive awareness, and academic performance among nursing students at Alexandria University. Given the critical role of self-regulation and cognitive control in higher education, particularly in disciplines requiring critical thinking and autonomous decision-making, understanding these psychological constructs is essential for optimizing student learning outcomes. By establishing empirical links between these variables, the study provides a foundation for evidence-based pedagogical interventions aimed at fostering an internal locus of control and enhancing metacognitive awareness, thereby promoting self-directed learning and academic excellence. Furthermore, since nursing education directly influences healthcare quality, improving students' cognitive and academic competencies has broader implications for patient care and clinical decision-making. The findings may inform curriculum development, instructional strategies, and student support initiatives, contributing to a more resilient, reflective, and academically proficient nursing workforce, ultimately advancing the standards of healthcare education and practice.

Aim of the Study

The purpose of this study is to identify the relationship between locus of control, metacognitive awareness, and academic performance among Alexandria faculty of Nursing Students.

Research questions:

- What is the extent of locus of control among Alexandria faculty of nursing students?
- What is the level of metacognitive awareness among Alexandria faculty of nursing students?

Locus of Control, Metacognitive Awareness, Academic Performance, Nursing Students.

- What is the level of academic performance among Alexandria faculty of nursing students?

- What is the relationship between locus of control, metacognition awareness, and academic performance among Alexandria faculty of nursing students?

Materials and Method

Materials
Design: A descriptive correlational research design was utilized in this study.

Setting: This study was conducted at all nine scientific nursing departments namely: Nursing Education, Critical Care and Emergency Nursing, Nursing Administration, Psychiatric and Mental Health Nursing, Pediatric Nursing, Medical and Surgical Nursing, Obstetrics and Gynecological Nursing, Gerontological Nursing, Community Health Nursing departments, at the Faculty of Nursing, Alexandria University.

Subjects:

The participants of this study consisted of 400 nursing students. These students were selected through a random and representative sampling method to accurately reflect the entire population of nursing students (N = 3826) enrolled across the four academic levels during the academic year 2023-2024. The determination of the sample size was executed utilizing the Epidemiological Information 7 software (Epi Info 7 software) based on the following parameters: Population size: 3826 (total number of nursing students) for the academic year 2023-2024. Confidence level: 95%. The margin of error: is 5% with an expected frequency of 50%. Minimum sample size necessary: 349. The final sample size was: 400. According to the Epi Info program, the calculated sample size was established to be 400 students. The overall sample size was distributed via the proportional allocation technique by multiplying the population size of each category by the total sample size, followed by dividing the resultant figure by the overall population size.

Tools: three tools were used to collect the necessary data:

Tool I: Academic Locus of Control Scale:

This scale was initially formulated by Ashton Trice (1985) to evaluate the academic locus of control within university populations and was subsequently revised by Nicholas Curtis and Ashton Trice (2013). The researcher has adopted this scale to gauge nursing students' orientation toward internal or external locus of control. The scale comprises 28 items, including statements such as, "I have defined my own career goals," "I feel motivated toward succeeding in life," "I plan effectively," and "I adhere to my plans." The scale employs a five-point Likert format, ranging from strongly agree (5) to strongly disagree (1). A reliability assessment of this scale was conducted by Nicholas Curtis (2013), yielding a coefficient value of 0.70. The scoring system of this scale was ranged from 28 to 140 and distributed as follows: A very strong external locus of control 28 < 50. External locus of control 50 - < 72. External and internal locus of control 72 - < 94. Internal locus of control 94 - < 116. Very strong internal locus of control 116 - < 140.

Tool II: Metacognitive Awareness Inventory Scale
This scale was originally conceptualized by Schraw and Dennison (1994) and later adapted by Arslan and Akin (2014) to evaluate students' metacognitive awareness. The researcher has utilized this scale in the current study to assess the level of metacognitive awareness among nursing students. Comprising 52 items, it is categorized into two dimensions: knowledge of cognition and regulation of cognition. The knowledge of cognition dimension includes seventeen items, such as, "I am aware of what strategies I utilize when I study," while the regulation of cognition dimension encompasses thirty-five items, including, "I pose questions to

myself regarding how well I am performing while acquiring new knowledge." The scale items were measured on a five-point Likert scale ranging from strongly agree (5) to strongly disagree (1). A reliability test of this scale was done by Arslan and Akin (2014) through test retests over three weeks, and the result was 0.95. The scoring system of this tool ranged from 52 to 260 and was distributed as follows: Very low metacognitive awareness 52 < 94. Low metacognitive awareness 94-<136.Average metacognitive awareness: 136 - < 178.High metacognitive awareness: 178 - < 220.Very high metacognitive awareness: 220-260.

Tool III: Students' Academic Performance Questionnaire:

This questionnaire was originally developed by McGregory (2015) and subsequently adopted by the researcher to evaluate the academic performance of nursing students. It consists of eight items and is measured using a five-point Likert scale, ranging from strongly agree (5) to strongly disagree (1). A reliability assessment of this scale was conducted by McGregory (2015), resulting in a coefficient of 0.89. The scoring system of the questionnaire ranged from 8 to 40 and was distributed as follows: A score of 8 indicates failing academic performance. Scores from 9 to 16 indicate poor academic performance. A score from 17 to 24 indicates moderate academic performance. Scores from 25 to 32 indicate good academic performance. Scores from 33 to 40 indicate excellent academic performance.

Attached to the previously mentioned tools, a sheet contains personal and academic data about nursing students, such as age, sex, marital status, working condition, number of working hours per week, and CGPA.

Method

The research was accomplished according to the next steps:

Approval from the Research Ethics Committee was secured from the Faculty of Nursing, Alexandria University, before the commencement of this study. An official consent to conduct the study was acquired from both the Dean and the Vice Dean of Students' Affairs of the Faculty of Nursing at Alexandria University before the initiation of the research. Additionally, formal permission to conduct the study was granted by the heads of all nursing departments within the Faculty of Nursing, Alexandria University, after a comprehensive elucidation of the study's objectives. The instruments utilized were adapted, translated, and subjected to back-translation into the Arabic language by the researcher.

The instruments were evaluated for content validity by five experts in the pertinent fields (psychiatric and mental health nursing and nursing education), and requisite modifications were implemented accordingly. A pilot study was conducted involving 40 nursing students to assess the clarity, feasibility, and practicality of the instruments. Consequently, essential alterations were made. The nursing students who participated in the pilot study were excluded from the total study population. The reliability of the instruments was assessed utilizing Cronbach's Alpha, yielding a coefficient of 0.70 for Tool I, 0.95 for Tool II, and 0.89 for Tool III.

Data collection transpired at the Faculty of Nursing, Alexandria University, encompassing the four academic levels during the second semester of the academic year 2023-2024. Data was amassed over a span of three months, commencing from the onset of April 2024 until the conclusion of June 2024. Initially, the researcher introduced himself and clarified the study's purpose to the students. The questionnaires were disseminated to students following the conclusion of their theoretical lectures and

after their clinical days, with the researcher present to provide additional clarification.

Instruments were hand-delivered to each student who consented to participate in the study. They were requested to complete the instruments and return them to the researcher. All nursing students received identical instructions from the researcher regarding the completion of the questionnaires. They were also instructed to provide only one response per item and not to leave any questions unanswered. The questionnaire was completed in approximately 20 minutes.

Statistical analysis:

The collected data were categorized, coded, digitized, and computed using the Statistical Package for Social Sciences (SPSS) version 23 software, and then they were examined. The categorical variables of both groups were described and summarized using statistical techniques like cross tabulation. Analytical and descriptive statistics, including percentages, mean, and SD, were used, while the Chi-square and Fisher Exact tests were employed to identify differences in the results at a significance level of less than 0.05 (5%).

Ethical Considerations:

Written informed consent was secured from all participants following a comprehensive elucidation of the study's objectives. The confidentiality of the data and the privacy of the students were rigorously guaranteed. Participants retained the prerogative to withdraw from the study at any juncture. Participation was entirely voluntary in nature. The anonymity of all subjects involved in the study was meticulously preserved.

Results

Table (1) shows the distribution of the nursing students according to their personal and academic data. It can be seen that the age of nearly two-thirds of nursing students (62.5%) ranged from 20 to less than 22 years old. More than half of the students (56.25%) were male, and the majority of them were single. Moreover, the descending percentile distribution of students according to their academic semester was 35%, 26.5%, 23.5%, and 15% for the first, second, third, and fourth academic levels, respectively. Furthermore, the last GPA of three-quarters of them (75.75%) fluctuated from B+ to B-. About half of the students (51.75%) worked during their academic study, and nearly one-third (34.3%) of them reported that they worked from 35 to 40 hours per week.

Table 2 depicts the distribution of nursing students according to their overall academic Locus of Control level. This table shows that the majority of the students (83.25%) had a high level of internal locus of control, while only 2.5% of them had a high level of external locus of control with the total mean percent score (64.4±7.7).

Table 3 shows the distribution of the students according to their overall metacognitive awareness level. This table revealed that nearly three-quarters (70.25%) of the students had a high level of metacognitive awareness, while slightly less than one-third (29.75%) of them had an average metacognitive awareness level with the total mean percent score (64.1±10.7).

Table 4 portrays the distribution of nursing students according to their academic performance levels. It was noticed that 58% and 42.8% of students agreed that they start papers and projects as soon as they are assigned and enjoy homework and activities to improve their skills in every subject, respectively. More than one-third (39.75%) of students agreed that they want to get good grades in every subject, while 39.25% of them disagreed that solving problems is a useful hobby for them. Furthermore, about two-fifths of the students neutrally participate in every discussion actively and pay attention and listen during every discussion (42.5% and 38.75%, respectively). Generally, this table shows that slightly less than half (47.5%) of

the students had a good academic performance, with the mean percent score being 64.4±14.1.

Table 5 shows the relationship between students' personal and academic data and their academic locus of control, metacognitive awareness, and academic performance. It was noticed that there was a statistically significant relationship between the students' age and their metacognitive awareness and academic performance (p = 0.001* & p = 0.043*, respectively). There was only a statistically significant relationship between students' gender and their academic performance (p < 0.001*). Regarding marital status, there was a statistically significant relationship between the students' marital status and their locus of control and academic performance (p = 0.001* & p = 0.012*, respectively). Moreover, it was revealed that there was a statistically significant relationship between the students' last GPA and their locus of control, metacognitive awareness, and academic performance (p < 0.001*, p = 0.001*, & p < 0.001*, respectively).

As regards the students' working conditions, it was observed that there was a statistically significant relationship between the students' working conditions, their locus of control, and their academic performance (p = 0.003* & p < 0.001*, respectively). Moreover, there was a statistically significant relationship between the students' working hours and their locus of control, metacognitive awareness, and academic performance (p < 0.001*, p < 0.001*, & p < 0.001*, respectively). Finally, a statistically significant relationship was presented between the students' academic level and their locus of control, metacognitive awareness, and academic performance (p < 0.001*, p = 0.002* & p < 0.001*), respectively.

Table 6 exhibits a correlation between the students' academic locus of control and their metacognitive awareness. It was observed that a positive, significant correlation was found between the students'

academic locus of control and the dimensions of metacognitive awareness (p < 0.001*) and the overall metacognitive awareness (p < 0.001*). That is to say, with an increasing score of academic locus of control, the level of metacognitive awareness also increases, and vice versa.

Table 7 exhibits a correlation between the students' academic locus of control and their academic performance. It was observed that a positive, significant correlation was found between the students' academic locus of control and their academic performance (p < 0.001*). That is to say, with an increasing score of academic locus of control, the level of their academic performance also increases, and vice versa.

Table 8 reveals a correlation matrix between the students' academic locus of control and their metacognitive awareness and academic performance. A significant, strong positive correlation was found between the students' academic locus of control and their metacognitive awareness (p < 0.001*). Moreover, a significant, strong positive correlation was observed between the students' academic locus of control and their academic performance (p < 0.001*). It can be deduced that there was a strong positive correlation between students' metacognitive awareness and their academic performance (p < 0.001*).

Discussion

The relationship between locus of control, metacognitive awareness, and academic performance highlights the intricate interplay of psychological and cognitive elements pertinent to nursing students. By cultivating an internal locus of control and augmenting metacognitive awareness, educators can profoundly influence students' academic achievement and professional readiness. Furthermore,

educational interventions that advocate for these dimensions may facilitate enhanced learning outcomes for students (Al Husaini, Ahmad Shukor, 2023). Consequently, this study endeavored to examine the relationship between locus of control, metacognitive awareness, and academic performance among students enrolled in the Alexandria Faculty of Nursing. The ensuing discussion of the study's findings will be organized under four principal headings: students' locus of control, students' metacognitive awareness, students' academic performance, the correlation between nursing students' academic locus of control and academic performance, and the correlation between metacognitive awareness and academic performance.

The findings of the current study indicated that a substantial majority of the students exhibited a high level of internal locus of control and metacognitive awareness, with nearly half demonstrating commendable academic performance. At first glance, this outcome appears to be quite satisfactory. However, such a cursory evaluation necessitates further verification. The subsequent discussion of the findings will elucidate this matter. Concerning the socio-demographic characteristics of the study subjects, the results indicated that all students exhibited similarities across nearly all facets of their professional attributes. This homogeneity is advantageous in mitigating confounding variables that could potentially disrupt the relationship between locus of control, metacognitive awareness, and academic performance among nursing students.

In the evaluation of nursing students' academic locus of control, the findings of the present study disclosed that a predominant number of nursing students possessed a high level of internal locus of control. This observation may be attributed to the tendency of students who hold the belief that their diligence will yield superior grades to be more inclined to invest

considerable time and effort into their academic pursuits. Such a belief fosters resilience, thereby motivating them to surmount challenges rather than attributing setbacks to external factors. The current findings are congruent with those of prior studies in several respects. A study conducted by Mohamed et al. (2018) titled **"Relation Between Locus of Control and Academic Achievement of Nursing Students at Damanhur University"** revealed that over two-thirds of the nursing students exhibited a high level of internal locus of control.

A study conducted by Mohamed et al. (2023) entitled **"Academic Support, Locus of Control, and Achievement among Postgraduate Nursing Students"** indicated that the majority of postgraduate nursing students reported a heightened perception of academic support alongside an internal academic locus of control. **Mutawalli** 2020, conducted a study entitled **"Academic Self-Efficacy as A Predictor of Academic Locus Of Control Among Secondary School Students In Kenya,"** The results revealed that the majority of the students had a high level of internal locus of control. **Baji & Barkuta** (2024). They conducted a study entitled **"Difference in gender locus of control and academic performance of senior secondary students in the Minna educational zone, Nigeria Baji."** They found that almost all of the students had a high level of internal locus of control.

In the assessment of **metacognitive awareness among nursing students**, the findings of the current investigation demonstrated that nearly seventy-five percent of nursing students exhibited a pronounced level of metacognitive awareness. This outcome can be ascribed to the notion that metacognitive awareness encompasses self-regulation coupled with the capacity for reflective analysis of one's learning methodologies. Such self-awareness empowers students to critically appraise their comprehension and the efficacy of their learning strategies, which

consequently facilitates enhanced academic performance. The present results are congruent with the conclusions drawn from four additional studies. Baguin & Janiola (2024) executed an inquiry entitled **"Students' Level of Metacognitive Awareness as Correlates of their Mathematics Achievement."** The findings elucidated that students displayed elevated levels of both metacognitive knowledge and metacognitive regulation awareness. Radmehr and Drake (2020) explored **"Exploring students' metacognitive knowledge: The case of integral calculus."** The results revealed that all participating students possessed a high degree of metacognitive knowledge and regulation.

A study conducted **by Ramadhanti et al. (2021).** They investigated **"Students' metacognitive awareness and its impact on writing skill.** Their results revealed that the vast majority of the students had a high level of metacognitive awareness. Additionally, metacognitive awareness has an important role in writing skills**. Fourthly,** a study conducted by **Nguyen et al.** (2023). Titled "Relationship Between Metacognitive Awareness of Undergraduate Students and Students' Academic Performance at Vietnam Military Medical University". The study showed that medical students at the Vietnamese Military Medical University were likely to have a high metacognitive awareness score. High metacognitive awareness scores might predict higher students' academic performance.

On the other hand, the current finding is relatively incongruent with a study conducted by **Krisdianata et al.** (2022), Investigating **"EFL High School Students Metacognitive Awareness in Writing"**. The findings indicated that high school learners displayed low metacognitive awareness and regulation when writing descriptive texts.

The current investigation's findings assessed nursing students' academic performance. It demonstrated that approximately two-thirds of nursing students exhibited commendable and superior academic achievements. This observation may be ascribed to various factors, including the existence of a nurturing academic atmosphere, the provision of effective pedagogical methodologies, and a dedication to fostering student success.

The current findings are congruent with the other two studies. **Prince et al.** (2023). They assessed **"Study Habits and Academic Performance of the Nursing Students."** A study conducted among final-year nursing students revealed that about two-thirds achieved first-class academic performance, and the majority of them had good study habits. This suggests a strong link between effective study practices and academic success. A study conducted by Radwan et al. (2023). Titled **"Association between Metacognitive Awareness of Pediatric Nursing Students and Their Academic Achievement: A Correlational Study"**. Their results revealed that the mean total score of total achievement level was high, 19.84 ± 4.03, among nursing students.

In assessing the correlation between nursing students' academic locus of control and academic performance

The results of the present study indicated that a significant, strong, positive correlation was found between the students' locus of control and their academic performance ($p < 0.001*$). This result may be attributed to the students who believe they have control over their academic outcomes tending to perform better academically.

The current findings are congruent with **Alkorashy and Alotaibi (2023). They investigated "Locus of Control and Self-Directed Learning Readiness of Nursing Students during the COVID-19 Pandemic: A Cross-Sectional Study from Saudi Arabia." The study's results** showed a significant positive correlation

between an internal locus of control and readiness for self-directed learning. Nursing students with an internal locus are more likely to take responsibility for their learning, while those with an external locus often exhibit lower readiness for self-directed learning.

In the analysis of the correlation between nursing students' metacognitive awareness and academic performance, the findings of the current investigation revealed a significant and robust positive correlation between students' metacognitive awareness and their academic performance ($p < 0.001*$). This outcome can be ascribed to the premise that metacognitive awareness equips students with the ability to discern their academic strengths and weaknesses. Such insight allows learners to concentrate on areas that need enhancement, thereby ultimately improving their academic results.

The current findings align with a study conducted by **Ata and Abdelwahi (2019),** entitled "Nursing Students' **Metacognitive Thinking and Goal Orientation as Predictors of Academic Motivation**." Their results showed that metacognitive thinking was positively correlated with both goal orientation and academic motivation, suggesting that students who are more aware of their learning strategies tend to perform better academically.

On the other hand, the current finding is relatively inconsistent with a study conducted by **Hassan et al**. (2023). They conducted a study entitled "**Metacognitive awareness and its relation to students' academic achievement: time to ponder its implication in delivery of curriculum".** Their results revealed that regarding the correlation between metacognitive awareness and academic performance, there is a negative association between knowledge of cognition and academic achievement among the students. They attributed their results to students not being able to accurately assess their cognitive

abilities, leading to unrealistic self-evaluations of their learning processes. Such misjudgments can negatively impact their academic performance.

Conclusion
Based on the findings of the present study, it can be concluded that the majority of nursing students had a high level of internal locus of control and metacognitive awareness; additionally, a substantial proportion of them had excellent and good academic performance. Also, a strong relationship was found between locus of control, metacognitive awareness, and academic performance among faculty of nursing students.

Recommendations
Based on the obtained results from the present study, our recommendations are:
- **Conduct** ongoing assessments of student performance to identify trends and areas requiring intervention, ensuring that all students receive the necessary support to thrive.
- **Establish** supplementary academic support services, such as tutoring and mentoring programs, to assist students who may encounter difficulties.
- **Help** students cultivate an internal locus of control to enhance their academic performance and reduce the incidence of failure in examinations.
- **Develop** a cognitive coaching program designed to elevate the internal locus of control among nursing students.
- **Engage** higher-order cognitive abilities as outlined in Bloom's taxonomy and incorporate reflective thinking skills into teaching strategies.
- **Train** educators to formulate classroom inquiries that promote students' metacognitive awareness and academic achievement.

Locus of Control, Metacognitive Awareness, Academic Performance, Nursing Students.

Limitations of the Study

Despite the valuable findings of this study, several limitations should be acknowledged:

- **Sample Representation** – The study was conducted among nursing students from the Alexandria Faculty of Nursing, which may limit the generalizability of the findings to other nursing faculties or students from different academic disciplines and institutions.

- **Exclusion of External Factors** – The study did not account for other external factors that might influence academic performance, such as socioeconomic status, mental health, teaching methods, or institutional support systems. These unmeasured variables could impact the observed relationships.

Authors' contributions:

Elham Mohamed Abdelkader Fayad, Professor: Supervising research and thesis stages. Contributed to conceptualizing study designs and the final review of the thesis.

Marwa Mohamed Mahmoud Abdellah , Lecturer
Directing research and thesis stages. Contributed to conceptualizing study designs and the final review of the thesis.

Mohamed Saied Ali Heikal, a nursing specialist, collects and analyzes data, interprets findings, and draws meaningful conclusions. Additionally, the student collaborates with their supervisors for guidance as well as writing and presenting the thesis with clarity and academic rigor.

Table (1): Distribution of the nursing students according to their personal and academic data (n=400)

Personal and academic data	(N=400)	%
Age (years)		
▪ 18 - <20	97	24.25
▪ 20 - <22	250	62.5
▪ ≥22	53	13.25
Mean ± SD	20.3±1.04	
Gender		
▪ Male	225	56.25
▪ Female	175	43.75
Academic level		
▪ First	140	35
▪ Second	106	26.5
▪ Third	94	23.5
▪ Fourth	60	15
Marital status		
▪ Single	372	93.0
▪ Married	28	7.0
Last GPA		
▪ A-	78	19.5
▪ B+ to B-	303	75.75
▪ C+	19	4.75
Mean ± SD	3.1±0.33	
Working condition		
▪ Yes	207	51.75
▪ No	193	48.25
If. Yes: how many Hours/week (n = 207)		
▪ <20	52	25.1
▪ 20-<25	53	25.6
▪ 30- <35	10	4.8
▪ 35-<40	71	34.3
▪ >40	21	10.1

Mean ± SD	29.3±9.6

Table (2): Distribution of the nursing students according to their overall academic locus of control level (n=400)

Level of academic locus of control	No. (400)	%
Very strong external locus of control	0	0.0
External locus of control	10	2.5
External and internal locus of control	57	14.25
Internal locus of control	333	83.25
Very strong internal locus of control	0	0.0
Total score		
Min.- Max.	66.0 – 112.0	
Mean ± SD	100.1±8.6	
Percent score		
Min.- Max.	33.9-75.0	
Mean ± SD	64.4±7.7	

Table (3): Distribution of the students according to their overall Metacognitive awareness levels (n=400)

Overall Metacognitive Awareness level	(N=400)	%
Very low metacognitive awareness	0	0.0
Low metacognitive awareness	0	0.0
Average metacognitive awareness	119	29.75
High metacognitive awareness	281	70.25
Very high metacognitive awareness	0	0.0
Total score		
Min.- Max.	143.0-236.0	
Mean ± SD	188.8±22.7	
Percent score		
Min.- Max.	42.5-86.3	
Mean ± SD	64.1±10.7	

Table (4) Distribution of nursing students according to their academic performance (n=400)

Academic performance scale		Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
		No.	%	No.	%	No.	%	No.	%	No.	%
1	I made myself ready in all my subjects.	0	0.0	93	23.25	0	0.0	174	43.5	133	33.25
2	I pay attention and listen during every discussion	0	0.0	87	21.75	155	38.75	65	16.25	93	23.25
3	I want to get good grades in every subject.	0	0.0	87	21.75	67	16.75	159	39.75	87	21.75
4	I actively participate in every discussion	0	0.0	0	0.0	170	42.5	141	35.25	89	22.25
5	I start papers and projects as soon as they are assigned	0	0.0	58	14.5	44	11.0	232	58.0	66	16.5
6	I enjoy homework and activities because they help me improve my skills in every subject.	26	6.5	92	23.0	76	19.0	171	42.75	35	8.75
7	I exert more effort when I do difficult assignments.	0	0.0	36	9.0	157	39.25	132	33.0	75	18.75
8	Solving problems is a useful hobby for me.	20	5.0	157	39.25	100	25.0	63	15.75	60	15.00

Levels of Academic performance	No.	%
Failing academic performance	0	0.0
Poor academic performance	0	0.0
Moderate performance	107	26.75
Good performance	190	47.5
Excellent performance	103	25.75

Total score	
Min.- Max.	18.0-37.0
Mean ± SD	28.6±4.5

Table (5):   The relationship between the students' personal and academic data and their academic locus of control, metacognitive awareness and academic performance (n=400)

Socio-demographic data	Locus of control	Metacognitive awareness	Academic performance
	Mean ±SD	Mean ±SD	Mean ±SD
Age (years)			
18 - <20	98.95±9.20	196.68±25.05	29.42±5.39
20 - <22	100.66±8.95	185.86±22.37	28.50±4.26
≥22	99.53±5.13	188.51±15.29	27.55±3.54
F (p)	1.521 (0.220)	8.254* (<0.001*)	3.173* (0.043*)
Gender			
Male	99.69±10.64	187.93±23.04	27.36±4.62
Female	100.62±4.91	189.99±22.21	30.18±3.80
t (p)	1.167 (0.244)	0.902 (0.368)	6.677* (<0.001*)
Marital status			
Single	100.93±6.89	189.38±21.90	28.82±4.28
Married	89.04±17.60	181.57±30.79	25.64±6.15
t (p)	3.555* (0.001*)	1.317 (0.198)	2.681* (0.012*)
Last GPA			
C+	90.42±10.86	170.79±12.36	28.95±4.87
B-	100.77±10.12	189.16±24.62	28.36±5.25
B	97.39±9.16	187.38±11.00	26.39±2.13
B+	99.41±4.81	194.14±13.53	29.89±4.09
A-	105.53±3.76	188.04±35.27	29.91±4.78
F (p)	19.354*(<0.001*)	4.593* (0.001*)	10.220*(<0.001*)
Working condition			
Yes	98.89±10.72	189.91±21.33	27.31±4.51
No	101.39±5.28	187.68±24.03	29.97±4.08
t (p)	2.995* (0.003*)	0.981 (0.327)	6.186* (<0.001*)
If. Yes: how many Hours/week (n = 207)			
<20	96.33±12.33	204.44±26.23	30.52±5.41
20-<25	107.0±0.0	195.42±1.98	26.60±0.49
30- <35	66.0±0.0	143.0±0.0	18.0±0.0
35-<40	100.49±3.33	185.89±16.32	27.79±3.78

>40	95.0±0.0	176.0±0.0	24.0±0.0
F (p)	89.673*(<0.001*)	37.273*(<0.001*)	33.736*(<0.001*)
Academic level			
First	101.57±5.17	190.86±22.22	30.38±3.98
Second	100.30±9.54	193.49±22.07	27.63±4.64
Third	101.68±5.47	185.45±22.79	28.89±3.68
Fourth	93.88±13.41	181.0±22.34	25.73±4.69
F (p)	14.062*(<0.001*)	5.121* (0.002*)	19.585*(<0.001*)

F: F for ANOVA test   t: Student t-test   *: Statistically significant at $p \leq 0.05$

Table (6): **Correlation between the students' academic locus of control and their metacognitive awareness (N =400)**

	Locus of control	
	r	p
Knowledge of cognition	0.487*	<0.001*
Regulation of cognition	0.530*	<0.001*
Overall metacognitive awareness	**0.538***	**<0.001***

Table (7): **Correlation matrix between the students' academic locus of control and their academic performance (N =400)**

	r	p
Locus of control and academic performance	0.512*	<0.001*

r: Pearson coefficient   *: Statistically significant at $p \leq 0.05$

Table (8): **Correlation matrix between the students' academic locus of control and their metacognitive awareness and academic performance (N =400)**

	Locus of control		Metacognitive awareness		Academic performance	
	r	p	r	p	r	p
Locus of control						
Metacognitive	0.538*	<0.001*				

Locus of Control, Metacognitive Awareness, Academic Performance, Nursing Students.

awareness						
Academic performance	0.512*	<0.001*	0.754*	<0.001*		

r: Pearson coefficient　　　*: Statistically significant at p ≤ 0.05

Pearson correlation coefficient (r) value	Strength	Direction
More than 0.5 (***)	Strong	Positive
From 0.3 to 0.5 (**)	Moderate	Positive
From 0.0 to 0.3 (*)	Weak	positive
Zero (0.0)	No Correlation	
From 0.0 to -0.3(*)	Weak	Negative
From -0.3 to -0.5 (**)	Moderate	Negative
Less than -0.5 (***)	Strong	Negative

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