Learning Styles Preferences and Critical Thinking Disposition as A predictor of Student Goal Attainment

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Abstract

Nursing profession students have multiple challenges that stimulate them to use different learning styles and acquire more skills as problem solving, decision making, critical thinking and goal attainment. The **aim** of the study was to investigate the learning style preferences and critical thinking disposition as a predictor of student goal attainment. **Design**: was a cross sectional correlational design. **Setting** was Faculty of Nursing at Benha University and Minia University. **Subjects:** systematic random sample of 30% of total number of students during academic year 2020/2021 (sample size=1415). **Tools**: Three tools were used to collect data for this current study including I- learning styles preferences questionnaire, II-California critical thinking dispositions inventory scale and III- Goal attainment scale**. Results**: all students of both Faculties of Nursing (Benha and Minia Universities) scored high score for multi-modal learning style, and high score for critical thinking dispositions, as well high level of goal attainment. **Conclusion**: there were positive correlations between learning styles, critical thinking dispositions, as well goal attainment among nursing students at both study setting. **Recommendations**: Students should be encouraged to determine their learning style to help them be more critical thinker and have goal attainment skill.

Keywords: Critical Thinking Disposition, Goal Attainment, Learning Styles and Student

Introduction

Nursing profession students have multiple challenges to face that coming from health care settings complication and hazards; and the emergence of the technological, social, and medical aspects rapidly that have a relation to patient care. All of these multiple challenges can raise the tension and stress on nursing educators to choose an effective teaching strategy to have a qualified nurse for the reason of working in different health care settings and provide patient care competently; as well these challenges put an emphasis on the student to use different ways, methods and style to learn **(Falk& Dierking, 2019)**.

Moreover, learning style is a dominant aspect of student learning and acquiring essential knowledge; it is considered as a belief, behavior, or preference in which it can be utilized by people to ameliorate their learning in an unparalleled position. Therefore, learning styles cannot be the people's abilities but their preference in linking information and their learning preferences in capturing, organizing, transforming information and learning experiences **(Illeris, 2018)**.

Learning style is remarkable for many purposes; firstly, nursing students learning styles will mutate due to everyone is diverse naturally from one another. Secondly, propose the chance to teach by utilize a wide range of methods in a dynamic way that inspire a tiresome learning environment, so each one will entertain the lesson. By another words, learning and teaching can be merely words and not solid in reality **(Newton& Miah, 2019)**.

In addition, learning style preferences are adjusted by categorizing learners into four different manners (styles). The manners/ styles are based on a variety of senses, that namely visual, aural, reading, and kinesthetic; and the name of the model itself, generated from those senses using different VARK learning mode to be observed. So it was observed that visual learners offset about 20%, auditory 30%, read\ write 15%, and kinesthetic to be 35% of the population **(Riyadi et al., 2018)**.

Learning styles have six principles to be considered. Firstly, both the style the educator use to teach and the style the learner chooses to learn can be specified. Secondly, educators' had a requirement to defensive against relying on specific method or tool which only coincide the own learning style. Thirdly, preceptors are most advantageous when they aid students to recognize and learn by using their own style preferences. Fourthly, students should have the scope and chance to learn through their preferable style. Fifthly, students should be inveigled to have more than one style preference; finally, educators can evolve special activities for learning that advocate students' modality or style. So, the consciousness by using different strategies and using various methods and equipment considered to be a key for the growth used of different learning styles; also the use of different styles of learning can the help learner to master cognitive skills as problem- solving, decision making, creativity, critical thinking skills and dispositions **(Baker& Robinson, 2019)**.

One of crucial aspects of cognitive skills for the students is the acquisition of critical thinking. Critical thinking is believed to be a process of evaluating, following assumptions, explaining and appraising debates, portraying and exploring options, and fostering a reflective criticism to scope a summary that can be justified. Critical thinking cannot be as criticism, though it does invite for realizing attitudes, knowledge about evidence and analysis, and skills to consolidate those **(Sullivan& Decker, 2019)**. Critical thinkers must have the pivotal dispositions to be professional persons, (attributes, practices of mind, and attitudes) to exercise information and supplement the skills. Disposition is a harmonic motivation internally to catch problems and conduct effective decision making by thinking **(Profetto-McGrath, 2016)**.

The disposition of critical thinking is crucial to one to be an effective critical thinker, as the needful of cognitive skill essence. The critical thinker discriminatory were explored as "a group of attitudes that specify the personal disposition or penchant to be a critical thinker, professional and social life person". For that reason, the seven dispositional domains, which are components of general disposition of critical thinking that is to say: truth-seeking, open-mindedness, analyticity, systematicity, self-confidence, inquisitiveness, and cognitive maturity are very important for a student in which these dispositions help the student to foster goal attainment skill **(Facione et al., 2018)**.

Students' goal attainment regulates how they elucidate and say something in response to their environment. Teacher/ educator need to capture student motivation and foster the achievement goal orientations among students; in order to constructively inspire life-long studying skills in their students. An attainment of goal can result as a motivational credence or source for persons to streamline their own attitudes in keeping track of their goals **(Elliot, 2015)**. Attainment goal scale had been detached equally and systematically regulated into four achievement goals: (mastery approach/avoidance goals, performance approach/ avoidance goals).

The mastery-approach goals concentrate on gaining task-based or intrapersonal competence; mastery-avoidance goals encompass obviating intrapersonal incompetence; performance-approach goals are concentrating on acquiring normative competence; and performance-avoidance goals derive from frustrating normative incompetence **(Gavaza et al., 2014; Elliot& Murayama, 2008)**.

Significant of the study

Learning style has ideational action on the particular dimensions of teaching and learning processes. This learning style grants students to learn over the experiences just like that; style can enhancing different students to order and address their own learning. Therefore, the realization of learning styles can back up nursing students in grasp the value of learning and promoting the required skills for nursing practice **(Goldfinch& Hughes, 2017)**. Also, **Wangensteen et al. (2010)** reported in their study that majority 80% of the sharer declared a positive disposition of their critical thinking; with a high score for inquisitiveness subscale and a low score for truth-seeking subscale.

Also, **Janakiraman (2018)** assessed learning styles among students, and results showed that the visual, auditory and kinesthetic learning style was in the same distribution as the participated study student acquire the learning styles by (54.5%), (35.6%), and (4.0%) respectively. Therefore, it is prominent for students to realize their learning style because it encourages them to structure and formulate effective critical thinking disposition as well as to strengthen goal attainment.

Aim of the Study

The aim of the study was to investigate the learning style preferences and critical thinking disposition as a predictor of student goal attainment

Research questions

1- What are the learning styles preferences, critical thinking dispositions and levels of goal attainment among nursing students at studied settings?

2- Is there a relation between learning styles preferences, critical thinking dispositions and goal attainment among nursing students at studied settings?

3- Is there learning styles preferences and critical thinking disposition as a predictor of nursing student goal attainment?

Subjects and Methods

The present study was carried out through:

Technical design; Operational design; Administration design; and Statistical design.

Technical design

The technical design includes; the research settings, research design, subjects, and tools for data collection used in the study.

Research setting:

The study was conducted at the Faculty of Nursing, Benha University, which was established in 1993, accredited in 2016; as well as the Faculty of Nursing at Minia University which was established in 1995, and accredited in 2019. Both faculties had six scientific departments including Nursing Administration Department, Community Health Nursing Department, Psychiatric and Mental Health Nursing Department, Pediatric Nursing Department, Maternal and Newborn Health Nursing Department, and Medical-Surgical Nursing Department

Research design

A cross-sectional correlational research design was utilized

Subjects

A systematic random sample of nursing students was taken from the above- mentioned study setting consisted of 30% of a total number of who were enrolled in the academic year 2020-2021. They were selected randomly. The sample size was calculated by using the **Issac and Micheal (1995)** Formula which was computed as (N=p*30/100). The total number of nursing students from all four academic years at two facilities was (1415) while the final sample at Benha University was 735 and Minia University was 680 at the study time, distributed as follows:

Academic years	Benha University		Minia University	
	No of studied nursing students	(30%) of studied nursing students	No of studied nursing students	(30%) of studied nursing students
First year	750	225	830	250
Second year	653	200	609	190
Third year	544	170	387	120
Fourth year	459	140	401	120
Total	**2406**	**735**	**2227**	**680**

Tools of data collection:

The tools used to collect the data for this study were self- administered questionnaire which divided into four sections which are personal characteristics for the participants, learning styles preferences questionnaire, and California critical thinking dispositions inventory scale, and student goal attainment scale.

Section (1): Personal characteristics for the participants: This part was developed by the researchers and includes data related to the personal data of the studied sample such as age, academic year, residence, education qualification, and previous graduation level.

Section (2): Learning styles preferences questionnaire: It was developed by **Abdrahim, (2013)** and adapted from **Elsayed (2020)** and modified by researchers to assess learning styles preferences among undergraduate nursing students. Consisted of 34 items grouped under five dimensions as follows: visual (11 items), auditory (7 items), read /write (7items) and kinesthetic (9 items).

Scoring system: The total scores of the questionnaire were 68 grades. The scale measures learning style preferences on a 3 point Likert scale; "agree" was coded as 2, "neutral" as 1, and "disagree "as zero. These scores were summed up and were converted into a percentage score, and divided as Preferable if score ≥ 60%; and Not preferable if score < 60%.

Section (3): California critical thinking dispositions inventory scale: the scale developed by ***Facione et al., (1992) and adapted*** from ***(Ghoneimy, 2012)*** and targeted nursing students to measure dispositional characteristics. Consists of 75 items grouped into seven subscales: truth- seeking (12 items), open-mindedness (12 items), analyticity (11 items), systematicity (11 items), self-confidence (9 items), Inquisitiveness (10 items), and cognitive maturity (10 items). The source was consisted of 75 items and modified in this research to 74 items in response to the opinion of the jury that recommended the exclusion of one item of systematicity (Bank should make checking accounts a lot easier to understand) which is not relevant to nursing education.

Scoring system: The students responded using 6 - points: (1) strongly disagree, (2) disagree, (3) slightly disagree, (4) slightly agree, (5) agree, and (6) strongly agree. To score the California critical thinking disposition inventory, the sum of points for each dispositional characteristic was found and converted to the scale score after the exclusion of one item from the original scale.

- Negative disposition to critical thinking: if score is less than 50%
- Ambivalence disposition to critical thinking: if score 50% to 75%
- Positive disposition to critical thinking: if score is more than 75%

For total critical disposition score from 74 to 444 as follows:		
Negative disposition	if score is less than 50%	< 222 less than
Ambivalence disposition	if score 50% to 75%	222 ≥ 333 from 222 to 333
Positive disposition	if score is more than 75%	≥ 334 more than 334

Section (4): Goal attainment scale: the scale was adopted from **Gavaza et al., (2014)** based on Achievement Goal Questionnaire-Revised (AGQ-R; developed by **Elliot and Murayama, 2008**) and modified by researchers to be suitable for students. The scale contained 12 items divided into four dimensions Performance approach: PAP; Mastery approach: MAP; Performance avoidance: PAV; and Mastery avoidance: MAV in which (3 items for each dimension)

Scoring system: Students make ratings on five levels of attainment: (1) always not true, (2) usually untrue, (3) expected outcome, (4) somewhat true, and (5) always true.

- Low goal attainment approach: if score is less than 50%
- Moderate goal attainment approach: if score 50% to less than 75%

- High goal attainment approach: if score is more than 75%

Operational design:

The operational design includes preparatory phase, content validity, reliability, pilot study and field work.

- **Preparatory phase:**

It was included reviewing related literature and theoretical knowledge of various aspects of the study using books, articles, and internet's Periodicals and magazines to develop tools for data collection.

- **Validity and reliability:**

Content Validity

A bilingual group of five experts was selected to test the content and face validity of the tools. Necessary modifications and removing some questions were done to reach the final valid version of the tools. The tools were considered valid from the experts' perspective.

Reliability

The tools were tested to reliability by measuring their internal consistency using Cranach's alpha coefficient method. This turned to be (α = 0.89) for Learning styles preferences questionnaire tool I; (α=0.89) for California critical thinking dispositions inventory scale tool II and (α= 0.87) for student goal attainment scale tool III. This indicates a high degree of reliability for the study tools.

Ethical Considerations

Written approval to carry out the study was obtained from the faculty dean of nursing at Benha University and Minia University. Permission was attained from all Participants of the study after explanation of the study purpose, with making assurance on the anonymity of them and that their information will be secured and only used for the research purpose. Also, they had the right to withdraw from the study. This was followed by their agreement on participation in the study.

Pilot Study:

A pilot study was conducted to assess tools' clarity and applicability. It has also served in estimating the time needed for filling the questionnaires. It was done on 10% of the total subjects, (141) nursing students (73 from Benha University and 68 from Minia University. The time needed for filling all questionnaires related to nursing students was 20-25 minutes. No modification was done and pilot study was included in the main studied subjects and the final form was developed.

Field work:

Written official approval to conduct this research was obtained from the faculty dean of Nursing that was taken and delivered to Benha Faculty of Nursing and Minia Faculty of Nursing, to obtain their agreement to conduct the study after explaining its purpose. Informed consent was obtained from selected nursing students and the aim of the study was explained to them. The data collection took about two months from beginning ***November (2020)*** to the end of ***December (2020);*** with two visits per a week.

The data was gathered from nursing students at the end of the first term. The nursing student was interviewed in a group which contained from 10 to 20 students according to student time and explaining the purpose and the nature of the study and getting oral consent to participate in the research. At both faculties parallel (Benha and Minia universities) the researchers met with the nursing students from first and second years in the first month on (Saturday and Sunday); while the researchers met the third and fourth-year nursing students, two days (Monday and Tuesday) in the second month; as there were 2 to 4 groups interviewed at the day.

The researchers distributed the questionnaire sheets to the nursing students and presented to them for any clarification. The average time needed to sheets was 20-25 minutes. The questionnaire sheets were completed by nursing students then collected by the researcher to check each filling questionnaire and ensuring its completeness.

Limitation of study: The time for collecting data was a short period, and due to the fear form study suspension because of the COVID-19 virus, and students' distribution on groups and specific day to attend their courses;

the researchers put themselves under stress and time pressure and collected data from the students according to their suitable time, as well as they have been seeking for assistance from clinical instructors to help them in the collection of data from students during the break time of clinical day.

- **Administrative Design:**

Written official approval to conduct this research was obtained from the faculty dean of Nursing and delivered to Benha Faculty of Nursing and Minia Faculty of nursing that was taken, to obtain their agreement to conduct the study after explaining its purpose.

- **Statistical Analysis**

A compatible personal computer was used to store and analyzed data. The Statistical Package for Social Studies (SPSS), version 25 was used. Descriptive statistics were applied such as frequency, percentage distribution; mean and standard deviation. A comparison was performed using the chi-square test. Paired t-test was used to compare two mean scores. Correlation between variables was evaluated using Pearson's correlation coefficient (r). A highly significant level value was considered when $p \leq 0.001$.

Results

Table (1): Distribution of personal characteristics of nursing students at study setting (n=1415)

Personal characteristics	Nursing students			
	Benha University Nursing students (n=735)		Minia University Nursing students (n=680)	
	no	%	no	%
Age				
• <20	340	46.3	402	59.1
• From 20-22	370	50.3	267	39.3
• >22	25	3.4	11	1.6
Mean+ SD	19.72±1.50		19.32±1.22	
Academic year				
• First year	225	30.6	250	36.9
• Second year	200	27.2	190	27.9
• Third year	170	23.1	120	17.6
• Fourth year	140	19.1	120	17.6
Qualification				
• High School certificate	497	67.6	513	75.5
• Technical Institute of Healthy	131	17.8	73	10.7
• Technical Institute of Nursing	107	14.6	94	13.8
Last Academic Appreciation				
• Fair	30	4.1	43	6.3
• Good	100	13.5	134	19.7
• Very good	326	44.4	273	40.2
• Excellent	279	38	230	33.8
Residence				
• Rural	468	63.7	390	57.4
• Urban	267	36.3	290	42.6

Table (1) shows that, according to Benha University half of nursing students (50.3%) aged 20-22 years old with a mean score 19.72±1.50, and (30.6%) are recruited in the first academic year. Also, (67.6%) of nursing students have a high school certificates, (44.4%) had very good last academic appreciation, and (36.3%) living in rural areas. While Minia University, (59.1%) aged <20

years old, with a mean score 19.32+1.22; and (36.9%) are recruited in the first academic year. Also, (75.5%) of nursing students have a high school certificates, (40.2%) had very good last academic appreciation, and (57.4%) living in rural areas.

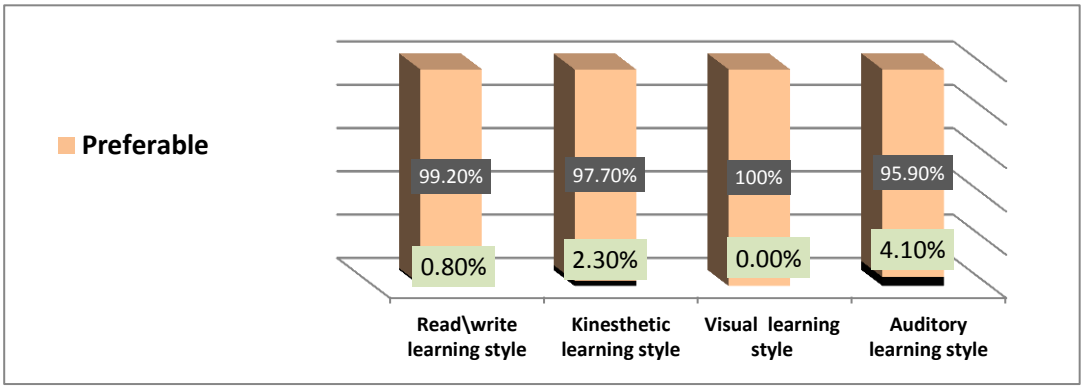

Figure (1): Distribution of the nursing students regarding total preferred learning styles (n=1415)

Figure (1): displays that, all (100%) of the studied sample had preferable for visual learning style, followed by (99.2%) prefer read\write learning style, next followed by (97.7%) prefer kinesthetic learning style, and finally followed by (95.9%) prefer auditory learning style.

Table (2): Distribution of the nursing students regarding total preferred learning styles regarding different academic years (n=1415)

preferred learning styles	Nursing students (n=1415)							
	First year (no =475)		Second year (no =390)		Third year (no =290)		Fourth year (no =260)	
	Un - preferabl	Preferable	Un - preferable	Preferabl	Un - preferable	Preferal le	Un - preferable	Preferabl
	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)
Auditory learning style	33 (6.9)	442 (93.1)	25 (6.4)	365 (93.6)	0 (0.0)	290 (100)	0 (0.0)	260 (100)
Visual learning style	0 (0.0)	475 (100)	0 (0.0)	390 (100)	0 (0.0)	290 (100)	0 (0.0)	260 (100)
Kinesthetic learning style	0 (0.0)	475 (100)	3 (0.7)	387 (99.3)	14 (4.8)	276 (95.2)	15 (5.8)	245 (94.2)
Read\write learning style	0 (0.0)	475 (100)	3 (0.5)	388 (99.5)	10 (3.4)	280 (96.6)	0 (0.0)	260 (100)

Table (2): Shows that, regarding the auditory learning style all (100%) of the study sample in the third and fourth academic year, while (93.1% and 93.6% respectively) in the first and second academic year respectively preferred the auditory learning style. Concerning visual learning style, all (100%) of the study sample in the different academic years preferred the visual learning style. For kinesthetic learning style, all (100%) of the study sample in the first academic year, but the student in the second, third, and fourth academic year (99.3%, 95.2 % and, 94.2% respectively) are preferred the kinesthetic learning style. Finally about read\write learning style all (100%) of the study sample in the first and fourth academic year, and (99.5% &96.6% respectively) of them in the second and third academic year preferred read/write learning style.

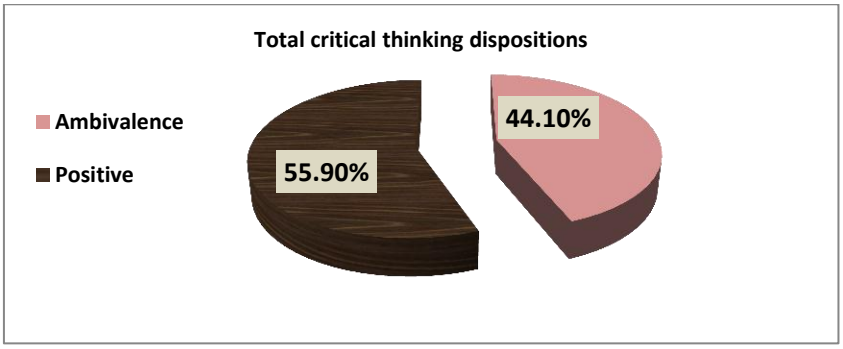

Figure (2): Distribution of the nursing students regarding total critical thinking dispositions (n=1415)

Figure (2): Shows that (55.9%) of the studied sample had positive critical thinking, while (44.1%) of them are ambivalence in critical thinking dispositions.

Table (3): Distribution of the nursing students dimensions and total of critical thinking regarding different academic years (n=1415)

Critical thinking dispositions	Nursing students (n=1415)											
	First year (no =475)			Second year (no =390)			Third year (no =290)			Fourth year (no =260)		
	Negative	Ambivalence	Positive	Negative	Ambivalence	Positive	Negative	Ambivalence	Positive	Negative	Ambivalence	Positive
	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)
Truth seeking	33 (6.9)	253 (53.3)	189 (39.8)	26 (6.7)	223 (57.2)	141 (36.2)	1 (0.3)	214 (73.8)	75 (25.9)	0 (0.0)	163 (62.7)	97 (37.3)
Open mindedness	0 (0.0)	216 (45.5)	259 (**54.5**)	0 (0.0)	199 (51)	191 (49)	0 (0.0)	198 (68.3)	92 (31.7)	0 (0.0)	165 (63.5)	95 (36.5)
Analyticity	0 (0.0)	214 (45.1)	261 (**54.9**)	0 (0.0)	182 (46.7)	208 (**53.3**)	0 (0.0)	127 (43.8)	163 (**56.2**)	0 (0.0)	101 (38.8)	159 (**61.2**)
Systematicity	0 (0.0)	252 (53.1)	223 (46.9)	0 (0.0)	217 (55.6)	173 (44.4)	0 (0.0)	189 (65.2)	101 (34.8)	0 (0.0)	160 (61.5)	100 (38.5)
Self-confidence	0 (0.0)	78 (16.4)	397 (**83.6**)	0 (0.0)	39 (10)	351 (**90**)	0 (0.0)	76 (26.2)	214 (**73.8**)	0 (0.0)	61 (23.5)	199 (**76.5**)
Inquisitiveness	0 (0.0)	152 (32)	323 (**68**)	0 (0.0)	139 (35.6)	251 (**64.4**)	0 (0.0)	112 (38.6)	178 (**61.4**)	0 (0.0)	83 (31.9)	177 (**68.1**)
Cognitive maturity	0 (0.0)	209 (44)	266 (**56**)	0 (0.0)	191 (49)	199 (**51**)	0 (0.0)	195 (67.2)	95 (32.8)	0 (0.0)	176 (67.7)	84 (32.3)
Total	0 (0.0)	214 (45.1)	261 (**54.9**)	0 (0.0)	181 (46.4)	209 (**53.6**)	0 (0.0)	126 (43.4)	164 (**56.6**)	0 (0.0)	103 (39.6)	157 (**60.4**)

Table (3) implies that, the studied sample among academic years is ambivalence (53.3%, 57.2%, 73.8%, and 62.7% respectively) for truth-seeking. Concerning the open- mindedness disposition, the studied sample of the second, third, and fourth year (51% 68.3% and 63.5% respectively) are ambivalent, while first year (54.5%) of them are positively open- mindedness. Regarding analyticity, the studied sample are positive in their analyticity disposition among all academic years (54.9%, 53.3%, 56.2%, and 61.2% respectively); and, they are ambivalence in systematicity among all academic years (53.1%, 55.6%, 56.2%, and 61.5% respectively); and they are positive in self-confidence among all academic year had (83.6%, 90%, 73.8%, and 76.5% respectively).

Also, the study sample among all academic year are positively in inquisitiveness (68, 64.4%, 61.4%, and 68.1% respectively), moreover, the student in the first and second academic year are positively cognitive maturity (56%, and 51% respectively); while (67.2%, and 67.7% respectively) of third and fourth-year students are ambivalence in cognitive maturity. Also, this table shows that the studied sample from all academic years first, second, third, and fourth (54.9%, 53.6%, 56.6%, and 60.4% respectively) have a positive score of total critical thinking disposition.

Table (4): Mean scores of the nursing students critical thinking disposition regarding selected universities (n=1415)

Critical thinking disposition	Nursing students (n=1415)		T- test (p- value)
	Benha University Nursing students (no =735)	Minia University Nursing students (n=680)	
	Mean + SD	Mean + SD	
Truth seeking	51.8571±9.37	51.8426±9.32	0.977
Open mindedness	55.1660±9.83	54.9279±9.69	0.647
Analyticity	52.2190±8.18	52.0250±8.07	0.654
Systematicity	45.1061±8.63	44.9735±8.48	0.771
Self-confidence	45.2463±5.55	45.1000±5.50	0.619
Inquisitiveness	49.0585±5.90	48.8632±5.82	0.532
Cognitive maturity	45.6231±9.10	45.4588±8.96	0.733
Total	344.2762±47.75	343.1912±46.96	0.667

No statistical significant difference (P>0.05)

Table (4): demonstrates that there are no statistically significant differences between Benha University and Minia University regarding critical thinking dispositions mean score and their dimensions mean score.

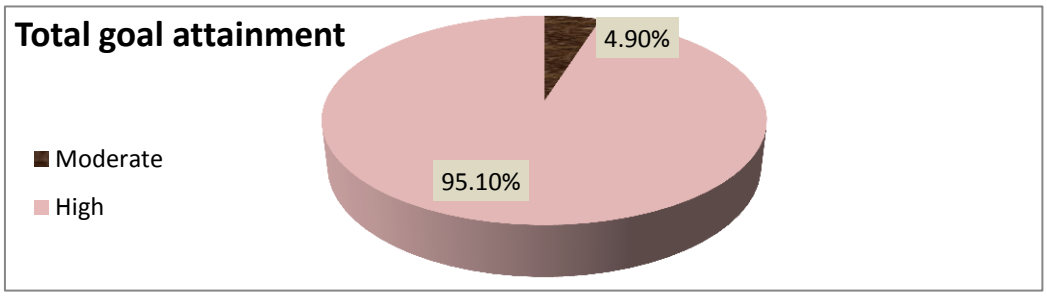

Figure (3): Distribution of the nursing students total goal attainment (n=1415)

Figure (3): declares that, (55.9%) of the studied sample had a high goal attainment score, while (4.9%) of them are moderate goal attainment.

Table (5): Distribution of the nursing students dimensions and total goal attainment regarding different academic years (n=1415)

Goal attainment	Nursing students (n=1415)											
	First year (no =475)			Second year (no =390)			Third year (no =290)			Fourth year (no =260)		
	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)
Performance approach: PAP	0 (0.0)	142 (29.9)	475 (70.1)	0 (0.0)	88 (22.6)	302 (77.4)	0 (0.0)	16 (5.5)	274 (94.5)	0 (0.0)	13 (5)	247 (95)
Mastery approach: MAP	0 (0.0)	0 (0.0)	475 (100)	0 (0.0)	0 (0.0)	390 (100)	0 (0.0)	0 (0.0)	290 (100)	0 (0.0)	0 (0.0)	260 (100)
Performance avoidance: PAV	0 (0.0)	117 (24.6)	358 (75.4)	0 (0.0)	80 (20.5)	310 (89.5)	0 (0.0)	1 (0.3)	289 (99.7)	0 (0.0)	0 (0.0)	260 (100)
Mastery avoidance: MAV	0 (0.0)	113 (23.8)	362 (76.2)	0 (0.0)	94 (24.1)	296 (75.9)	0 (0.0)	63 (21.7)	227 (78.3)	0 (0.0)	56 (21.5)	204 (78.5)
Total	0 (0.0)	37 (7.8)	438 (92.2)	0 (0.0)	32 (8.2)	358 (91.8)	0 (0.0)	1 (0.3)	289 (99.7)	0 (0.0)	0 (0.0)	260 (100)

Table (5): shows that, regarding performance approach (95% and 94.5%) of the studied sample had high-performance approach score in the fourth and third academic year respectively, while all (100%) of them had high mastery approach in the different academic years. Concerning

performance- avoidance, it was noted that (100% & 99.7%) of the studied sample had high performance - avoidance while (78.5% &78.3%) of them had high mastery avoidance in the fourth and third academic year respectively. Finally, the studied sample had high goal attainment in the fourth, third, first, and second academic year (100%, 99.7%, 92.2%, and 91.8% respectively).

Table (6): Mean scores of the nursing students goal attainment regarding selected universities (n=1415)

Goal attainment	Nursing students (n=1415)		t- test (p- value)
	Benha University Nursing students (no =735)	Minia University Nursing students (n=680)	
	Mean ± SD	Mean ± SD	
Performance approach: PAP	13.0490±2.15	13.0441±2.14	0.966
Mastery approach: MAP	13.8939±1.11	13.8824±1.108	0.846
Performance avoidance : PAV	13.3932±1.43	13.3765±1.42	0.826
Mastery avoidance: MAV	12.9714±2.16	12.9456±2.18	0.824
Total	53.3973±5.34	53.3456±5.36	0.856

No statistical significant difference (P>0.05) **t test: Independent t test**

Table (6): demonstrates that there are no statistically significant differences between Benha University and Minia **University** regarding goal attainment and their dimensions.

Table (7): Correlation between learning style preferences, Disposition thinking disposition and goal attainment among nursing students (n=1415)

Variables		Auditory learning style	Visual learning style	Kinesthetic learning style	Read\write learning style	Critical disposition	Goal attainment
Auditory learning style	r P	1	.439** .000	.284** .001	.078** .003	.079** .003	.250** .001
Visual learning style	r P	.439** .001	1	.518** .001	.497** .001	.223** .001	.373** .001
Kinesthetic learning style	r P	.284** .001	.518** .001	1	.497** .001	.212** .001	.252** .001
Read\write learning style	r P	.078** .003	.497** .001	.540** .001	1	.321** .001	.331** .001
Critical disposition	r P	.079** .003	.223** .001	.212** .001	.321** .001	1	.247** .001
Goal attainment	r P	.250** .001	.373** .001	.252** .001	.331** .001	.247** .001	1

****A highly statistical significant difference (P ≤ 0.001)**

Table (7): illustrates that there is a positive correlation between studied variables (learning style, critical thinking disposition and goal attainment) among nursing students p value= (0.001** to 0.003**)

Discussion

Determining the learning style of nursing students is a worthy skill in nursing education. And, educators knowing of students learning styles may help them to recognize and solve learning problems for students; as well as help them to encourage students to develop their competencies, skills, and achievement of goals **(Zeraati and Shojaian, 2008)**. Also, critical thinking (CT) plays a major role in developing students cognitively, clinically, professionally, and emotionally. Therefore assessing critical thinking skills and dispositions of students and developing these is essential for the provision of effective education for students **(Yücel and Koçak, 2010)**.

The present study displayed that, majority of the studied sample had a preferable learning styles for all styles; and highest used style was

visual learning style, followed by read\write learning style, next followed preferred style was kinesthetic, and finally followed by auditory learning style. From the researchers view of point, this result means that the students of nursing had a multi-model learning style; they prefer more than one style in order to acquire more knowledge and skills in their training and studying at both faculties.

This result is more preferable and accepted especially for nursing students because using more than one style can help students to acquire more knowledge and nursing skills which will help them to be competent nurse in their future careers. As nursing students should use visual style to see patients signs and be a good observer for nonverbal communication; use auditory style to help them hear the sound as chest sound, heart rate, blood pressure, and be good listener to patient and others to maintain communication; use kinesthetic style to manipulate or touch material to learn, and this style is a combination of visual and/or auditory, also this style can help the nursing student to provide care, for example, intramuscular injection or intravenous medication with maintaining patient safety and without hazards or pain; and finally they need to use read/write style to read patient chart effectively as well can write nursing notes and shift report. So, all learning styles are preferable to nursing students to be used and have multi-modal styles

This in line with **Salimi et al., (2013)** study results, who assessed " Visual, Aural, Read/Write, and Kinesthetic Learning Styles Preferences in Students of Isfahan University of Medical Sciences" and mentioned that medical students preferred use of multi-model learning style and male students use kinesthetic style of learning than female, who preferred the aural style.

Also, **Shams et al., (2021)** in their study about the learning style of medical students mentioned that most students had a multi-modal learning style. And between the multi-modal learning styles, the aural and visual learning styles were displayed as the highest and lowest frequent styles preferable styles by students, respectively.

Also, **Zeraati and Shojaian, (2008)** revealed that the dominant learning style among students was auditory, followed by read/write followed by kinesthetic and visual learners with low preference; but most of the students still showed a multi-modal learning preference. Based on the current study result **Syofyan and Siwi, (2018)** had agreed that there are 48 of students had visual style, 34 of them had auditory style, and 18 of them had kinesthetic learning style.

Also, many studies agreed in our study about learning style of students that most students had a multi-modal learning style, as well as **Prithishkumar, (2014), Peyman et al., (2014); Kharb et al., (2013), Farkas and Marone, (2016)** mentioned in their studies result in that majority of their study student had multi-modal learning styles.

Moreover, the result of the current study showed that, all or majority students in all academic year had a preferable score for all learning styles (visual; auditory; kinesthetic; and read\write learning style) as they had multi-modal style. Also, it was noted that the all students in both faculties of nursing (Benha and Minia Universities) preferred multi-modal styles with no statistical statistically difference in between both faculties students' mean scores. This may be due to the student characteristics were approximately the same in the two universities. The student age and level were near to each other. This result was in line with **Shete, (2017) and Ojeh et al., (2017)** whose studies agreed that a high percentage of students learning styles were multi-modal learning styles.

The current study showed that more than half the studied sample had positive critical thinking, while less than half of them are ambivalent critical thinking in both faculties of nursing at Benha and Minia University. This result might be due to the course curriculum the student had in the faculty, and the relation with their instructor which helps them to have some critical thinking; while all students of different academic years have critical thinking disposition fairly because they still need more programs, training courses, advanced teaching strategies that help them develop their critical thinking disposition.

This current study result was in accordance with **Kissal and Beser, (2009)** who assesses the relation between critical thinking dispositions and skills of problem-solving among nursing students; and they found that nursing students had moderate critical thinking dispositions. In addition, this result was in line with **Kim, (2016)** who assess nursing students' critical thinking disposition concerning communication and self-efficacy and revealed that the study sample of students regarding the critical thinking disposition was above the average score.

While this current study result not congruent with **Mahmoud and Mohamed, (2017)** in which their results presented that most of the staff nurses were ambivalent regarding the total critical thinking dispositions; and a minor percent of them had positive score toward critical thinking.

Also, this current study result was not in line with **Broadbear and Bierma, (2005)** in which their results indicated that only a very small portion of students (5.2%) of early stages had critical thinking dispositions. The results were in line with many authors who measure critical thinking dispositions among undergraduate students in general of many works as nursing, physics, environmental health, agriculture, and business; and mentioned that undergraduate student had a weak score of critical thinking dispositions **(Giancarlo and Facione, 2001; Bartlett & Cox, 2002; Jin, et al., 2004)**.

Also, **Demirhan and Köklükaya, (2014)** results displayed that the critical thinking dispositions of the studied sample were in general at moderate and low levels. And, study results of **Besoluk and Onder, (2010)** were similar to these findings.

The present study mentioned that the high percentage of the studied sample is ambivalence for truth-seeking, and are ambivalence for open mindedness. Concerning analyticity, the high percentage of the studied sample is positively in analyticity among all academic years. And, the high percentage of the studied sample is ambivalence in systematicity among all academic years. But the majority or more than three quarter of all academic year had a positive score for self-confidence, also more than two-thirds of the study sample among all academic year are positively in inquisitiveness, moreover, the student in the first and second academic year is positively cognitive maturity; while more than two-third of third and fourth year are ambivalence in cognitive maturity.

From view of the researchers point; the most positively disposed of critical thinking dispositions among nursing students were self-confidence and inquisitiveness; and this may be due to the nature of studies courses that help students to be more confident with themselves to deal well with different categories of workers and patients. Also, the faculty educator encourages the student to be more interested to acquire information and skills and to be more powerful.

Also, regarding the self-confidence domain; it reflects the trust of one in his or her process of reasoning. The result of the current study revealed that the mean score of these dispositional characteristics was most one had a high score among nursing students. This may be due to nursing students have a feeling of being valued members in the faculty community due to positive thoughts they have from their instructors; and the effective communication with their peers' teachers and hospital staff.

This result wasn't in line with **Ibrahim et al., (2020)** who revealed that nursing students had low mean scores regarding self-confidence. Also, this result is not in accordance with **Naguib, (2009)** who studied "Assessing the disposition of the undergraduate university nursing students toward critical thinking at faculty of nursing, Mina University" and mentioned that students of nursing are less confident. This result also consistent with **Foluso and Cesarina, (2014)** who had a study about "assessment of critical thinking disposition of nursing students in southwestern Nigeria" and agreed in their study that students had a weak positive dispositions toward self-confidence.

Also from our perspectives; student have inquisitiveness which is referring to one's intellectual curiosity and need for learning even when knowledge is not readily apparent. The nursing student had high positive score to it

due to their need to acquire lot of knowledge in relation to their work and learning, they had a major concern to be more generally good informed nurse who can manage different diagnosis of patient in hospital.

In agreement with these results; this was in line with **Mahmoud and Mohamed, (2017)** who mentioned that the meanest score among critical thinking dispositions was for the inquisitiveness subscale, which related to willingness and interest to know. Also, in nursing education; students must keep up an inquisitive nature and go ahead for seeking knowledge to practice with evidence-based standards (**Smith-Blair and Neighbors, 2003)**. Also, this result was in the same line with **Ibrahim et al., (2020)** who revealed that nursing students had a high positive inclination to Inquisitiveness; and which may be due to students' implosives to know a lot of knowledge related to values learning and work.

Moreover, the study was done by **Turabik, and Gun, (2016)** as well as **El Demerdash, (2011)** to assess student critical thinking dispositions, revealed that the meanest score among students were regarding inquisitiveness disposition with a high mean score.

Finally more than half of the studied sample had high positive critical thinking among all academic years' students. Also, the study demonstrated that there are no statistically significant differences between Benha University and Minia University regarding critical thinking dispositions means score and their dimensions mean score.

This result was not in accordance with **Mslm et al.** (**2020**) who concluded that the total score of critical thinking dispositions and its dimension of truth-seeking, open-mindedness, self-confidence and inquisitiveness had higher mean scores among third-year nursing students than first, second, and fourth-year with statistically significant differences.

Also, this result was not in line with **Kim et al., (2014)** who displayed that students of third-year had higher than others mean score of critical thinking with a significant difference. And **Kaya et al., (2018)** mentioned that fourth-year students scored in critical thinking a higher mean score with significant.

Moreover, the result of the present study implied, all students of four academic years (first, second, third, and fourth) had a high percent level regarding all dimensions of goal attainment (performance approach, mastery approach, performance-avoidance, and mastery avoidance). Finally, the majority of the studied sample had a high level of goal attainment in the fourth, third, first, and second academic year. Also, there were no statistically significant differences between Benha University and Minia University regarding goal achievement and their dimensions among nursing students.

These current results are attributed due to the student using of multi-modal learning styles could help them attain and achieve their goal in any way. Also, students can determine their objective and designated outcomes that would indicate differentiated levels of achievement and this force student to be motived and achieve their goals. In addition, the support and guidance the students received from their educators encourages them and motivate them to put goals and work on them to reach their progress. Moreover, the student of the Faculty of Nursing has admitted to Faculty with a higher grade of their secondary school which could be a sign to their awareness of putting goals to themselves and working on these goals with all of their power and energy.

This result was congruent with **Gavaza et al., (2014)** who agreed that most students had mastery-approach, mastery-avoidance, performance-approach, and/or performance-avoidance goal orientations with the high scores level. Accepting and having a mastery approach is preferable for nursing students, in which it is correlated to behaviors that improve their performance (e.g asking questions, use of deep approach of studying).

Consequently, having a mastery approach can help students in fostering their skills to be lifelong learners. Therefore, students need to develop mastery goals and lifelong learning habits by providing a competent and professional curriculum and learning environment. This result can be supported by

the results of **Garavalia et al., (2002); Senko et al., (2011)** in which their studied students had a mastery goal orientation.

Also, the nursing students in both faculties if nursing had a high level of performance-approach and performance-avoidance goal orientations. Performance-oriented students stimulate them for ends such as their score or grades, crossing a class, or practice well than others. Faculty educators should be ignoring negative competition between students and encourage them to have a goal of learning and acquiring competence or be mastery goal person. This finding was in line with **Perrot et al., (2001)** who reporting that many students are performance-oriented learners.

Finally, the current study revealed that there were positive correlations between studied variables (learning style, critical thinking disposition, and goal attainment) among nursing students. Therefore, when students are multi-modal learners and had a high critical thinking disposition this can improve student goal attainment.

As; learning style has a paramount emphasis on the lives of individuals especially a student of nursing; the multi-modal style can enhance student to have goal attainment skill in which they use different style to learn and acquire skills and knowledge to be competent that is his or her goal from the entrance of Faculty. They can be visual and observe patient sign and symptoms, behaviors and attitudes; they can be auditory to know well what other say and be a good communicator; they can be kinesthetic to practice nursing care practice well to the patient, and they can be read and write style to read patient report and investigation and document patient care in an effective manner; thus nursing student to achieve the goals they need to be multi-modal learner style.

Moreover, the multi-modal style can foster students to be more critical thinkers as when students use different learning styles they can think in different way, collect information, observe others, analyze data, interpret data, write patient nursing diagnoses effectively and solve patient problems with different and effective methods. Thus, using different styles and be a multi-modal learner will foster critical thinking among nursing students.

Also, when the nursing students are a more critical thinker and use all its disposition as truth-seeking; open-mindedness; analyticity; systematicity; self-confidence; inquisitiveness; and cognitive maturity; they can be aware of their performance as well their weakness in which this will foster them to determine their needs and goal. Thus the nursing students when they are a more critical thinking disposition; will determine their goals and put a good plan to achieve their goals.

Conclusion and recommendations

The study findings showed that the majority of students use a multi-modal learning style; as well the highest percentage of them had high scores for all critical thinking dispositions and the high percentage of total critical thinking; also, they have a high level of goal attainment and its dimensions. Thus, there were positive correlations between the three study variables (learning style, critical thinking disposition, and goal attainment) among nursing students.

These findings and conclusions can lead to recommendations as critical thinking as a process involved in the learning process, should be integrated into the nursing curriculum; and encourage the role of the educator in developing students' critical thinking skills. Students should be encouraged to determine their learning style to help them be more critical thinkers and have goal attainment skills. Education administrators should provide learning resources that cover all the learning styles to enhance their critical thinking and goal attainment skills.

Also, further research should be done to assess the mismatch between teaching styles and student learning styles and its relation to student critical thinking skills and styles. In addition, assess the relation between teaching styles with student goal attainment and academic achievement. Also, assess learning style education program and its effect on students' goal attainment and academic motivation.

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