Self-Directed Learning, Learner Styles and its Relation with Academic Achievement among Students at Faculty of Nursing

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Abstract

Background: In a rapidly changing and unstable world, many countries strive to remain competitive by updating the national education strategies, so the educators should encourage nursing students to use self direct learning, preferable learning style to enhance their academic achievement as well as their performance. **The study aimed to** investigate self-directed learning, learner styles and it's relation with academic achievement among students at Faculty of Nursing, Minia University. **Research design:** A descriptive correlation research design. **Sample:** consisted of a representative sample (30%) of the total number of undergraduate nursing students from the 2nd, 3rd, and 4th academic years (no. =585). **Setting::** The study was applied at the Faculty of Nursing, Minia University. **Tools of data collection:** two tools were used, 1st tool consisted of two parts the first part was personal data which include the student academic achievement and the others personal data as age, sex, etc. and the second part was Self- Directed Learning Readiness Scale and 2nd tool: Learner Style Questionnaire. **Results:** reveals that (55.6%) of nursing students have a below average self-directed learning, (71.8%) of them have learner visual style in learning, also(44.3%) of them have very good degree. **Conclusion:** There were positive correlations between the all visual as well as hepatic learner style, self direct learning and academic achievement, while there were no relation between auditory learning style and academic achievement. **Recommendations:** Support the students to move from traditional education to more active and independent education, relying on self-learning

Keywords: Academic Achievement, Learner Styles, Nursing Students, Self-Directed Learning.

Introduction

Nursing is a profession serving humanity. Modern nursing focuses not only on serving humanity but also on delivering smart care by competent and confident nursing professionals. Day by day, the role of nurse is expanding and getting more complex. Change in health care set-up and increased consumer demands making nursing education challenging for nursing undergraduates. Advancement in technology, social and medical environment scared budding nurses to face different kind of challenges. Also a global public health emergency, the COVID-19 pandemic has resulted in an increase in university students' perception of stress. Facing the double pressure of the sudden pandemic and online learning, college students may have become more susceptible to anxiety and pressure **(Husky et al., 2020)**.

In addition this world of rapid development, learning opportunities are virtually limitless. A sense of responsibility and a strong initiative is crucial on behalf of the learner to exploit the available resources and compete with the fast progressing world. This is what makes the concept of self-directed learning (SDL) relevant. It enables the students to survive in today's world. The SDL defined as students' ability to decide what and how they want to learn. The SDL is considered a fundamental aspect of human maturation **(Doo et al., 2023)**.

Furthermore, as a vital element in the development of life-long learning, SDL is an integral skill of the 21st-century nurse professional. Mounting evidence has strongly linked SDL with enhanced learning outcomes and academic performance in nursing students as well as ensuring adequate preparation of nursing students for their future role as healthcare professionals **(Rascón-Hernán et al., 2019).**

Nursing students who have high SDL skills tend to exhibit better learning and studying strategies, such as the ability to deduce the most relevant information, relate previous learning with knowledge, master test-taking skills, and enjoy a more optimistic attitude. Further more, their awareness of their own learning process puts nursing students in a better position to initiate and plan for future learning. In view of the essential nature of SDL, teaching and learning strategies that use this approach must be deliberately incorporated into the nursing curriculum **(Ojekou & Okanlawon, 2019).**

Also SDL goes by the principle of adult learning. The literature employs various terms for this educational method, including student-centered learning, self-instruction, self- teaching, prescriptive learning, and individualized learning. Meanwhile, learning styles (LSs) represent an individual learner's preferred set of cognitive and behavioral feedback concerning a learning task. LS influence learners' motivation and attitude to learn and may affect their academic performance **(Ihudiebube-Splendor & Chikeme, 2020; Zhou et al., 2023).**

The concept of learning styles(LSs) has received considerable attention in the empirical literature and many theories have been proposed in order to better understand the dynamic process of learning) .Term of "LS refers to this view that different people learn information in different ways "and "refers to the concept that individuals differ in regard to what mode of instruction or study is most effective for them" .While alternative approaches to learning can be used successfully, it is thought that students will learn more quickly and easily if they are able to utilize their preferred style . The value of developing awareness of LS can help students to recognize their strengths, weakness. They work more

efficiently when self-directed in learning and They develop effective collaborative relationships with others **(Sam, 2023).**

In the SDL as well as the preferable LSs, the individual takes the initiative and the responsibility for what occurs. Individuals select, manage, and assess their own learning activities, which can be pursued at any time, in any place, through any means, at any age. self-directed learning' describes a process by which individuals take the initiative, with or without the assistance of others, in diagnosing their learning needs, formulating learning goals, identify human and material resources for learning, choosing and implement appropriate learning strategies, and evaluating learning outcome. In SDL gradually Control transferred from the teacher to the learner and learners in the learning goals and how to carry out a task have greater independence. The SDL emphasizes on the role of motivation and determination learners at the beginning and continuation of efforts to achieve the goals as well as enhance their academic achievements **(Albulescu et al., 2023).**

Dangol and Shrestha, (2019) mentioned that academic achievement is the total outcome of learning among the students which is achieved through teaching learning process. It signifies the effectiveness of educational process which is conducted in the schools as the classroom activities as well as indoor activities. It deals with the class examination results **(Magnus &Peresetsky, 2018).**

Academic achievement represents the performance outcome, indicates the degree to which an individual has fulfilled the certain goals. Furthermore, it focuses on those activities which specifically concentrate in instructional environments of school **(Castellane, 2019)**

Moreover, academic achievement is representing one of the most widely studied outcomes in educational research and assessment. So, nursing education is a substantial personal investment of time and effort for the student and a major investment of government in many countries, therefore, supporting students' success in their academic education. Also, trying to identify predictors of academic success to ensure quality education and high completion rates **(Bayoumy & Alsayed, 2021)**

Significance of the study

Self-directed learning is an essential skill required in the 21st century educational world. This learning approach increases the motivation of students to learn, since they are the makers of their own knowledge, they experience a sense of independence while learning. SDL process keeps them engaged, since now they have to acquire knowledge on their own, and apply it along with their skills to find solutions to their problems that evolve in learning and be encouraged for life-long learning **(Karatas & Zeybek, 2020).**

In nursing, several researches recognized that SDL has become an essential foundation for 21st century learners. In recent years teachers are giving importance to technology based education such as student centered education, technology based education, hands-on training, lab-based education and e-learning in the classrooms. The underlying rationale seems to be that students are better able to learn when they can control the flow of their experience, or when their learning is "self-directed." Teachers are also has an important place in self-directed learning environment. Their constant support and motivation is required for accelerating the effectiveness and also increasing the rate of achievement **(Brandt, 2020).**

In India ,there was study done about the relationship between self-directed learning and achievement in information technology of students at secondary level at School of Pedagogical Sciences, Mahatma Gandhi University by **Jaleel and OM (2017)** which focused on determining whether there exist any significant relationship between self-directed learning and achievement in information technology of students at secondary level for the total sample and subsample based on gender and the study revealed that there exists a significant positive correlation between achievement in information technology and SDL for the total sample and the subsamples .

In Egypt, there was study done about garrison's model of self-directed learning preliminary validation and relationship to academic achievement at Minia University by **Abd-El-Fattah (2010)**, the study revealed that there is a positive relationship between SDL aptitude and academic achievement.

Although through the researcher working as a teacher at nursing schools, where it was found that self-directed learning is essential in assisting nursing student to meet the challenges presented in today's health care environment and identifying learner style can be a useful way to optimize learning opportunities, and can help learners to recognize their strengths and areas for development in the way that learning takes place which can effect on academic achievement. So, the researcher introducing this study about self-directed learning, learner styles and it's relation with academic achievement among students at Faculty of Nursing, Minia university.

Aim of the Study:

The aim of the current study is to investigate self-directed learning, learner styles and it's relation with academic achievement among students at Faculty of Nursing, Minia University.

Research Questions:

1. Are there a relation between self-directed learning, learner styles and his academic achievement among students at Faculty of Nursing, Minia University?
2. Are there a relation between personal data, self-directed learning, learner styles and his academic achievement among students at Faculty of Nursing, Minia University?

Subjects and Methods:
Research design:

A descriptive correlation research design was utilized to achieve the aim of the current research.

Setting:

This study was conducted in the Faculty of Nursing, Minia University, Egypt.

Subjects:

The study subject was selected by using systematic random sample from all undergraduate nursing students of the Faculty of Nursing- Minia University. It consisted of a representative sample (30%) of nursing students from the 2nd, 3rd, and 4th academic years during the "second semester" of the academic year 2021 -2022 (total number 585). The subjects were distributed as the 2nd year= 285, 3rd year= 180, and the 4th year= 120 student.

Data Collection Tools:

Data were collected by two tools divided as following

Tool (I): Self- Directed Learning Readiness Scale (SDLRS)

This tool was dividing into two parts:

Part I: Personal Data Sheet:

It used to collect data about nursing students. It included the items related to code of the student, age, gender, residence, and the academic year.

Part II: Self-Directed Learning Readiness Scale (SDLRS),

This scale developed by **Guglielmino& Hillard (2007).** to measure readiness for self-directed learning. It consists of (58) items with 5 likert scale ranged as (1) "almost never true of me," (2) "not often true of me," (3) "sometimes true of me," (4) "usually true of me," or (5) "almost always true of me.

The scoring system ranged from (58-290) and it divided into three levels as follow:

- Below average among nursing students ranged from 58 to 201
- Average among nursing students ranged from 202 to 226
- Above average among nursing students ranged from 227 to 290

Tool (II): Learner Style Questionnaire

This questionnaire developed by **O'Brien (1989).** It consists of (30) items with 3 points likert scale ranged as (1)" Never applies to me", (2)" Sometimes applies to me" ,and (3)" Often applies to me. " It is divided to 3 dimensions as follows visual (10 items), auditory(10 items) ,and haptic (or kinetics) (10 items).

Scoring system:

Each student receives a score for each learning style; the scores can range from 10 to 30. Often, there will be two styles that have the same or close to the same score.

Flat scores in the high 20 indicate that the student has developed all three learning channels and is able to use the modality that best fits the task. Flat scores below 20 indicate that the student has not yet developed a strong learning channel preference.

Validity of the tool:

The tools were submitted to a jury of five experts in the field of nursing administration as (three assistant professor, as well as one professor) from Minia University and one professor from Assuit University; each expert panel was asked to examine the instruments for their content validity, coverage, clarity, wording, length, format, applicability, and overall appearance. No modification was done.

Reliability of the tool:

Reliability of the tools was performed to confirm the consistency of the tools. The internal consistency was measured to identify the extent to which the items of the tools measured what it was intended to measure. Also, the Cronbach alpha test was used for measuring the reliability of tools and it was (0.901) for SDLRS, and (0.891) for learner style questionnaire.

Pilot study:

A pilot study was conducted on (10%) of nursing students (students = 58) (of the total study subjects) before starting the fieldwork to test the clarity and applicability of items included in the tools. Estimated time required for filling the tools was about 22-25 min, for each sheet; the tools were applicable, didn't need changes and it was added to the final results. The pilot study subjects were included from the total number of study subjects.

Data collection procedure:

Official Permissions were obtained from administrative authorities before the data collection procedure (from the dean of the faculty, the vice dean for education and student affairs as well as head of the department). During each classroom visit, the researchers took permission from the head of the department, the clinical coordinators, and the clinical instructors to work with students at the beginning or the end of the clinical section according to the appropriate time for students. The sheets were given individually to the students who participated in this research and they were given time to respond to all items in the tools. Also, the data were received according to each student's time. Data were collected from (2nd, 3rd, and 4th -year faculty students) during the second semester of the academic year 2021- 2022 (from end of February to the end of May).

Ethical Considerations:

An official letter was granted from the Ethical Committee of Research as well as the Faculty Dean. Before conducting the pilot study as well as the actual study, oral consent was obtained from the students after explaining the aim of this research. The study subjects had the right to refuse to participate or withdraw from the study without any rationale at any time. The study subjects' privacy was considered during the collection of data. Participants were assured that all their data were highly confidential; anonymity was also assured by assigning a number for each nursing student instead of names to protect their privacy.

Statistical analysis:

The collected data were tabulated, computerized, analyzed, and summarized by using descriptive statistical tests to test research questions using the SPSS version (25). Qualitative data were expressed as frequency and percentage. Probability (P-value) is the degree of significance, less than 0.05 was considered significant. The following statistical tests were used for the analysis of numeric data such as (the ANOVA test, t-test, and Correlation analysis)

Results

Table (1): Percentage distribution of the nursing students personal data (no=585).

Items	Second year Nursing student (no= 285)	
	no.	**%**
Age		
• ≤20	214	36.6
• 21-22	339	57.9
• 23->24	32	5.5
Mean ± SD	20.88±.981	
Gender		
• Male	251	42.9
• Female	334	57.1
Residence		
• Rural	444	75.9
• Urban	141	24.1
Academic year		
• Second	285	48.7
• Third	180	30.8
• Fourth	120	20.5

Table (1) mentions that (57.9. %) of nursing students' age ranged from (21-22) years old with mean± SD (20.88±.981). Moreover (57.1%) of them are females, concerning the residence there are (75.9%) of them are living in the rural area. Regarding academic year (48.7 %) of nursing students are in the second year, while (30.8%) of them are in the third year of education.
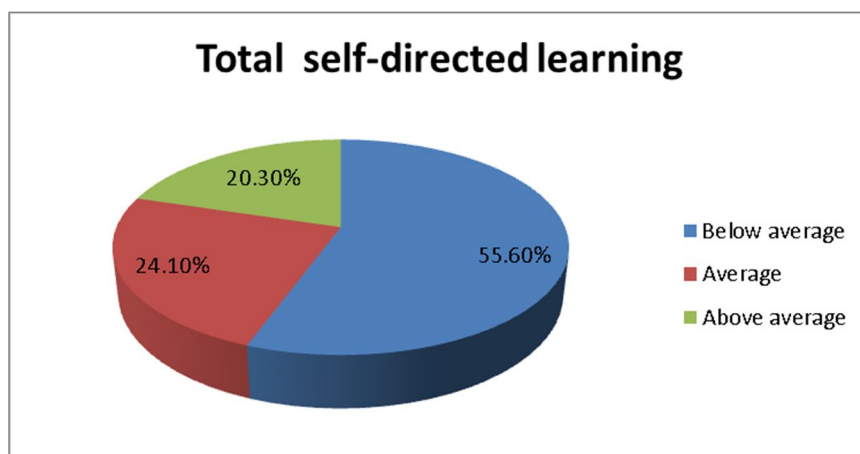

Figure (1): Percentage distribution of the nursing students total self-directed learning (no=585).

Figure (1) illustrates that (55.6%) of nursing students have a below average self-directed learning, while (24.1%) of them have average self-directed learning . In addition (20.3%) of them have above average for self-directed learning.
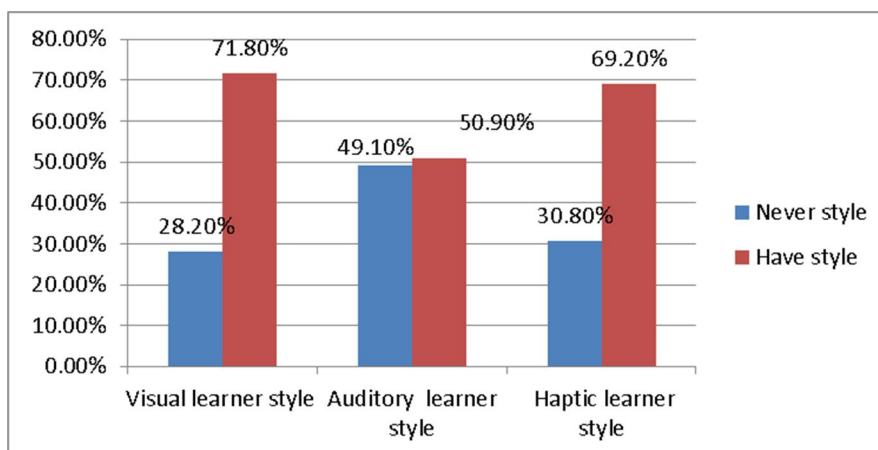

Figure (2): Percentage distribution of the nursing students' learner style (no=585).

Figure (2) illustrates that (71.8%) of nursing students have learner visual style in learning, while(69.2%) of them have haptic style in learning. In addition (50.9%) of them have auditory style in learning.
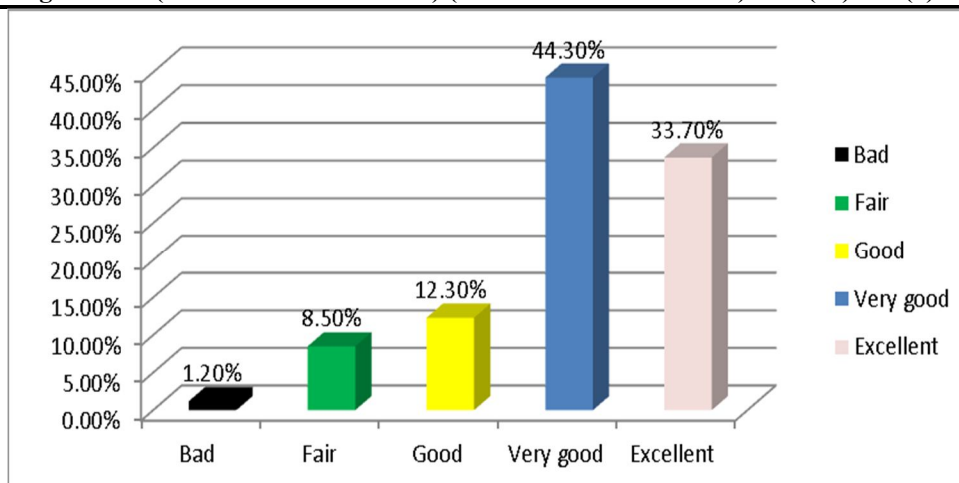
Figure (3): Percentage distribution of the nursing students academic achievement (no.=585).

Figure (3) states that (44.3%) of nursing students have very good degree, while (33.7%) of them have excellent degree, also (12.3%) of them have good degree.

Table (2): Relation between nursing student's personal data and self-directing learning (no.= 585).

Personal data	Mean ± SD
Age	
• ≤20	199.92±34.07
• 21-22	194.97±34.51
• 23->24	194.88±39.07
Anova (p-value)	**1.391 (.25 NS)**
Gender	
• Male	195.68±37.64
• Female	197.60±32.23
T- test(p-value)	**4.859(.028*)**
Residence	
• Rural	198.12±32.87
• Urban	192.55±39.52
T- test(p-value)	**9.537(.002**)**
Academic year	
• Second	203.88±34.57
• Third	191.39±34.57
• Fourth	187.98±34.57
Anova (p-value)	**12.517 (.001**)**

Table (2) mentions that statistically significant relations between nursing students' self-directing learning and their (gender, residence, and academic year) with (P-value= .028, .002 and .001 respectively). While, there are no statistically significant relations between nursing students' self-directing learning and their (age) with (P-value= .25).

Table (3): Relation between nursing student's personal data and visual style of learning (no.= 585).

Personal data	Mean ± SD
Age	
• ≤20	21.36±3.94
• 21-22	21.19±3.82
• 23->24	20.91±3.43
Anova (p-value)	**.242 (.785 NS)**
Gender	
• Male	21.04±4.02
• Female	21.38±3.70
T- test(p-value)	**1.093(.296NS)**
Residence	
• Rural	21.46±3.66
• Urban	20.52±4.29
T- test(p-value)	**3.235(.073NS)**
Academic year	
• Second	21.50±3.70
• Third	21.04±4.05
• Fourth	20.90±3.83
Anova (p-value)	**1.345(.261NS)**

Table (3) clarifies that no statistically significant relations between nursing students' visual style of learning and their personal data.

Table (4): Relation between nursing student's personal data and auditory style of learning (no.= 585).

Personal data	Mean ± SD
Age	
• ≤20	19.64±3.84
• 21-22	19.57±3.74
• 23->24	20.09±3.34
Anova (p-value)	**.286 (.751NS)**
Gender	
• Male	19.73±3.76
• Female	19.54±3.75
T- test(p-value)	**.118(.731NS)**
Residence	
• Rural	19.69±3.60
• Urban	19.42±4.20
T- test(p-value)	**1.243(.265NS)**
Academic year	
• Second	19.80±3.79
• Third	18.97±3.62
• Fourth	20.18±3.76
Anova (p-value)	**4.419(.012*)**

Table (4) clarifies that statistically significant relations between nursing students' auditory style of learning and their (academic year) with (P-value= .012). While, there are no statistically significant relations between nursing students' auditory style of learning and their (age, gender, and residence) with (P-value= .751, .731 and .265 respectively).

Table (5): Relation between nursing student's personal data and haptic style of learning (no.= 585).

Personal data	Mean ± SD
Age	
• ≤20	20.58±4.05
• 21-22	21.19±3.39
• 23->24	19.78±3.72
Anova (p-value)	**3.334(.036*)**
Gender	
• Male	20.93±3.82
• Female	20.86±3.57
T- test(p-value)	**.491(.484NS)**
Residence	
• Rural	21.01±3.59
• Urban	20.52±3.93
T- test(p-value)	**.946(.331NS)**
Academic year	
• Second	20.87±3.77
• Third	21.06±3.58
• Fourth	20.68±3.62
Anova (p-value)	**.387(.679NS)**

Table (5) illustrates that statistically significant relations between nursing students' haptic style of learning and their (age) with (P-value= .036). While, there are no statistically significant relations between nursing students' haptic style of learning and their (gender, residence and academic year) with (P-value= .484, .331 and .679 respectively).

Table (6): Relation between nursing student's personal data and academic achievement (no.= 585).

Personal data	Mean ± SD
Age	
• ≤20	23.97± 1.99
• 21-22	24.04±1.92
• 23->24	23.91±1.95
Anova (p-value)	**.582(.559NS)**
Gender	
• Male	23.79±1.98
• Female	24.17± .89
T- test(p-value)	**3.299(.070NS)**
Residence	
• Rural	23.99±1.96
• Urban	24.06±1.95
T- test(p-value)	**.723(.395NS)**
Academic year	
• Second	23.95±2.98
• Third	24.11±1.91
• Fourth	23.99± 2.93
Anova (p-value)	**1.646(.194NS)**

Table (6) illustrates that no statistically significant relations between nursing students' academic achievement and their personal data

Table (7) Correlation matrix between study variables among nursing students (no.=585)

Variable	study variables									
	self-directed learning		Visual learning style		Auditory learning style		Haptic learning style		Academic achievement	
	r	P	r	P	r	P	r	P	r	P
self-directed learning			.324**	.001	.137**	.001	.175**	.001	.131**	.001
Visual learning style	.324**	.001			.190**	.001	.290**	.001	.028	.493
Auditory learning style	.137**	.001	.190**	.001			.235**	.001	-.054	.193
Haptic learning style	.175**	.001	.290**	.001	.235**	.001			.040	.337
Academic achievement	.131**	.001	.028	.493	-.054	.193	.040	.337		

*p≤0.05 (highly significant), PCC: P – value based on Pearson correlation coefficient

Table (7) shows that there are positive correlations between the study(self-directed learning, learner style as well as academic achievement) except between auditory learning style and academic achievement

Discussion

Present era demands students to become lifelong learner throughout their career and in academic choices. Higher education also demands that students should aim at direct learning. It can be achieved collaboratively while learning and working. The SDL always appears beneficial for the students as they can work and study simultaneously. Selfdirected learning is a method which can measure students' learning desires, safeguard their appropriate learning, lead them towards deliberate actions and measure their subsequent knowledge **(Khalid et al., 2020).**

Also in medical sciences, the ability to guide and tailor the individual learning experiences is an important issue for success. Constant changes in accessibility of information have doubled the importance of preparing graduates who are able to guide their own self-learning; therefore, empowering students to acquire the skills required in initiating SDL should be one of the ultimate goals of the curriculum ((**Tohidi et al., 2019).**

Concerning to nursing students' personal data, the current study revealed that more than half of the nursing students' age ranged between (21-22) years**.** Regarding their residence about three quarters of them living in rural areas. For the nursing students gender it was noted that more than half of them were females. As for their academic years it was observed that near to half of them were in the second year.

Regarding the total of nursing students' self-directed learning, the present study revealed that more than half of nursing students had a below average self-directed learning. This could be due to clinical experiences for nursing students do not expose them to a variety of challenges, so they cannot identify areas in which they need to expand their knowledge and skills in order to become more independent and secure in their decision-making and self-learning process. Moreover, stress and academic activities workloads of nursing students make them less interested by creating new self-directed learning ways.

This finding is supported by the finding of **Chen et al. (2022),** who reported that more than half of the students participating in this study had below-average self- directed learning readiness scores.

While the finding is not consistent with **Abdou et al. (2021),** revealed that that three quarter of nursing students were high readiness for self-directed learning.

Regarding the total of the nursing students' learner style, the current study noted that the highest percentage of the nursing students have learner visual style in learning. This could be due to the students' ability to understand and retain visual information's through visual learning styles such as, power point slides, videos, posters, books, images. Also, more students able to receive large

amount of information and knowledge by visual media and strategies. And, this form of learning style improves students critical thinking and creativity.

This finding is supported by **Alharbi et al. (2017),** who stated that the highest percentage of the students have a visual learning style and it represent the commonest learning preferences and used among the nursing students. Also, based on the findings of **Hidayah et al. (2022),** in which they showed that more than half of the students tend to have a visual learning style as the dominant learning style, followed by an auditory learning style in second place, and a kinesthetic learning style in last place.

While the finding is not consistent with **Mašić et al. (2020),** who showed that the auditory learning style is the most preferred learning style for most students. Also, **Latha Venkatesan et al. (2019),** the highest percentage of the nursing students preferred individual learning style of kinesthetic and auditory.

Regarding the nursing students' academic achievement, the current study revealed that more than two fifths of nursing students have very good degree. This could be due to the nursing students' commitment with their courses and learning activities which lead to improve their academic outcome. Also, the student's engagement and participations on the learning related clinical practices and activities assists them to be abler to achieve best results.

This finding is not consistent with the finding of **Abdallah et al. (2020)** who revealed that more than half of nursing students (58.6%) had very good degree of academic achievement.

Concerning to the relation between nursing student's personal data and the study variables. Regarding the relation between nursing student's personal data and self-directing learning, the current study revealed that there was a statistically significant relation between nursing students' self-directing learning and their (gender, residence, and academic year).

This could be because of a number of the students prefer to use and develop new self-learning strategies and methods depend on their readiness, such as high educational grades are willing to use self-directed learning than younger students, also females are intrinsically motivated and use this strategy than male's students. Moreover, urbanization student's more used to these learning strategies than rural learners.

This finding is attributed by **Chen et al. (2022)** who reported in their study that there was a positive correlation between SDL and age/educational levels, and gender of the students. Also, the finding is supported by **Grande et al. (2022)** who stated that in terms of gender, the study discovered that female nursing students are more SDL ready

compared with their male counterparts. Moreover, **Koirala and Kafle, (2021)** who reported socio demographic characteristics as gender, age, and educational level effect on self-directed learning readiness score.

While, the finding is not aligned with **Abdou et al. (2021)** who found that no statistically significant association between personal characteristics and overall self-learning readiness score. And, **Mohoaduba (2018)** who found that there was no consistent relationship between demographics and overall self-directed learning readiness score

Regarding the relation between nursing student's personal data and visual style of learning, the current study revealed that there were no statistically significant relations between nursing students' visual style of learning and their personal data. This could be related to the highly effectiveness of the modern visual styles of learning by all students without any exception or interference with their demographic data.

This finding is consistent with **Li et al., (2022)** who concluded that there were no relations between personal data of nursing students and their visual style of learning.

Regarding the relation between nursing student's personal data and auditory style of learning, the presented study revealed that there were statistically significant relations between nursing students' auditory style of learning and their (academic year). This could be due to the difference between the nursing students academic level in accepting and utilizing the auditory learning style. Such as the second year students used to learn by this style since the secondary school levels, while the third and the fourth year students not prefer using or receiving their learning lectures by this style than other creative styles.

This finding is in the same line with **Mašić et al. (2020)** who stated that there was a positive relation between students' levels and their auditory learning style.

Regarding the relation between nursing student's personal data and haptic style of learning, the actually study revealed that there were statistically significant relations between nursing students' haptic style of learning and their (age). This could be related to the students' maturity, such as senior students able to determine their needs and the way can control their feelings, decisions, thinking, and interactions. While junior's students are still unable to detect their demands and prefer follow the traditional visual and auditory styles of learning by their educators.

This finding is not attributed by the finding of **Alshammari et al. (2019)** who reported that there was no significant difference in the haptic learning style of the students regarding their age.

Regarding the relation between nursing student's personal data and their academic achievement, the current study revealed that there were no statistically significant relations between nursing students' academic achievement and their personal data.

This could be due to the student's goals and abilities to achievement and pass from grade to another is not dependent on their age or residence or gender specially in nursing education, many students realize the importance and difficulties of the learning process and try to devote their efforts to achieve the best outcome regardless any other obstacles faces them. So, it is not needed for any personal variables that enable them to achieve their outcome score.

This finding is supported by **Shirazi and Heidari, (2019)** in which they stated that there was no significant

relationship between any of the demographic variables such as age and marital status and academic achievement.

While the finding is not aligned with **Grande et al. (2022)** who revealed that several personal and socioeconomic issues influenced nursing students' success, so it is critical to recognize the factors that drive students to complete their nursing degrees.

Concerning to the correlation between (self-directed learning, learner style as well as academic achievement) **among nursing students.** The current study revealed that there was a positive statistically significance correlation between self-directed learning and the nursing students' academic achievement. From the researchers' point of view, it could be due to the availability of efficient abilities and characteristics for the students who can manage and improve their self-learning process, which at the same time can enhance their achievement level. Such as students who have self- stem, self-esteem, time management, critical thinking, and commitment.

This finding is in the same line with **Siddiqui et al. (2021)** who reported that SDL was positively correlated to academic performance. Also, the study results supported by **Sun et al. (2022)** in which they revealed that SDL attitude and approach positively related to learning performances and success level.

While this finding is not supported by **Hussain et al. (2023)** who stated that no significant association was reported between self-directed learning readiness and academic achievement of student teachers in Pakistan.

Also, the present study showed that there was statistically significance correlation between self-directed learning and the learning styles (visual- auditory, and haptic). This could be due to the more nursing educators and the students determine and utilize an effective and suitable learning style, the students can detect their self-learning strategies and improve their learning needs. Also, self-directed learning is important on nursing students' role which can be achieved by successful learning styles.

This finding is not supported by the finding of **Megahed et al. (2019)** who concluded that there was no statistically significant relation between self-directed learning and learning styles. Also, **Grande et al. (2022)** in which they found that there was no connection between SDL readiness and nursing students' learning styles in a report

Moreover, there were a statistically significance correlation between students' academic achievement and the learning styles (visual- and haptic) only. This could be due to the special teaching conditions of the nursing education process that include theoretical and practical activities, which make the nursing students more attached with visual and haptic styles of education for retaining and utilizing their knowledge and practices. And, this all can improve their academic achievement level. Moreover, this types of learning styles become more attractive and effective for the students.

This finding is attributed with **Mokahal et al. (2021)** who highlighted that the learning styles and approaches can influence students' educational outcomes and achievement. Also, the finding is supported by the finding of **Chetty et al. (2019)** who stated that there was statistically significance correlation between students' academic performances and their learning styles such as visual and haptic it can increase or decrease their success level.

While, this study revealed that there were no statistically significance correlation between students'

academic achievement and the learning styles (auditory). This could be due to not all students benefit from auditory learning style into their learning process and their final results. A number of students may prefer using and teaching through this style but finally not achieve best outcome, and in the other side many students not prefer it but when the teacher using it the students' achievement is improved.

This finding is consistent with **Chetty et al. (2019)** who stated that there was weak relation between students' academic achievement and the auditory learning styles.

While the finding is not consistent with the finding of **Kouhan et al. (2021)** who reported that there was no statistically significant difference was found between any of students' learning styles and students' academic performance.

Conclusion

This research concluded that more than fifty percent of nursing students have a below average self-directed learning, also the majority of them have learner visual style in learning, moreover less than fifty percent of nursing students have very good degree.

Also there were statistically significant relations between nursing students' self-directing learning and all personal data except their age. Moreover there were no statistically significant relations between nursing students' visual style of learning and their personal data. While, there were no statistically significant relations between nursing students' auditory style of learning and personal data except academic year.

In addition, there were no statistically significant relations between nursing students' haptic style of learning and all personal data except their age Also that no statistically significant relations between nursing students' academic achievement and their personal data. Finally there were positive correlations between the study variables except between auditory learning style and academic achievement

Recommendations

The following recommendations were inferred from the study:

1. Develop the strategies to promote SDL by the Faculty.
2. Students need to continuously assess opportunities for readiness for SDL. Assess Self Directed Learning Readiness continuously.
3. Incorporate SDL as a teaching strategy and it may be imparted in teachers training programs and curricula for teachers to improve the teaching learning process.
4. Introduce SDL strategies to students before the start of their academic sessions at higher education level as students must be able to regulate their studies and academic activities.
5. Conduct research to assess and assist their students in identifying and learning through their own style preferences.
6. Conduct research to explore factors affect on SDL as well as their academic achievement among nursing students.

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