

LEARNING STYLES PREFERENCE OF UNDERGRADUATE NURSING STUDENTS IN KHYBER PAKHTUNKHWA: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Every individual possesses a unique learning style. Research has shown that learners often prefer specific techniques, termed as learning styles, which significantly influence their academic performance. This study aims to identify Nursing students preferred learning styles (visual, auditory or tactile).

Material and Methods: A cross-sectional Descriptive quantitative study was conducted on students enrolled in Bachelor of Science in Nursing who had qualified at least one semester of their study, at Institute of Nursing Sciences, Khyber Pakhtunkhwa, Pakistan. Recruitment was done from each semester on convenience base. The study sample comprised on 211 participants. Duration of study was December 2023 to May 2024. A validated “learning style questionnaire also known as the Barsch Inventory of Learning Preferences” consist of three learning preferences visual, auditory and tactile was utilized for data collection. Data were analyzed using statistical package for social sciences (SPSS) 27.0. where categorical data were expressed as frequency and percentage.

Results: The study sample include 109 females and 102 males. Participants exhibited diverse preferences for learning styles, categorized as Visual Prefer Score: 105 participants (49.8%) Auditory Prefer Score: 52 participants (24.6%), Tactile Prefer Score: 27 participants (12.8%). Additionally Fewer participants preferred a combination of learning styles. The results revealed that majority of students preferred visual learning style followed by auditory and tactile learning style.

Conclusion: The findings of this study reveal preference for visual learning styles among undergraduate nursing students. The nursing education programs should consider incorporating a variety of instructional methods, with a stronger emphasis on preferred learning style of students. By catering to these diverse learning styles, educators can enhance engagement and improve educational outcomes, ensuring that students' learning needs are effectively met.

Keywords: Auditory learners; Learning styles; Nursing; Tactile learners; Undergraduate nursing students; Visual learners..

INTRODUCTION

The term "learning style" refers to the approach or process, understanding, and retaining information by which a learner's knowledge and skills are enhanced; it is a distinct and habitual pattern of acquiring knowledge, skills, and attitudes through study and practice. A learning style refers to an individual's method of making sense of new material, commonly done through sight, touch, and sound [1].

Nowadays, numerous learning approaches are used in nursing colleges and universities. Interactive lectures, focus group discussions, audio visuals, demonstrations, and tutorials are examples of these approaches. With the expansion of knowledge and technology, new concepts and topics emerge [2]. It includes interactive lectures, discussions, group work, case studies, simulations, multimedia presentations, or experiential learning activities.

Understanding different learning styles has become a critical subject of research in the modern educational setting, especially in the field of nursing education. The nursing profession is changing to suit the ever-changing demands of healthcare, and education is playing a more and more important role in training qualified nurses. Since it is now known that students have a variety of cognitive preferences and learning styles, teachers have focused on developing instructional strategies that take these individual variances into consideration. Carl Jung first put up the idea of learning styles in the early 20th century, and during the second half of the century, educational psychology gave it a lot of attention. Scholars like David Kolb, Neil Fleming, and Howard Gardner built on the work of Carl Jung by putting forth a variety of models and frameworks to classify and examine individual learning preferences. This helped to deepen our understanding of learning styles [3].

Objectives

1. To determine nursing students' learning styles preference.

Significance of the Study

Numerous research highlights the significance of learning styles. Since most students are unaware of their preferred methods of learning, it is unlikely that

they will begin experimenting with different approaches to learning. This study supports the idea that it's important to identify students preferred styles of learning [4].

The significance of this study is to reveal the preferred learning of nursing students, provide a guide for improving the Nursing education system to teach the student in an Auditory, visual, and tactile manner for a better outcome and by identifying students' learning styles, educators can modify teaching methods to match individual preferences, promoting effective learning and better outcomes.

MATERIAL AND METHODOLOGY

The cross-sectional descriptive Quantitative research design employed in this study to determine the preferred learning styles. The population of interest for this study comprises nursing students enrolled in Bachelor of Science in Nursing (BSN), at Institute of Nursing Sciences (INS-KMU), Pakistan during 2024. A convenience sampling technique was used for selecting a sample of nursing students from different semesters of the institution.

The sample size was determined using appropriate statistical formulas by Open-Epi, considering the chosen 95% confidence level. The initial calculation determined a sample size of 197 participants along with 10 % attrition rate. Ultimately, the final sample size obtained from data collection was 211 participants. Undergraduate Nursing students who had qualified at least one semester of their study, 2nd semester and onward were Included and Absent students, result awaited or not promoted students, and those who are not available at the time of data collection due to filed visits or research activities and Students not willing to participate in the study were excluded.

The data collection process was started by getting approval from ethical committee of institution with reference number (Re: 465-AAA-ERC-AFPGMI) and relevant authorities. A validated "learning style questionnaire was utilize also known as the Barsch Inventory of Learning Preferences (BILP)" consist of three learning preferences visual, auditory and tactile (Barsch, 1996). The questionnaire was translated in Urdu while keeping the original

statements in English, and validated in 2015 by a PhD scholar, reliability coefficient was found to be 0.81 (Khan, S.A. 2015). The questionnaire is a 24 items five-points Likert scale. Each category consists of eight questions with three options i.e., Seldom = 1 point, sometimes= 3 points and often =

5 points. The Questionnaire was filled in the researcher's presence. It was collected after completion. The data analysis was conducted utilizing the registered version of SPSS v.27, a statistical software package widely employed for analyzing quantitative data in research studies.

RESULTS

Table 1: Demographic characteristics of Participants

Demographic Variables	Categories	Frequency	Percent
Age Group	20 & below	54	25.6%
	21 – 24	146	69.2%
	25 & above	11	5.2%
Gender	Male	102	48.3%
	Female	109	51.7%
Marital Status	Married	20	9.47%
	Single	191	90.52%
Language	Urdu	18	8.5%
	Pushto	181	85.8%
	Chitrali	7	3.3%
	Saraiki	4	1.9%
	Balochi	1	0.5%
Semester	3 rd	62	29.4%
	5 th	61	28.9%
	7 th	88	41.7%

A sample size of 197 along with ten percent of attrition rate (n = 211) nursing students were included in the study. All questionnaires were completed with a response rate of 97.23%. The socio-demographic characteristics of study (Table-1) show that Participants between the ages of 21 and 24 made up 146% of the sample as a whole. Participants who were 20 years made up 25.6% of the sample. Conversely, participants of age 25 and above comprising only 5.2% of the total sample. The participants in the study were almost evenly split between male and female, with females comprising 51.7% (109 participants) and males comprising

48.3% (102 participants) of the total sample in which 191 participants (95%) were single and 20 participants (9.5%), were married. The majority of participants, 181 (85.8%), spoken language was Pushto, while other languages represented in the study included Balochi (0.5%), Saraiki (1.9%), Chitrali (3.3%), and Urdu (8.5%). The study's participants were split up over three academic semesters in the following ways: There were 62 participants in the third semester, 61 participants in the fifth semester, and 88 participants in the seventh semester.

Participants Responses to Learning Style Questions

Table 2: Participants Responses to Learning Style Questions of Visual Domain.

S. No.	Q#) Questions	P. Responses	Frequency	Percent%
1	2) I follow written directions better than oral directions.	Seldom	20	9.5%
		Sometimes	61	28.9%
		Often	130	61.6%
2	3) I like to write things down or take notes for visual review.	Seldom	36	17.1%
		Sometimes	31	14.7%
		Often	144	68.2%
3	7) I am skillful and enjoy developing and making graphs and charts	Seldom	77	36.5%
		Sometimes	72	34.1%
		Often	62	29.4%
4	10) I can understand and follow directions using maps	Seldom	34	16.1%
		Sometimes	69	32.7%
		Often	108	51.2%
5	14) I can better understand a news article by reading about it in the paper than by listening to the radio.	Seldom	68	32.2%
		Sometimes	66	31.3%
		Often	77	36.5%
6	16) I feel the best way to remember is to picture it in my head	Seldom	12	5.7%
		Sometimes	26	12.3%
		Often	173	82.0%
7	20) I grip objects in my hands during learning period	Seldom	71	33.6%
		Sometimes	69	32.7%
		Often	71	33.6%
8	22) I obtain information on an interesting subject by reading relevant materials	Seldom	24	11.4%
		Sometimes	51	24.2%
		Often	136	64.5%

The table 2 reveals the participant's responses to Visual Learning Style questions. The questions have three possible responses i.e. Often, Seldom and Sometimes having Likert Scale Score 1, 3, and 5 respectively. The table shows the frequencies and percentages of participant's responses in which The majority 173 participant's (82%) responded as *Often* to question 16 that is (I feel the best way to remember is to picture it in my head).77 participants

(36.5%) responds *Seldom* to question 7(I am skillful and enjoy developing and making graphs and charts) .144 participant (68.2%) respond *Often* to question 3 (I like to write things down or take notes for visual review), and 71 participants respond *Seldom* to Question 20 (I grip objects in my hands during learning period). Similarly, 136 participant (64.5%) respond *Often* to question 22(I obtain information on an interesting subject by reading relevant materials).

Table 3: Participants Responses to Learning Style Questions of Auditory Domain.

S. No.	Q#) Questions	P. Responses	Frequency	Percent%
1	1) I can remember more about a subject through listening than reading.	Seldom	42	19.9%
		Sometimes	83	39.3%
		Often	86	40.8%
2	5) I require explanations of diagrams, graphs or visual directions.	Seldom	41	19.4%
		Sometimes	87	41.2%
		Often	83	39.3%
3	8) I can tell if sounds match when presented with pairs of sounds.	Seldom	47	22.3%
		Sometimes	81	38.4%
		Often	83	39.3%
4	11) I do better at academic subjects by listening to lectures and tapes	Seldom	32	15.2%
		Sometimes	66	31.3%
		Often	113	53.6%
5	13) I learn to spell better by repeating the letters out loud than by writing the word on paper.	Seldom	83	39.3%
		Sometimes	71	33.6%
		Often	57	27.0%
6	18) would rather listen to a good lecture or speech than read about the same material in a textbook	Seldom	49	23.2%
		Sometimes	65	30.8%
		Often	97	46.0%
7	21) I prefer listening to the news on the radio rather than reading about it in a newspaper	Seldom	67	31.8%
		Sometimes	66	31.3%
		Often	78	37.0%
8	24) I follow oral directions better than written ones	Seldom	55	26.1%
		Sometimes	75	35.5%
		Often	81	38.4%

Table 3 reveals the participant's responses to Auditory Learning Style questions. The highest number of participant's response to question 11(I do better at academic subjects by listening to lectures and tapes) as *Often* that is 113 participant or 53.6% and *Seldom* response to question 13(I learn to spell better by repeating the letters out loud than by writing the word on paper) that is 83 participant (39.3%). 97 participant (46.2%) respond *Often* to

question 18 (I would rather listen to a good lecture or speech than read about the same material in a textbook) and 67 participants respond *Seldom* to Question 21(I prefer listening to the news on the radio rather than reading about it in a newspaper). Similarly, 86 participants (40.8%) respond *Often* to question 01(I can remember more about a subject through listening than reading).

Table 4: Participants Responses to Learning Style Questions of Tactile Domain.

S. No.	Q#) Questions	P. Responses	Frequency	Percent%
1	4) I bear down extremely hard with pen or pencil when writing.	Seldom	86	40.8%
		Sometimes	47	22.3%
		Often	78	37.0%
2	6) I enjoy working with tools	Seldom	20	9.5%
		Sometimes	34	16.1%
		Often	157	74.4%
3	9) I remember best by writing things down several times	Seldom	26	12.3%
		Sometimes	52	24.6%
		Often	133	63.0%
4	12) I play with coins and keys in pockets.	Seldom	128	60.7%
		Sometimes	48	22.7%
		Often	35	16.6%
5	15) I chew gum or snack during studies.	Seldom	127	60.2%
		Sometimes	48	22.7%
		Often	36	17.1%
6	17) I learn spelling by "finger spelling" the words	Seldom	135	64.0%
		Sometimes	50	23.7%
		Often	26	12.3%
7	19) I am good at working and solving jigsaw puzzles and mazes.	Seldom	97	46.0%
		Sometimes	64	30.3%
		Often	50	23.7%
8	23) I feel very comfortable touching others, hugging, handshaking, etc.	Seldom	74	35.1%
		Sometimes	73	34.6%
		Often	64	30.3%

Table 4 presents the frequency and percentage distribution of participants' responses to Tactile Learning Style questions, measured using a Likert scale with three options: *Often* (score 5), *Sometimes* (score 3), and *Seldom* (score 1). The highest number of participant's response to question 6 as *Often* that is 157 participant or 74% and *Seldom* response to

question 15 that is 135 participant or 64%. 133 participant or 63% respond *Often* to question 9 and 128 participants respond *Seldom* to Question 12. Similarly, 78 participants or 37% respond *Often* to question 4. Overall Cronbach alpha for visual, auditory and tactile were 0.77.

Overall Learning Styles Preference Score

Table 5: Distribution of Participants by Learning Styles Preference Score

Learning Style Preference	Frequency	Percent
Visual Prefer Score	105	49.8%
Auditory Prefer Score	52	24.6%
Tactile Prefer Score	27	12.8%
Visual & Auditory Prefer Score	17	8.1%
Visual & Tactile Prefer Score	7	3.3%
Auditory & Tactile Prefer Score	2	0.9%
Visual, Auditory & Tactile Prefer Score	1	0.5%
Total	211	100.0

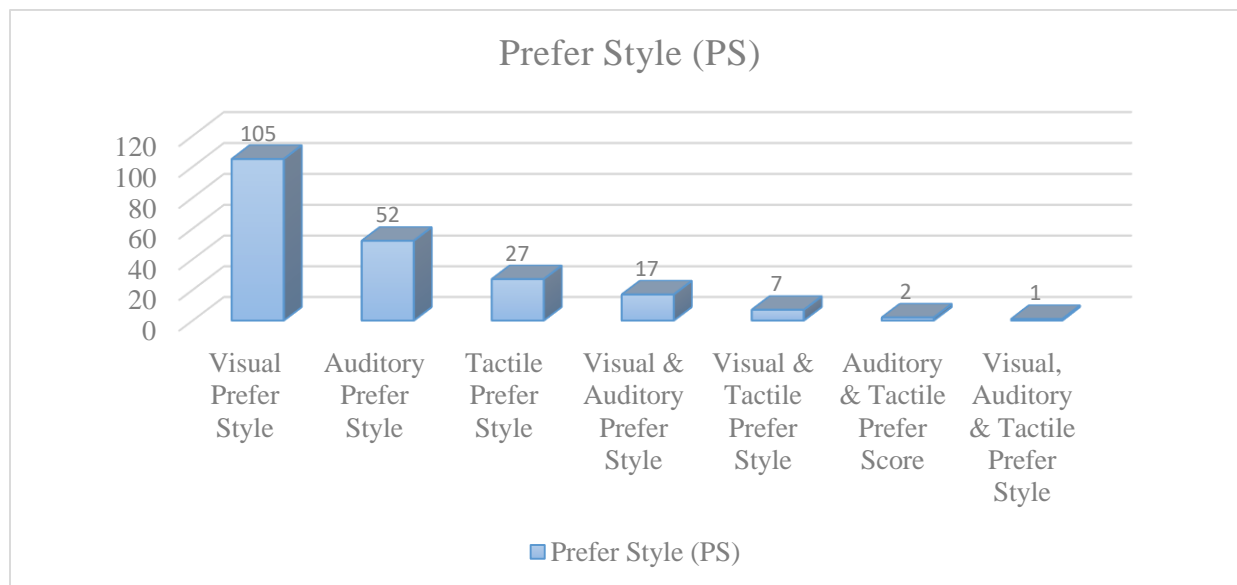


Figure 5: Distribution of Participants by Learning Styles Preference

Among two hundred and eleven ($n = 211$) nursing students' majority of participants, 105 (49.8%), exhibited a preference for visual learning. 52 participants (24.6%) chose auditory learning approaches, A sizeable percentage of the sample consisted of auditory learners, who favor speaking and listening as their primary modes of instruction. 27 (12.8%) participants preferred tactile learning styles. A smaller but important portion of learners were tactile, or hands-on, in their preferences for activities and experiences. Additionally Fewer participants preferred a combination of learning styles. Visual, Auditory & Tactile Prefer Score: 1 participant (0.5%) Visual & Auditory Prefer Score: 17 participants (8.1%) Visual & Tactile Prefer Score: 7 participants (3.3%) and Auditory & Tactile Prefer Score: 2 participants (0.9%) as shown in figure 2.

These preferences indicate a predominant inclination towards visual learning styles, followed by auditory and tactile preferences, with some participants showing preferences for multiple learning styles.

DISCUSSION

This study aim is to identify the Preferred Learning Styles of Undergraduate Nursing Students. It 1s involved 211 participants with a nearly equal gender distribution (48.3% males and 51.7% females), representing a balanced sample reflective of many

contemporary educational studies [6]. This gender distribution is also consistent with previous studies examining learning styles and academic achievement in similar populations. The age distribution, with 46.9% of participants aged between 23 and 25 years, aligns with the typical demographic focus of research on undergraduate students. Demographic variables including age and gender can affect educational experiences and learning results [7]. The study's gender distribution aligns with previous research that has examined gender variations in learning preferences. Studies carried out in academic settings, where the focus is frequently on young adult learners, typically have this demographic profile. Interpreting the influence of learning styles on academic performance requires a balanced understanding of learning preferences across early adult stages, which is provided by the representation of diverse age groups [8].

Learning Styles Preferences

Participants in the proposed study demonstrated a strong preference for visual learning styles (49.8%), followed by auditory (24.6%) and tactile (12.8%) preferences. This predominance of visual learning aligns with recent studies that highlight the effectiveness of visual aids in educational settings. Visual learning styles have been shown to enhance comprehension and retention, particularly in contexts where visual information is prevalent [9].

This preference for visual learning is consistent with prior studies, such as those by Fleming, 2001, which have also identified visual learning as the most common style among nursing students. The study's findings, which show a more balanced distribution of learning styles, are in contrast to Brown and Lee's 2023 findings, which indicate a decreased preference for tactile learning. This disparity could be explained by variances in the nursing education system's methodology or by disparities in the educational environments. Reid, 1987 for instance, points out that learning style preferences can be influenced by cultural and environmental influences. This implies that different educational contexts with varying resource availability may produce different outcomes. small percentage of participants who preferred a combination of learning styles (8.1%) supports the notion that multimodal learning approaches can be beneficial. Recent research by Moreno and Mayer (2022) highlights the advantages of integrating multiple learning modalities to address diverse learner needs. Multimodal learning strategies have been found to enhance engagement and understanding by catering to different sensory preferences [10].

Similarly, McAllister [11] found that nursing students in the United States preferred hands-on practice (Tactile learning) and activities like reading and writing, with visual learning being a close second. This kind of active learning is effective for building practical skills that nursing students need. In another study, Mohamed and Elwogoud [12] reported that tactile learning was the most common among technical nursing students in Alexandria, where practice greatly improved their learning.

On the other hand, Alharbi et al. [13] found that Auditory learning was the least popular among their participants, who felt that lectures were not very helpful. Additionally, Parul and Vikas [14] explored the learning styles of nursing students and reported that, active learning (specifically tactile learning) was the least liked among their participants. This apparent contradiction raises interesting questions about the varying preferences among different student populations. The differences in findings between their study and the current research may be attributed to several factors, including the specific demographic and educational backgrounds of the students surveyed. This research focuses

particularly on undergraduate nursing students, whose needs and preferences may differ significantly from those in other nursing programs or levels of study.

Conclusion

In conclusion, seven (7) variations in the learning styles preference were identified. Consequently, there was a predominant learning style, majority of the study sample preferred visual learning style, like using pictures, charts, and videos. The study also found that some students prefer auditory learning, which involves listening, and tactile learning, which includes hands-on activities. The nursing education programs should consider incorporating a variety of instructional methods, with a stronger emphasis on preferred learning style of students. By catering to these diverse learning styles, educators can enhance engagement and improve educational outcomes, ensuring that students' learning needs are effectively met.

Recommendations:

In the educational context nursing educator should emphasize the use of visual modalities such as pictorial modalities, illustrations to facilitate learning process in nursing students. In addition, student should be encouraged to take active participation such as clinical skills and practices to acquire knowledge. Furthermore, the type of information should be presented in a sensory form such as sound and sights to improve learning skills. However, further research is warranted in nursing education to identify whether matching of student learning preferences and educator learning styles is more or less effective in improving teaching learning strategies and learning skills.

Limitations: The study may limit the generalizability of the results to larger nursing educational institutions. the use of self-reported questionnaires for evaluating learning styles may introduce subjective bias, as students may overestimate their capabilities. Additionally, it focuses only on one factor the preferred learning styles of the students. This means other important aspects such as academic success, teaching methods, study habits, and external factors (like stress or support systems), were not taken into account. As a

result, the study may not provide a complete picture of what affects the students' learning outcomes.

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