

## ORIGINAL ARTICLE

# PREFERENCES FOR VISUAL, AUDITORY AND KINESTHETIC LEARNING STYLES AMONG NURSING STUDENTS OF LAHORE, PAKISTAN

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## ABSTRACT

**Background:** Different students have different preferences for visual, auditory and kinesthetic learning styles. The objective of this study was to determine the preferences for visual, auditory and kinesthetic learning styles among nursing students of Lahore, Pakistan.

**Materials & Methods:** This cross-sectional study was carried in Lahore School of Nursing, University of Lahore, Pakistan from March 11 to June 10, 2022. We adapted our questionnaire from Barsch Learning Styles Inventory for 113 BSN students. Learning styles, gender, age groups and academic year were categorical variables and were analyzed as counts and percentages with 95%CI.

**Results:** Total 113 students were included, 17 males (15.04%) and 96 (84.96%) females, with 101 (89.38%) in 20-24 years and 45 (39.82%) in 2<sup>nd</sup> and 68 (60.18%) in 3<sup>rd</sup> academic year. Visual learning style was moderately preferred by 67 (59.30%), followed by highly preferred by 40 (35.40%) and less preferred by six (5.30%) students. Auditory learning style was moderately preferred by 88 (77.88%), followed by highly preferred by 23 (20.35%) and less preferred by two (1.77%) students. Kinesthetic learning style was moderately preferred by 71 (62.84%), followed equally by highly preferred and less preferred by 21 (18.58%) students.

**Conclusion:** Visual learning style was moderately preferred by maximum students, followed by highly preferred and less preferred. Auditory learning style was moderately preferred by maximum students, followed by highly preferred and less preferred. Kinesthetic learning style was moderately preferred by maximum students, followed equally by highly preferred and less preferred.

**KEY WORDS:** Learning Style; Nursing; Students; Questionnaire.

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## 1. INTRODUCTION

**1.1 Background:** Learning method of an individual is described as the complex feature of their cognitive, affective and psychomotor characteristic through which learners perceive, interpret and respond to educational stimuli.<sup>1</sup> Students have exclusive patterns of gaining knowledge and these patterns can affect the brilliance of the learning and exploring new

things. The multi-model VAK is an abbreviation for visual, auditory, and kinesthetic.<sup>2</sup>

Academic status of students is one of the most common parameter used to predict the financial stability of learner. The learning pattern is described as a mixture of cognitive, affective, and psychomotor developments which display the interaction of learner to the educational environment.<sup>3</sup> The characteristics of university students vary in terms of age, cultural background, level of maturity, intelligence capability and psychological patterns of perceiving or interpreting things.<sup>4</sup> Medical science learners like nursing students use unique and efficient approaches to obtain and retain knowledge.<sup>5</sup>

The learning of nursing students is affected by environmental factors and issues in curriculum, as well as teaching methods.<sup>6</sup> Learning preference may be a difficult approach during which the learner ought

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to save, recall and process the ideas with effectively.<sup>7</sup> Every student has own learning approach and technique. There are various approaches and scales to measure the preferred learning styles among nursing students.<sup>8</sup> It is critical to adapt new teaching and learning approaches to varied degrees.<sup>9</sup> Instructors can modify pedagogy to meet a student's learning style, which is favorable to prospective learning capacities, which has been widely regarded to benefit both teachers and pupils.<sup>10</sup> Being aware of the unique learning styles, can assist students in determining the best ways to study and benefit from them in their future career.<sup>11</sup>

Barsch in 1996 developed VAK multi model of learning, and designed multi-model VAK questionnaire. This questionnaire is the most commonly used questionnaire worldwide to assess the preferred learning style in learners.<sup>12</sup> According to this questionnaire, there are 3 learning components; visual (V) learning style, auditory (A) leaning style, and kinesthetic (K) learning style. (Table 1)

**Table 1: Description of learning styles (Barsch, 1996)**

Learning Style	Description
Visual learners	Like written words or visual representations of concepts, enjoy pictures, maps, charts, etc. Overhead transparencies, handouts, charts, diagrams, and board work are all helpful to visual learners. <sup>12</sup>
Auditory learners	Utilize voices and ears as the main learning tools, using words to communicate. Discussion in class is a favorite activity for auditory learners, who are less likely to take notes. <sup>12</sup>
Kinesthetic learners	Are physically engaged in their studies, desire to work with materials, produce goods, complete projects, etc. The greatest way to learn is to experiment, try new things, and practice. <sup>12</sup>

In modern era, students are more concerned with academic achievement than learning. Student's obsession for grades is many times higher than urge to learn.<sup>13</sup> The VAK questionnaire will stimulate the cognition about the learning styles. This research will have a significant end over in promoting visual, auditory, and kinesthetic (VAK) learning styles. Multiple studies have been conducted on VAK learning styles but there is not sufficient work done in the field of nursing on this topic.

The research divides learners into three groups based on individual differences; visual, auditory and kinesthetic learners. It also addresses the key

features of each type of learner, as well as the tactics required for effective and productive learning in light of their requirements. The research underscores the fact that no two people learn in the same way. Each has a distinguishing trait that dominates and directs their learning styles, distinguishing them from others on the one hand and disclosing the method and medium required by teachers to enable them to practice in a productive and systematic manner on the other. During teaching and learning, a mix of talents and tactics must be kept in mind in order to attain the stated aims.<sup>14</sup>

**1.2 Research question:** What are the preferences for visual, auditory and kinesthetic learning styles among nursing students of Lahore, Pakistan?

**1.3 Research Objective:** To determine the preferences for visual, auditory and kinesthetic learning styles among nursing students of Lahore, Pakistan.

**1.4 Significance:** The findings of this study will help the educational organizations to develop strategies for enhancing self-directed learning abilities among nursing students centered curriculum. This action may motivate the nursing students towards preferred learning style.

## **2. MATERIAL AND METHODS**

**2.1 Design, setting, duration and ethical consideration:** This cross-sectional study was carried in Lahore School of Nursing, Faculty of Allied Health & Sciences, University of Lahore, Lahore, Pakistan from March 11, 2022 to June 10, 2022. The rights of the research participants were respected. All participants were provided written informed consent. All data gathered on questionnaire was kept confidential. Ethical approval was granted by the University Ethical Committee.

**2.2 Population, sample size, technique and selection:** In Lahore, there are 16 nursing schools, with approximate population of 2,492 BSN students; our population. New comers of first year and outgoing fourth year students counting to 517 were excluded. Thus our population of interest included 1,975 (2,492-517=1,975) students in second and third academic years. With population count of 1,975, 90% response distribution, 95% confidence level and 4.45% margin of error, sample size of 110 was calculated by an online calculator.<sup>15</sup> All those who were absent or who did not consent were excluded.

By convenience sampling, we selected our school; Lahore School of Nursing with 136 eligible students. Out of these, nine were unavailable at the time of data collection and five were unwilling to participate. Questionnaires were distributed to the rest of 122 students. The response was received from 113 (92.62%) students. Hence, 113 nursing students made up our sample.

**2.3 Conduct of procedure:** The questionnaires were

personally distributed to participants at the Lahore School of Nursing by the researchers themselves. Following a 30-minute timeframe for returning the questionnaire, then these were collected on-site.

**2.4 Data collection tool:** We adapted our questionnaire from Barsch Learning Styles Inventory.<sup>12</sup> Khan, et al. have used it in their study conducted in Punjab, Pakistan.<sup>16</sup> This inventory has eight items each for visual, auditory and kinesthetic learning styles. We selected six items for visual, six for auditory and five for kinesthetic learning styles as per our context. We analyzed this inventory through 5-points Likert scale, rather than recommended by Barsch. The responses were given scores as numerical values; 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree and 5 for strongly agree. These numerical scores were subjected to data matrix; the scores for six items for visual and auditory learning styles each were added and then divided by six (number of items). For kinesthetic style, the scores for five items were added and divided by five. This way we got mean score for each participant. As we will measure our preferences on ordinal scale, so these scores of 1-5 with percentages for each participant were categorized into three attributes as highly, moderately and less preferred. (Table 2)

**2.5 Data collection and analysis plan:** Preference for visual, auditory and kinesthetic learning styles was our research variable on ordinal scale. Sex

(males and females) on nominal, age groups (15-19, 20-24, & 25-29 years) on ordinal, and academic year (2<sup>nd</sup> and 3<sup>rd</sup> year) on nominal scale were our three demographic variables. All variables being categorical were calculated as counts and percentages for the sample. A 95% confidence interval was calculated for the population using Wilson score interval through an online calculator “Statistics Kingdome” (<https://www.statskingdom.com/proportion-confidence-interval-calculator.html>).

### 3. RESULTS

**3.1 Demographics:** The sample of 113 students included 17 males (15.04%) and 96 (84.96%) females. There were seven (6.20%) students in age group 15-19 years, 101 (89.38%) in 20-24 and five (4.42%) in 25-29 years. There were 45 (39.82%) students in 2<sup>nd</sup> year and 68 (60.18%) in 3<sup>rd</sup> academic year.

**3.2 Preference for visual learning style:** Visual learning style (VLS) was moderately preferred by 67 (59.30%) students, followed by highly preferred by 40 (35.40%) and less preferred by six (5.30%) students. (Table 3.2)

**3.3 Preference for auditory learning style:** Auditory learning style (ALS) was moderately preferred by 88 (77.88%) students, followed by highly preferred by 23 (20.35%) and less preferred by two (1.77%) students. (Table 3.3)

**Table 2: Preferences of learning styles in scores and percentages**

Learning styles	Highly preferred		Moderately preferred		Less preferred	
	Score	%age	Score	%age	Score	%age
Visual Learning	>4.00-5.00	>80-100%	>3.00-4.00	>60-80%	1.00-3.00	20-60%
Auditory Learning	>4.00-5.00	>80-100%	>3.00-4.00	>60-80%	1.00-3.00	20-60%
Kinesthetic Learning	>4.00-5.00	>80-100%	>3.00-4.00	>60-80%	1.00-3.00	20-60%

**Table 3.2: Preferences for visual learning style among nursing students of Lahore, Pakistan (n=113)**

Preferences	Sample statistics		95%CI of proportion	
	Count	Percentage	Lower	Upper
Highly preferred	40	35.40	27.19	44.56
Moderately preferred	67	59.30	50.07	67.89
Less preferred	06	05.30	02.45	11.10
Total	113	100%	Population parameters	

**Table 3.3: Preferences for auditory learning style among nursing students of Lahore, Pakistan (n=113)**

Preferences	Sample statistics		95%CI of proportion	
	Count	Percentage	Lower	Upper
Highly preferred	23	20.35	13.96	28.69
Moderately preferred	88	77.88	69.37	84.54
Less preferred	02	01.77	00.48	06.22
Total	113	100%	Population parameters	

**Table 3.4: Preferences for kinesthetic learning style among nursing students of Lahore, Pakistan (n=113)**

Preferences	Sample statistics		95%CI of proportion	
	Count	Percentage	Lower	Upper
Highly preferred	21	18.58	12.48	26.74
Moderately preferred	71	62.84	53.63	71.18
Less preferred	21	18.58	12.48	26.74
Total	113	100%	Population parameters	

**3.4 Preference for kinesthetic learning style:**

Kinesthetic learning style (KLS) was moderately preferred by 71 (62.84%) students, followed equally by highly preferred by 21 (18.58%) and less preferred by 21 (18.58%) students. (Table 3.4)

**4. DISCUSSION**

The learning style is a generally stable personal attribute that develops over a long period of time and is influenced by a variety of variables, including demographic qualities, internal personality traits, and external teaching situations. As the influencing factors alter constantly, the learning style can also be altered.<sup>17</sup> Every student mixes several learning strategies in a way that suits him/her best and that he/she develops through time. When learning or carrying out other duties, a person is more likely to rely on any one of these categories.<sup>18</sup>

In our study, visual learning style (VLS) was moderately preferred by 67 (59.30%) students, followed by highly preferred by 40 (35.40%) and less preferred by six (5.30%) students. Auditory learning style (ALS) was moderately preferred by 88 (77.88%) students, followed by highly preferred by 23 (20.35%) and less preferred by two (1.77%) students. Kinesthetic learning style (KLS) was moderately preferred by 71 (62.84%) students, followed equally by highly preferred by 21 (18.58%) and less preferred by 21 (18.58%) students.

Similar results were reported by Khan, et al.<sup>16</sup> from Rawalpindi, Pakistan from a sample of 1200 BA/ BSc and BS students from 12 public sector colleges of Punjab province in 2019 using Barsch Learning Preferences Inventory (BLPI). In this study, maximum students 52.9% preferred visual learning style, followed by auditory 17.6% and kinesthetic 8.5%.

Similar results are reported in 2016 by Ibrahim & Hussein<sup>19</sup> on 210 undergraduate students of two Nursing Colleges from Mosul and Kirkuk, Iraq. They used VAK learning style questionnaire. The result of our study showed that visual learning style was preferred by 40%, followed by auditory in 29.5% and

kinesthetic in 30.5% students.

H-rui, et al.<sup>11</sup> reported in 2018 from Hunan, China 159 nursing students pursuing bachelor’s degrees and 199 nursing students pursuing associate degree. They used version 7.0 of VARK questionnaire developed by Fleming. The kinesthetic learning style was predominant in bachelor students as 18.20% and in associate degree students as 33.68%, while read/write was least popular style in bachelor students as 2.5% and in associate degree students as 4.02%.

Baykan and Nacar<sup>20</sup> determined preferred mode of learning of first-year medical students of Erciyes University from Kayseri, Turkey in February 2006. The findings showed that 23.3% preferred kinesthetic learning, 7.7% preferred auditory, 3.2% visual and 1.9% read/write learning.

Cheng and Wongs<sup>21</sup> in 2014 measured learning styles of 17 undergraduate students by the Index of Learning Styles (ILS) in Hong Kong, China, revealing the most preferred learning style as visual learning (82.4%).

Daoruang, et al.<sup>5</sup> revealed that the most preferred learning style was kinesthetic learning in 47 undergraduates in second semester of academic year 2018. The study concluded that teaching/learning methods do not have equal achievement for the different groups of learning styles.

Numerous potential limitations could have affected our study’s findings. The study was conducted at a single university. The statistical findings were not likely to be the result of chance, but this did not imply that they were legitimate or applicable to situations outside of this university. According to this study, nursing students like to learn by seeing, hence nursing educators should use visual-read/write aids in their teaching method. To learn more and perform better, students should be given demonstrations, hands-on activities, and experiments in practical areas including nursing skills and evidence-based practices. Given that the

study was quantitative, qualitative methods may be combined with quantitative methods to increase the validity of the findings.

## 5. CONCLUSION

In our study, visual learning style was moderately preferred by maximum students, followed by highly preferred and less preferred. Auditory learning style was moderately preferred by maximum students, followed by highly preferred and less preferred. Kinesthetic learning style was moderately preferred by maximum students, followed equally by highly preferred and less preferred.

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Conception or Design:	SH, AA
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All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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