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RESEARCH ARTICLE
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IDENTIFY THE LEARNING STYLE PREFERENCE BY USING VARK (VISUAL, AUDITORY, READ, WRITE & KINESTHETICS) MODEL AMONG FIRST YEAR B.SC. NURSING STUDENTS AT SELECTED COLLEGE.

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Abstract:
Background: Understanding students' learning preferences is critical in nursing education to enhance teaching efficacy and academic performance. The VARK model (Visual, Auditory, Read/Write, and Kinaesthetic) offers a framework to identify individual learning styles and guide instructional strategies accordingly**.**
Objective: To identify the learning preference among nursing students and to determine the association between learning preferences with sociodemographic variables.
Materials and Methods: A facility-based, analytical cross-sectional study was conducted among 345 first-year B.Sc. Nursing students from five randomly selected nursing colleges in Lucknow. A pretested, interviewer-administered, semi-structured questionnaire, including the VARK inventory, was used to collect data. Sociodemographic variables and learning preferences were analyzed using SPSS version 22.0. Associations were tested using the chi-square test, with $p < 0.05$ considered statistically significant.
Results: Unimodal learning preferences dominated across all learning scenarios, with Read/Write and Kinesthetic styles being the most common. Multimodal learners constituted a small proportion, ranging from 2.0% to 8.1% across different learning contexts. A significant association was found between learning style preferences and residential background ($p = 0.04$), family educational status ($p = 0.000$), and internet accessibility ($p = 0.000$). No significant association was observed with gender ($p = 0.19$).

Conclusion: The predominance of unimodal learning preferences among nursing students underscores the importance of customizing teaching methods to match learner profiles. Socio-environmental factors significantly influence learning preferences, emphasizing the need for inclusive, adaptable, and student-centered pedagogy in nursing education.

Keywords: VARK model, learning style, nursing students,

Introduction:

Clinical competence is a complex and intricate notion that has been thoroughly investigated from several viewpoints in recent years.[1] The World Health Organization (WHO) emphasizes the need of evaluating and improving nurses' competence as essential principles for maintaining service quality. The WHO defines nurses as competent when they can adequately complete their professional obligations at the requisite level, grade, and standard. The significance of clinical competence in nursing and related fields has been amplified by factors including the evolution of healthcare systems, the necessity for safe and economical services, increased community awareness of health issues, rising expectations for quality care, and the demand for proficient healthcare professionals.[2] Clinical competence is regarded as the paramount goal and standard for evaluating the efficacy of nursing education.

Understanding the students learning preferences plays a crucial role in developing effective teaching strategies in nursing education. Learning style theories offer valuable insights into how individuals absorb, process and retain information. Among these, the VARK model which was developed by Neil Fleming categories the learners into four primary types namely, Visual (V), Auditory (A), Read/Write (R) and Kinaesthetic (K) providing a pragmatic approach for educators to tailor instruction based on individual needs.[3]

In nursing education, where the theoretical understanding and practical application are equally important. Identification of learning styles for the students plays an important role. Previous researches have shown that students were preferring multimodal learning preferences with kinaesthetic and visual modalities being dominant.[4] There was a dearth of research related to learning style preferences hence, this study was planned to assess the learning style preferences and to determine the relationship between the learning mode with sociodemographic profile of the nursing students.

Objectives:

- To identify the mode of learning and learning style preferences among first-year B.sc Nursing students using the VARK questionnaire.
- To analyse the distribution of learning styles and determine the proportion of unimodal vs. multimodal learners.
- To determine the relationship between learning style preferences and socio demographic profile

Materials and Methods

Study design and setting: This facility based cross-sectional study was conducted in the various colleges in Lucknow. Lucknow is the largest city in northern India, capital of Uttar Pradesh. There are about 108 colleges in the Lucknow district. [5]

Study participants, sampling technique, and sample size: This study was conducted among nursing students studying in the selected colleges of Lucknow district. The sample size was calculated by considering 34% (auditory style of learning preference among student) preference of learning method and the absolute precision (d) as 5% at a 95% confidence level.[6] By using Epi tool software,[7] the sample size was calculated to be 345. Cluster random sampling method was applied to select the colleges and from the Participants were recruited through simple random sampling using chit method among the selected clusters. Participants who were not willing to participate, those who were not able to conduct in three consecutive visits and those with learning disablities were excluded from the study

Data collection tool and technique: The study was started after obtaining the necessary permission from the institutional research and ethical committee (Serial Number: IEC/IIMSR/2025/61). All interviews were done face to face by a trained interviewer. The study was conducted after getting informed written consent from the participants in privacy without any family members accompanying them. We used a pretested, semi structured questionnaire which consisted of the sociodemographic details of the participants and VARK questionnaire. Data were compiled, entered in Microsoft Excel software, and analysed using SPSS Version 20 (SPSS Inc, Chicago IL, USA). All the categorical variables were presented as frequencies and percentages, and test of significance like the Chi square

test was used to assess the level of significance of variables. Statistical significance was set at p-value < 0.05.

Operational definitions

Operational definitions:

The **VARK model** is a widely used framework for identifying individual learning style preferences. It was developed by Neil Fleming and classifies learners into four primary categories:

1. **Visual (V):** Learners prefer graphs, charts, diagrams, and spatial representations to understand information.
2. **Auditory (A):** Learners absorb information best through listening to lectures, discussions, or audiobooks.
3. **Read/Write (R):** Learners prefer text-based materials such as reading books, writing notes, or using lists.
4. **Kinesthetic (K):** Learners learn best through hands-on experiences, movement, and practical applications.

Many learners exhibit a multimodal preference, meaning they use a combination of these styles rather than relying on just one.

Results:

A total of 345 first year nursing students participated in the study and the results were described under the following headings:

- Sociodemographic details
- Learning style preferences
- Association between sociodemographic variable and learning style preferences

Sociodemographic details

The majority of the participants were female (64.1%), while males comprised 35.9%. Most students belonged to an urban background (40.6%), followed by rural (33.6%) and semi-urban areas (25.8%). Regarding family structure, 61.7% came from nuclear families and 38.3% from joint families. Nearly half of the participants (47.8%) had parents with an undergraduate-level education, while 33.6% had postgraduate or above, and 18.6% had high school education only. A significant number (91.9%) studied in private institutions prior to entering nursing college. As for commuting methods, 39.1% walked, 23.2% used private vehicles, and 24.9% relied on public transport. **(Table 1)**

Table 1: Demographic details of the study participants:

Demographic variable	**Frequency**	**Percentage**
Gender		
Male	124	35.9
Female	221	64.1
Residential background		
Rural	116	33.6
Semi- Urban	89	25.8
Urban	140	40.6
Type of family		
Joint	132	38.3
Nuclear	213	61.7
Family educational background		

High school	64	18.6
Under graduate	165	47.8
Postgraduate and above	116	33.6
Type of school/college attended prior to Nursing college		
Government	28	8.1
Private	317	91.9
Mode of transportation to college		
Walking	135	39.1
Bicycle	7	2.0
Private vehicle	80	23.2
Public transport	86	24.9
Others	37	10.7

Access to internet regularly

Figure 1 shows that the majority (97.5%) had regular access to the internet, which significantly influenced learning style diversity (p = 0.000).

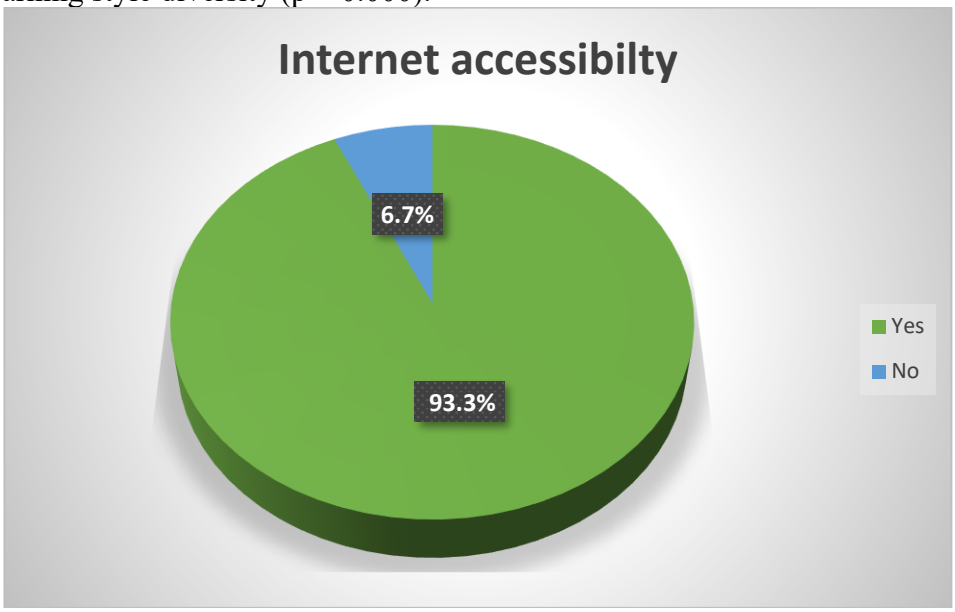


Figure 1: Access to internet regularly

Learning style preferences

VARK questionnaire was used to assess the preference of learning style among the nursing students. When learning something new, 79.4% preferred a **unimodal style**, while 18.6% preferred **bimodal**, and only 2.0% were **multimodal**. During lectures, 81.4% relied on a single method, compared to 14.5% bimodal and 4.1% multimodal. For exam preparation, 74.5% preferred one style, 24.1% two styles, and 4.1% used multiple which is explained in **table 2.**

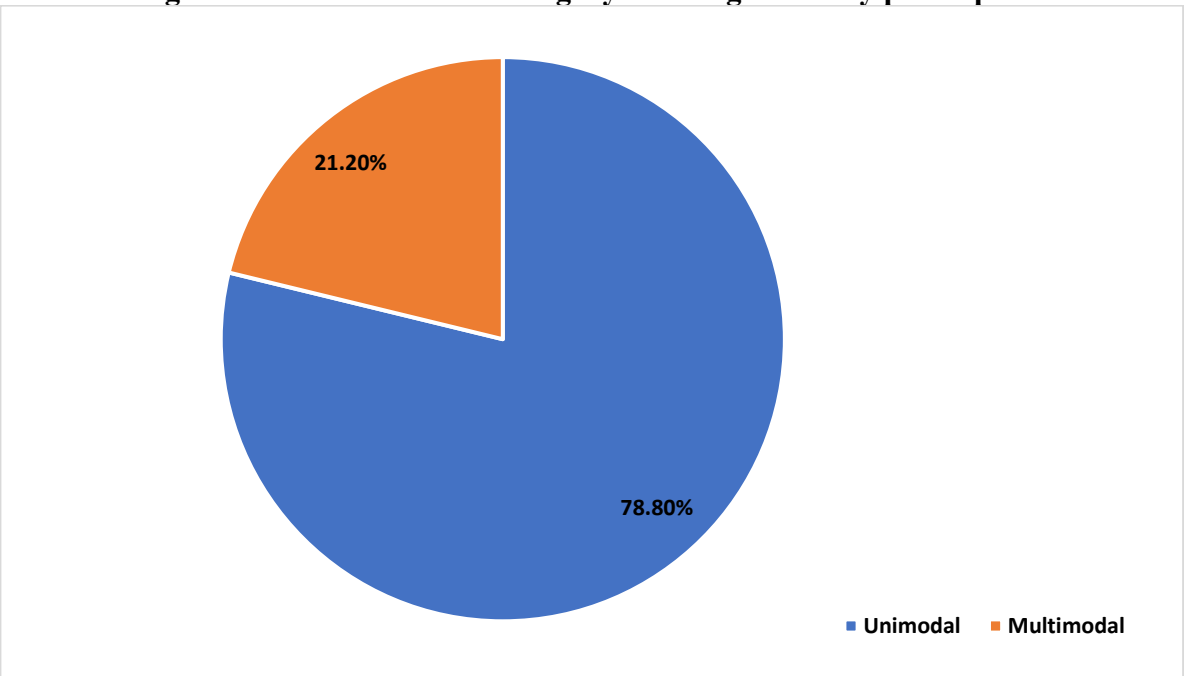
Table 2: Learning style preferences among study participants:

Questions	Unimodal	Bimodal	Multi modal
When you need to learn something new, what is your preferred method of learning?	274 (79.4%)	64 (18.6%)	7 (2.0%)
When you are attending a lecture, which of the following methods helps you understand the content best?	281 (81.4%)	50 (14.5%)	14 (4.1%)
Which study material do you find most helpful?	274 (79.4%)	49 (14.2%)	22 (6.4%)

How do you prefer to study for exams?	257 (74.5%)	74 (24.1%)	14 (4.1%)
When you are solving a problem or completing an assignment, which of the following methods do you usually use?	261 (75.7%)	56 (16.2%)	28 (8.1%)
How do you usually remember the information you study?	260 (75.4%)	64 (18.6%)	21 (6.1%)
Which of these environments help you focus better while studying?	252 (73.0%)	86 (24.9%)	7 (2.0%)
When you are learning practical skills in nursing, what method helps you most?	237 (68.7%)	101 (29.3%)	7 (2.0%)
What is your preferred mode of communication with your peers for learning?	254 (73.6%)	77 (22.3%)	14 (4.1%)
Which of the following would you find most engaging in a classroom session?	240 (69.6%)	84 (24.3%)	21 (6.1%)

Among 345 participants, maximum proportion of the study participants prefers Unimodal learning style which accounts for 78.8%. (Figure 2)

Figure 2: Preference of learning style among the study participants



Association Between Sociodemographic Variables and Learning Style Preferences

Residential background had a significant association with learning style (p = 0.04). Rural students exhibited a lower proportion of multimodal preferences. Parental education level was significantly associated with learning style preferences (p = 0.000). Students from postgraduate-educated families were more likely to prefer multimodal styles. Internet accessibility was also significantly associated (p = 0.000), with nearly all multimodal learners having regular access to the internet. Gender was not significantly associated with the type of learning style preference (p = 0.19). (**Table 3)**

Table 3: Relationship between preference of learning style and sociodemographic details:

Variable	Unimodal	Multimodal	P value
Gender			
Male	28 (43.1%)	96 (34.3%)	0.19
Female	37 (56.9%)	184 (65.7%)	
Residential Background			
Rural	14 (21.5%)	102 (36.4%)	0.04*
Semi- Urban	23 (35.4%)	66 (23.6%)	
Urban	28 (43.1%)	112 (40.0%)	

Family Educational Background			
High school	1 (1.5%)	64 (22.9%)	0.000*
Undergraduate	21 (32.3%)	144 (51.4%)	
Postgraduate	43 (66.2)	72 (25.7%)	
Internet Accessibility			
Yes	49 (75.4%)	273 (97.5%)	0.000*
No	16 (24.6%)	7 (2.5%)	

Chi square test applied, *p value <0.05 statistically significant

Discussion:

The majority of the participants were female (64.1%), while males comprised 35.9%. Most students belonged to an urban background (40.6%), followed by rural (33.6%) and semi-urban areas (25.8%). Regarding family structure, 61.7% came from nuclear families and 38.3% from joint families.

In the current study around 78% of the study participants preferred unimodal learning in any of the presented academic scenarios. Among them, read/write and kinaesthetic modalities were most preferred or convenient method of learning among the study participants. Similar findings were reported by Rawat et al., that most preferred modal of learning was considered as unimodal learning style which accounts for 62%.[8] Studies conducted by **Vishwanath et al.,** found that the nursing students preferred to use single learning style. Majority (48%) of the study participants preferred auditory style, followed by 27% preferred the visual style and 25% preferred kinaesthetic style.[9]

In contrast, findings were reported by **Wattanakul et al., and James et al.,** that kinaesthetic and read/write modalities were most convenient method learning among health science students. This might be due to the nature of clinical learning among nursing students.[4,10] The study conducted by **Bazan Perkins et al.,** reported that around 30% of the students preferred multi modal learning. In addition, kinaesthetic mode of learning was considered as the most easiest method of learning style for learning gains among the students of health sciences.[11]

Kalyanshetti et al., conducted the same research among medical students in Karnataka revealed that 35.5 % of the study participants preferred unimodal, followed which 26.9%, 16% and 21.5% preferred bimodal, trimodal and multimodal learning styles respectively. Among the unimodal learners, nearly half of the participants prefer auditory and kinaesthetic learning.[12]

In the present study, significant association present between learning preferences and internet accessibility. Similar findings were reported by **Karimian et al,** that students with more access to online resources tend to develop multimodal learning preferences.[13]

The current study shows association between parental education and learning style with statistical significance. This finding is consistent with prior literature done by **Almutairi et al.,** that the role of socio educational environment plays an important role in learning style development.[14]

Limitations:

The present study has helped the researchers and medical education to formulate the standard learning technique. However, this study has few limitations, it was conducted among selected nursing students which limits the generalizability. Self-administered questionnaire was used to assess the learning preference, which may cause social desirability bias among the study participants.

Conclusion:

The explored the learning style preferences of first year nursing students using VARK questionnaire. The findings revealed that majority of the students preferred unimodal learning style, particularly read/write and kinesthetic modalities. The results signify the importance of integrating various instructional approach in nursing education to accommodate the individual learning preferences. This study contributes to the growing evidence supporting learner-centered education in nursing and calls

for further research in broader and more diverse student populations to validate and expand upon these findings.

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Conflicts of interest
There are no conflicts of interest

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