



RESEARCH ARTICLE

Associations of learning style with cultural values and demographics in nursing students in Iran and Malaysia

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Abstract

Purpose: The goal of the current study was to identify associations between the learning style of nursing students and their cultural values and demographic characteristics. **Methods:** A non-probability purposive sampling method was used to gather data from two populations. All 156 participants were female, Muslim, and full-time degree students. Data were collected from April to June 2010 using two reliable and validated questionnaires: the Learning Style Scales and the Values Survey Module 2008 (VSM 08). A simple linear regression was run for each predictor before conducting multiple linear regression analysis. The forward selection method was used for variable selection. P-values ≤ 0.05 and ≤ 0.1 were considered to indicate significance and marginal significance, respectively. Moreover, multi-group confirmatory factor analysis was performed to determine the invariance of the Farsi and English versions of the VSM 08. **Results:** The perceptive learning style was found to have a significant negative relationship with the power distance and monumentalism indices of the VSM 08. Moreover, a significant negative association was observed between the solitary learning style and the power distance index. However, no significant association was found between the analytic, competitive, and imaginative learning styles and cultural values ($P > 0.05$). Likewise, no significant associations were observed between learning style, including the perceptive, solitary, analytic, competitive, and imaginative learning styles, and year of study or age ($P > 0.05$). **Conclusion:** Students who reported low values on the power distance and monumentalism indices are more likely to prefer perceptive and solitary learning styles. Within each group of students in our study sample from the same school the year of study and age did not show any significant associations with learning style.

Key Words: Demography; Learning; Nursing students; Iran; Malaysia

INTRODUCTION

Although the relationship between learning styles and culture has been studied for decades, gaps remain in the understanding of individual learning style in various cultural groups. The cultural backgrounds of students may lead to cultural synergy, or sometimes may cause misunderstanding in cases where conflicts exist with the pedagogical methodologies employed in academic programs. Consequently, it is crucial to

understand how cultural values influences learning style. However, the question of which learning styles are associated with which cultural values has not yet been fully resolved. Moreover, understanding socio-cultural associations with learning styles might help to identify potential differences in students' learning behaviors. The goal of this study was to identify associations between the learning style of nursing students in Iran and Malaysia with their cultural values and demographic characteristics.

METHODS

Subjects

Out of 243 subjects, only female, Muslim, and full-time de-

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Received: March 30, 2015; Accepted: July 29, 2015;

Published: August 3, 2015

This article is available from: <http://jeehp.org/>

gree students were selected. A total of 156 nursing students participated in the study, of whom 85 were from Universiti Sains Malaysia in Malaysia and 71 were from the Zabol University of Medical Sciences in Iran. All participants were female Muslim undergraduate nursing students.

Technical information

This correlational study investigated the associations of learning style with cultural values and the demographic characteristics of undergraduate nursing students. The non-probability purposive sampling method was employed to gather data from two populations, with participants selected from the Zabol University of Medical Sciences (ZBUMS) in Iran and Universiti Sains Malaysia (USM) in Malaysia. An a priori sample size for multiple linear regression using nine predictors, including cultural values (seven variables) and demographic characteristics (two variables), was estimated for an alpha value of 0.05, power ($1-\beta$) of 0.80, and a medium partial eta effect size of 0.15. The minimum required sample size was 113 [1]. Data were collected using two reliable and validated questionnaires: the Learning Style Scales (LSS) [2] and the Values Survey Module 2008 (VSM 08) [3]. The LSS is a 22-item inventory with five subscales corresponding to the perceptive, solitary, analytic, competitive, and imaginative learning styles. Perceptive students learn through the senses, by touching, observing, listening, and doing. Analytic students focus on specific and detailed information to learn more effectively. Imaginative students create a mental picture of what they listen or observe. Competitive students learn when challenged or when competing with peers. Solitary students prefer to learn or study alone, whereas sociable students learn better when participating in a group. The LSS items were scored on a six-point Likert-type scale, ranging from strongly disagree (1 point) to strongly agree (6 points), without a neutral point [3]. The raw scores were transformed to T-scores. In order to calculate the T-scores, the raw data were first standardized to Z-scores, multiplied by 10, and then 50 was added [$T\text{-score} = (10 \times Z\text{-score}) + 50$]. The T-scores ranged from 20 to 80.

The VSM 08 consists of 28 questions that measure seven cultural values or indices, including power distance (PD), individualism (IDV), masculinity (MAS), uncertainty avoidance (UA), long-term orientation (LTO), indulgence versus restraint (IVR), and monumentalism (MON). Hofstede et al. [3] defined the cultural values as follows:

“PD indicates that the less powerful members of a society expect and accept that power is distributed unequally. IDV refers to a society in which a person is expected to look after himself or herself and his or her immediate family only. MAS stands for a society in which social gender

roles are clearly distinct; men are supposed to be assertive, tough, and focused on material success and women are supposed to be more modest, tender, and concerned with the quality of life. UA is the extent to which the members of institutions and organizations within a society feel threatened by uncertain, unknown, ambiguous, or unstructured situations. LTO stands for a society that fosters virtues oriented towards future rewards, in particular adaptation, perseverance, and thrift. IVR stands for a society that allows or restricts relatively free gratification of some desires and feelings, especially those that have to do with leisure, merrymaking with friends, spending, consumption, and sex. MON stands for a society which rewards people who are, metaphorically speaking, like monuments: proud and unchangeable.”

These parameters reflect core cultural values and are very stable across time. All questions were scored on a five-point Likert type scale. The scores of the indices were calculated based on the formulas described by Hofstede et al. [3]. The score for each cultural value was derived based on the mean score of the corresponding questions based on the formula outlined by Hofstede et al. [3]. Every cultural value normally has a range of approximately 100 points.

The demographic characteristics investigated in this study were age and year of study (first, second, third, or fourth year of study). Dummy variables were created for the year of study variables, and the first year of study was assigned as the reference group. Male nursing students and non-Muslims were excluded because only one male nursing student was in the USM cohort and only one non-Muslim nursing student was in the ZBUMS cohort.

The nursing students at USM and ZBUMS were administered English and Farsi versions of the instruments, respectively. Two bilingual experts translated the original English instruments into Farsi and translated them back to English. The researchers then evaluated the invariance of the English and Farsi questionnaires. Permission to use the VSM 08 for the purposes of this study was obtained from Professor Geert Hofstede, its author, via e-mail.

Ethical approval

Ethical approval was obtained from the Ethics and Research Board (Human) of USM and was applied to both study settings. Informed consent was obtained through a cover letter. The questionnaires were distributed and collected from April to June 2010 during regular class time, in order to achieve an optimal response rate.

Statistics

The data were analyzed using IBM SPSS ver. 20.0 (IBM Co., Armonk, NY, USA) and AMOS ver. 18.0 (SPSS Inc., Chicago, IL, USA). Since the year of study was a categorical variable, it was transformed into dummy variables and the first year of study was assigned as the reference group. Cultural values and age were entered into the regression model as continuous predictors. We ran a simple linear regression (SLR) for each predictor before conducting a multiple linear regression (MLR). The forward selection method was used for variable selection. P-values ≤ 0.05 and ≤ 0.1 were considered to indicate significance and marginal significance, respectively.

In addition, multi-group confirmatory factor analysis was run to determine the invariance of the Farsi and English versions of the VSM 08. The metric of equivalence was examined because it is an essential and adequate condition for measuring regression coefficients and covariance across groups [4]. Furthermore, the comparative fit index and the root mean square error of approximation were calculated. Comparative

fit index values close to 0.95 indicate a well-fitted model and root mean square error of approximation values < 0.06 indicate a good fit, while values of 0.08-0.10 indicate a medium fit and values > 0.10 indicate a poor fit [5].

RESULTS

The average ages of 156 nursing students at ZBUMS in Iran and USM in Malaysia was 20.87 ± 1.35 years and 21.74 ± 1.13 years, respectively. All participants were female and Muslim. Among the ZBUMS nursing students, 19 (15.4%), 24 (19.5%), 66 (53.7%), and 14 (11.14%) were enrolled in the first, second, third, and fourth year of study, respectively, whereas among the USM nursing students, 11 (9.3%), 38 (32.2%), 33 (28.0%), and 36 (30.5%) were enrolled in first, second, third, and fourth year of study, respectively. Of the cultural values, only the UA index did not meet the criterion of metric invariance. Consequently, it was excluded from further analyses (Table 1).

Table 2 presents the associations between cultural values

Table 1. Model fit measures and model differences for the uncertainty avoidance index in the survey responses of nursing students at the ZBUMS in Iran and USM in Malaysia

Model tested	Model fit measures						Model differences		
	χ^2	df	χ^2/df	P-value	CFI	RMSEA	$\Delta\chi^2$	Δdf	P-value
Separate groups									
ZBUMS	0.10	2	0.05	0.950	1.00	0.000			
USM	1.26	2	0.63	0.534	1.00	0.000			
Configural invariance (unconstrained)	1.36	4	0.34	0.851	1.00	0.000			
Metric invariance (weighted)	10.42	7	1.49	0.166	0.87	0.056	9.06	3	0.028
Partial metric invariance	8.98	6	1.50	0.175	0.88	0.057	7.61	2	0.022

ZBUMS, Zabol University of Medical Sciences; USM, Universiti Sains Malaysia; χ^2 , chi-square; df, degree of freedom; CFI, comparative fit index; RMSEA, root mean square error of approximation; $\Delta\chi^2$, difference of chi-square values; Δdf , difference of degrees of freedom.

Table 2. Associations between the perceptive and solitary learning style preferences and cultural values (N = 156) among nursing students in Zabol University of Medical Sciences in Iran and Universiti Sains Malaysia in Malaysia

Learning style preferences	Cultural value	Simple linear regression			Multiple linear regression		
		Crude b	95% CI	P-value	Adjusted b	95% CI	P-value
Perceptive	PD	-0.013	-0.024, -0.001	0.036	-0.013	-0.024, -0.001	0.032
	IDV	-0.01	-0.03, 0.01	0.303			
	MAS	-0.009	-0.025, 0.007	0.287			
	LTO	0.002	-0.009, 0.014	0.696			
	IVR	0.002	-0.011, 0.014	0.782			
	MON	-0.019	-0.035, -0.003	0.023			
Solitary	PD	-0.014	-0.024, -0.004	0.007	-0.014	-0.024, -0.004	0.007
	IDV	-0.012	-0.029, 0.005	0.159			
	MAS	-0.006	-0.020, 0.008	0.393			
	LTO	0.004	-0.006, 0.014	0.420			
	IVR	-0.001	-0.012, 0.009	0.781			
	MON	0.002	-0.013, 0.016	0.819			

CI, confidence interval; PD, power distance; IDV, individualism; MAS, masculinity; LTO, long-term orientation; IVR, indulgence vs. restraint; MON, monumentalism.

Table 3. The associations between the analytic, competitive, and imaginative learning style preferences and cultural values (N = 156) in nursing students at the Zabol University of Medical Sciences in Iran and Universiti Sains Malaysia in Malaysia

Learning style preferences	Cultural values	Simple linear regression		
		Crude b	95% confidence interval	P-value
Analytic	PD	-0.003	-0.012, 0.006	0.536
	IDV	0.013	-0.002, 0.028	0.089
	MAS	-0.004	-0.017, 0.008	0.481
	LTO	0.005	-0.004, 0.014	0.261
	IVR	0.005	-0.004, 0.015	0.251
	MON	-0.009	-0.022, 0.003	0.137
Competitive	PD	0.002	-0.006, 0.011	0.614
	IDV	0.000	-0.015, 0.014	0.951
	MAS	0.003	-0.009, 0.015	0.590
	LTO	-0.005	-0.014, 0.003	0.205
	IVR	0.001	-0.008, 0.01	0.841
	MON	-0.004	-0.016, 0.008	0.517
Imaginative	PD	-0.005	-0.014, 0.004	0.246
	IDV	-0.007	-0.022, 0.009	0.388
	MAS	0.009	-0.004, 0.021	0.170
	LTO	0.000	-0.009, 0.009	0.960
	IVR	0.006	-0.004, 0.015	0.231
	MON	-0.012	-0.024, 0.001	0.065

PD, power distance; IDV, individualism; MAS, masculinity; LTO, long-term orientation; IVR, indulgence vs. restraint; MON, monumentalism.

and perceptive and solitary learning styles. The results of both the SLR and MLR showed a significant negative association between the PD and the MON indices and the perceptive learning style. A one-unit increase in the PD index (adjusted b, -0.013; 95% confidence interval [CI], -0.024 to -0.001; $P = 0.032$) and the MON index (adjusted b, -0.019; 95% CI, -0.035 to -0.003; $P = 0.020$) led to a decrease of 0.01 and 0.02 in the perceptive learning style scores, respectively. Overall, 5% of the variation in the perceptive learning style was explained by the PD and the MON values according to the MLR model ($F[2,153] = 5.05$, $P = 0.008$). Table 2 also shows a significant negative association between the PD index and the solitary learning style. A one-unit increase in the PD index was associated with a 0.01-point decrease in solitary learning style scores (crude and adjusted b, -0.014; 95% CI, -0.024 to -0.004; $P = 0.007$). Overall, 4% of the variation in the solitary learning style was explained by the PD and MON indices according to the MLR model ($F[1,154] = 7.39$, $P = 0.007$). Table 3 presents the non-significant associations between cultural values and the analytic, competitive, and imaginative learning styles (all $P > 0.05$). Table 4 demonstrates the lack of any significant associations between all learning style (perceptive, solitary, analytic, competitive, and imaginative) and year of study and age (all $P > 0.05$).

Table 4. The associations between learning style preferences and year of study and age (N = 156) in nursing students at the Zabol University of Medical Sciences in Iran and Universiti Sains Malaysia in Malaysia

Demographic characteristics	Learning style preferences	Simple linear regression		
		Crude b	95% confidence interval	P-value
Year of study	Perceptive	0.659	-0.936, 2.254	0.415
	Solitary	0.659	-0.936, 2.254	0.415
	Analytic	-0.022	-1.224, 1.180	0.971
	Competitive	-0.459	-1.603, 0.686	0.430
Age (yr)	Imaginative	0.030	-1.192, 1.252	0.961
	Perceptive	-0.164	-0.751, 0.423	0.582
	Solitary	-0.164	-0.751, 0.423	0.582
	Analytic	0.138	-0.303, 0.580	0.537
	Competitive	-0.169	-0.590, 0.252	0.430
	Imaginative	0.122	-0.327, 0.571	0.591

DISCUSSION

The current study investigated associations between the learning style of two groups of female Muslim undergraduate nursing students from Iran and Malaysia and their cultural values, age, and year of study. The construct invariance of the Farsi and English versions of the VSM 08 was evaluated using multi-group confirmatory factor analysis. Of the cultural indices, only the UA index did not meet the criterion of metric invariance, and it was therefore excluded from further investigation.

Our results showed no significant associations between demographic characteristics (year of study and age) and learning style. These findings correspond with the results of some researchers who did not find any significant correlations between age and learning modes or styles in young people [6-8]. However, the findings of the current study contrast with those of some other studies; for instance, Joy and Kolb [6] found that age was associated with a preference for the active-experimental and reflective-observation learning modes. Those modes may be comparable to the sensing learning style investigated in the current study. Chen [9] found a significant relationship between grade and kinesthetic, tactile, and individual learning style. In the current study, the participants were between 18 and 24 years of age, reflecting a homogeneous, non-dispersed distribution in the age of the study population.

We found that the PD and MON indices were negatively associated with the perceptive learning style. In large-PD societies, independent behaviors and active experimentation are not encouraged. The educational process is teacher-centered, especially in advanced subjects taught at universities. The students must follow the teachers' strict guidelines [10,11]. MON

refers to pride and stability versus humility, flexibility, and adaptability in changing circumstances. People in MON societies focus on abstract and theoretical sciences in school [10]. In high-MON societies, people are immutable, less cooperative, poorly educated, and low achievers in schools [12]. Our findings suggest that students who reported low values for both the PD and MON indices had a greater preference for the perceptive learning style. Perceptive learners need more student-centered approaches to learning. Instructors should also be flexible in supervising perceptive learners in both classrooms and clinical situations.

We also found that the PD index was associated with the solitary learning style. Solitary students tend to learn and study alone. In contrast, sociable students tend to learn and study in groups [2]. Students who reported large PD and small PD values were found to be more inclined towards the sociable and solitary learning styles, respectively. These findings support the view that the PD index negatively correlates with the independent learning style [10]. Therefore, we can state that the sociable learning style is associated with collectivist and large-PD values.

The results of the SLR showed a positive, marginally significant association between IDV and the analytic learning style. These findings correspond to arguments by Mitsis and Foley [13], as well as those of Joy and Kolb [6], that people with a high sense of in-group collectivism are more abstract and reflective learners. Analytic learners focus on and remember the details of subjects. However, they rely on their own cognitive abilities to learn independently. IDV refers to the importance of the interests of individuals over the interests of the group. In individualistic societies, people look after only themselves and their immediate family members, such as siblings. Individualistic societies aim to enable students to be independent, to have positive attitudes towards innovations, and understand 'how to learn' rather than 'how to do' [10].

Our results showed a marginally significant negative association between MON scores and the imaginative learning style. Imaginative learners create a mental picture of what they read, listen, watch, and study. They are whole-brain learners, which refers to the ability to integrate the right-brain and left-brain functions in learning situations [14]. The MON index refers to pride and stability versus humility, flexibility, and adaptability to changing circumstances. It was found that imaginative learners tended to be more flexible and adaptive to innovations. This also implies that flexible and cooperative learning environments may improve the ability of learners to be imaginative.

In conclusion, students who reported low values for the PD and MON indices had a greater preference for the perceptive and solitary learning styles. In the groups analyzed in this study,

year of study and age did not show any significant associations with learning style. Although cultural values explained a small percentage of the variation in learning style according to MLR, the identification of associations between cultural values and learning style is valuable nonetheless. These findings also indicate that cultural values are not the primary factor that explains variation in learning style. However, our findings indicate that cultural differences may affect students' acquisition of new knowledge. Furthermore, students and instructors can overcome cultural differences in teaching and learning environments to achieve improved and more consistent outcomes in global nursing education. Further studies should be carried out with different populations across many countries in order to confirm the robustness of these findings.

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CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

SUPPLEMENTARY MATERIAL

Audio recording of abstract.

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