

## ORIGINAL ARTICLE

# Professional Identity of Medical Students of Malaysia: Influence of Demographic Factors

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## ABSTRACT

**Introduction:** In medical education one of the main goal is to facilitate the development of professional identity of medical students. It is influenced by sociocultural factors whose influence has been examined by the empirical scholarship on professional identity research in a robust way. The current research studied the influence of gender, ethnicity and year of study on the professional identity of medical students using a validated instrument. **Methods:** The quantitative research approach using the cross sectional survey design is adopted in the present study. The instrument for the measurement of professional identity was developed using the items adapted from previous research. Stratified random sampling was used to collect the data from 318 participants. The reliability and construct validity of the instrument was evaluated using Smart PLS 3. Data was analysed, for descriptive and inferential statistics using SPSS version 26. **Result:** Ethnicity, gender and year of study had an impact on the professional identity of medical students. Indian ethnicity had significantly higher positive influence. The female students had higher professional identity than male medical students. As the students' progressed to higher level of their training their professional identity progressively decreased. **Conclusion:** The medical students trained with similar curricular activities and the learning experiences develop different levels of professional identity. The level of professional identity developed by the medical students in deferent gender, ethnicity, and year of study differs. The sociocultural factors need to be considered when designing activities aimed at development of medical students' professional identity.

*Malaysian Journal of Medicine and Health Sciences* (2023) 19(3):196-203. doi:10.47836/mjmhs18.5.25

**Keywords:** Professional Identity, Demographic factors, Medical students, Malaysia, Year of study

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## INTRODUCTION

Medical education is concerned with transforming novice medical students to professionals with necessary attributes to practice medicine. The focus of medical education during the past two decades changed from teaching professionalism to facilitating professional identity development (1,2). Professional identity is the ability to do the functions of the profession, possession of professional knowledge, imbibing values and ethics of the profession, identifying with the community of practice as well as personally identifying as a member of a professional group (3,4). From the medical education perspective the professional identity was defined as "a representation of self, achieved in stages over time during which the characteristics, values, and norms of the medical profession are internalized, resulting

in an individual thinking, acting, and feeling like a physician" (1, pp.1447). The professional identity development involves the personal and professional development which facilitate medical students becoming the practitioner (5). This paper examines the influence of the gender, ethnicity and the year of study on the professional identity of medical students using a validated questionnaire for the measurement of professional identity.

The theoretical foundation for the professional identity development can be traced back to more than 50 years (6). The community of practice is a social constructivist learning theory most suitable to explain the professional identity development of medical students (7–9). In medicine's community of practice medical students are the legitimate peripheral participants. They acquire knowledge, skill and become confident as well as motivated. They accept the values and norms of the profession of their choice and identify themselves with the community of the physician (10). The professional socialisation is an important component for professional

identity development. Learners ability to socialise in the community of practice determines the extent of their professional identity. The community of practice involves exchange and synthesis of knowledge as well as application of ethically appropriate knowledge during the interaction between the stakeholders.

The learners with the better knowledge about the profession they have chosen would identify themselves with their professional group readily when compared to those with less knowledge (11). Self-efficacy is positively related to the professional identity which determines how people feel, think and act (4,12,13). It affects the course of action the learners pursue, the goal set by them, their commitment to the task or activity, the level and the difficulty of the goal, the effort invested by the learners and their persistence when encountered with obstacles or faced adversities as well as the choices they make and what can be achieved (14). When the controlled actions of the learners leads to behavioural changes they believe they can do and become more committed to bring about the desired change(15). We can be safely stated that self-efficacy is positively related to the professional identity. Hence, the members of the community of practice benefit the higher level of the expertise and skill and the intrinsic motivation for participants. The values, attitudes, beliefs, actions of the learners and their self-awareness is important for the development of professional identity.

The professional identity development is a continuous process. The complex process of professional identity development would be influenced by the critical factors related to the individuals such as race, gender, culture and socioeconomic status (1,5). Since the sociocultural factors influence the professional identity of the medical students it is a requisite to include these factor in the professional identity research which is rarely evidenced to date. However, the empirical scholarship did not examine the influence of the sociocultural data like ethnicity, gender in a robust way in the analysis and interpretation in professional identity research. The scoping review and metanalysis by Volpe RL et al. (2019) described how the empirical research on professional identity suffers the sociocultural bias (5). Probably the experience of the professional identify formation may differ between the members of different sociocultural groups. Wyatt et al. (2020) described that in the professional identity research the influence of ethnicity and race were often ignored which resulted in undervaluing the challenges faced by the physicians especially underrepresented in medicine (16). These observations in literature revealed that majority of the studies neglected the influence of sociocultural factors.

The scales available for professional identity are still at its infancy. There is no evidence for the availability of single reliable and validated scale for the measurement of the professional identity of the medical students

(17). The available self-reporting questionnaires for the determination of professional identity were for different professions. Hence, the goal of each scale developed is different. Besides, most of these scales do not have an evidence of the stability of their factors by using structural equation modelling (18). The complexity of the construct professional identity necessitates different tool to measure professional identity (17). In the current research to measure the professional identity of the medical students an instrument was developed by adapting the items from previous research and validated. The present study examined the influence of gender, ethnicity and year of study on the professional identity of the medical students.

## MATERIALS AND METHODS

### Study design, setting and participants

The study was conducted on medical students in a private university of Malaysia. The cross sectional survey method was used to determine the professional identity of the medical students. The university offers five year medical course. There was a difference in the number of students in different years of study. Medical students across different years constituted the accessible population.

### Sample size and Sampling technique

The student directory was obtained from the medical school. The sample size of 265 was calculated using the table for sample size decision provided by Krejcie and Morgan (19). However, an additional 20% is added to compensate for the non-responses (20). So the total number of 318 medical students across five different years (five different strata) of the training were included in the present study. The percentage of students selected from each year included in the study was proportionate to the number of students in that year of study. The sample was collected using stratified random sampling technique. The study was conducted after obtaining the approval from University Ethics Committee of Management and Science University (Ethics No: MSU-RMC-02/FR01/01/L1/016).

### Measurement Tool

The questionnaire was developed by adapting items from the measurement scales used in previous studies (11,18,21,22). The questionnaire consisted of 16 items to be scored on a five point Likert scale where score 1-‘strongly disagree’ and 5-‘strongly agree’. The experts in the medical education were consulted for validation of the content of the scale. After the content validation it was pretested on a group of medical students to identify and correct the inconsistencies in the items. The questionnaire was pilot tested on 40 medical students who were not part of the study. The Cronbach’s alpha value determined for the questionnaire was 0.943 which was much above 0.7 indicating excellent reliability of the questionnaire (23).

## Data collection

The questionnaire was distributed using electronic platform to randomly selected medical students of different years. The informed consent was obtained from the respondents. They were informed about the objective of the study, anonymity of the data and their right to refuse to answer the questionnaire. The electronic platform was set in such a way that respondents can move to the next page as well as can submit at the end only after answering all the items in that page. This measure was taken to avoid any missing data.

## Statistical analysis

Data collected was analysed using SPSS version 26 and Smart PLS 3.3. The principle component analysis was used to factorise the items of the scale. Cronbach's alpha was determined to examine the reliability of the scale. The construct validity of scale was examined by assessing the convergent and divergent validity. The descriptive and inferential statistical analysis of the data was performed. Regression analysis was used to assess the influence of gender, ethnicity and the year of study on the professional identity.

## RESULTS

The data was collected from 318 medical students of different gender and ethnicity across different years of study. The skewness has the tendency to impact the mean and the kurtosis severely affect the variance and the covariance statistics (24). The observed skewness

and kurtosis values in the current research is much less than the cut-off value stated by Kim, (2013) indicate that the data is normally distributed (24, 25).

## Principal component analysis

Principal component analysis (PCA) using varimax rotation with Kaiser normalisation was used to factorize the items of the scale. To ensure the suitability of the data for the PCA Kaiser-Meyer -Olkin (KMO) test for sample adequacy was performed. The KMO value was 0.938 which is well above the cut-off point 0.50 indicating the sampling adequacy. Bartlett's test for sphericity was significant ( $\chi^2 = 2146.05$ ,  $df = 120$ ,  $p < 0.01$ ) which indicative of factorability of the correlation matrix. Using the eigenvalue of 1.0 and factor loading  $\geq 0.5$  three factors were extracted (Table I) which accounted for 57.6% of the total variance which is well above the minimum threshold value 50% (26, 27). The reliability of the factors and overall scale were determined using Cronbach's alpha. Which is well above the recommended cut-off value of 0.7 indicating the good reliability of the instrument (Table I). Following the PCA confirmatory factor analysis was performed to examine the reliability and validity of the factors extracted by PCA

## Confirmatory factor analysis

The confirmatory factor analysis (CFA) revealed the variance inflation factor (VIF) was less than 3.3 which indicates that there are no collinearity issues. The validity of the construct was assessed by examining the convergent and divergent validities (28,29). The

**Table I. The Factor Loadings, Reliability and Validity Measures of the Professional Identity Measurement Scale**

Items	Knowledge & socialization	Professional self-efficacy	Professional Behavior
I am pleased to belong to the profession of doctor	0.642		
I have a good idea about role and responsibilities of my future profession as doctor	0.608		
I am aware of the impact of my decision as a doctor on the health care industry	0.573		
I feel adhering to the codes of conduct of the institution is the basis of correct behavior as a doctor	0.729		
I would be happy to play a role to benefit the society or organizations even if I do not get the individual recognition	0.666		
I respect my colleagues' opinions when I have a conflict of opinion with them	0.733		
I am comfortable to work in a culturally diverse environment	0.778		
I always dress and behaving professionally	0.603		
I am constantly reflecting and analyzing on my actions to improve by behavior as a doctor	0.627		
I am able to identify myself positively with the doctors		0.620	
I imagine myself as a professional when I am working on the problems in the class		0.642	
I am confident that I will master all the skills necessary to succeed in my feature profession		0.792	
I feel like being recognized when acknowledged by colleagues or senior physicians		0.671	
I can be close friend with my colleagues who have the same concerns and interests like me		0.513	
I feel like an expert in my field when reflecting on my experiences to identify the learning needs		0.505	
I use my own beliefs and ideals as standards to evaluate my own actions as doctor			0.614
I set aside my self-interest to meet the expectations of the society			0.702
I have a good idea about the rules and regulations of the health care industry			0.676
I keep myself up to date with the developments in my feature profession			0.568
	Knowledge & socialization	Professional self-efficacy	Professional Behavior
Cronbach's Alpha	0.897	0.820	0.752
Overall Cronbach's Alpha		0.920	
Composite Reliability	0.918	0.870	0.846
Variance inflation factor	2.493	2.188	1.838
Average Variance Extracted (AVE)	0.557	0.529	0.581

composite reliability (CR) and average variance explained (AVE) of the factors were examined to determine the convergent validity. Composite reliability of the factors varied from 0.758 to 0.864 which is above 0.700, the recommended minimum value (29). The AVE was well above the cut-off value of 0.5 (29). The correlation between two different factors is less than square root of AVE of each of the factor as shown in Table 2 (30). The heterotrait-monotrait ratio of correlation also indicated that ratio between the mean value of the correlation between the items across the factors to the mean of the average correlation among the items measuring the same factor, was less than 0.85 the cut off value (Table II) (29,31) . This provides evidence of a good discriminant validity between the factors.

**Table II: Discriminant Validity**

Fornell- Larker Criterion			
	Professional Behaviour	Knowledge & socialisation	Professional self-efficacy
Professional Behaviour	<b>0.746*</b>		
Knowledge & socialisation	0.690	<b>0.727*</b>	
Professional self-efficacy	0.656	0.636	<b>0.762*</b>
Heterotrait-Monotrait ratio of correlation			
	Professional Behaviour	Knowledge & socialisation	
Knowledge & socialisation	0.783		
Professional self-efficacy	0.801	0.775	

\*Square root of AVE

**Influence of demographic factors on the professional identity**

The data was collected from 318 medical students of different gender and ethnicity across different years of study. The number of male medical students (26.1%) were less than that of females (73.9%) medical students. The medical students of Malay ethnicity constituted 54.2%, Chinese 3.1 Indian 37.4 and remaining other ethnicities 5.3%. The medical students of year one to year five consisted on 22.6%, 23.6%, 21.1% 17.6% and 15.1% respectively.

The linear regression analysis with female medical students as the reference had shown no significant influence of gender on the professional identity. However, the male medical students had lower score for professional identity compared to female students. The negative association between the gender and professional identity accounts for 1% of the variance of professional identity. Similar observations made on the influence of gender on different dimensions of the professional identity scale (Table III).

The influence of the ethnicity on the professional identity was also analysed using linear regression analysis taking medical students of the Malay ethnic group as the reference. Results had shown positive association of the ethnicity with professional identity. It accounted

**Table III: Influence of Gender on Professional Identity**

	Gender	Mean	± SD	Beta (95%)	R <sup>2</sup>	p Value
Professional identity	Male	4.17	0.52	-0.101	0.010	0.073
	Female*	4.29	0.48			
Knowledge & Socialization	Male	4.36	0.52	-0.089	0.008	0.114
	Female*	4.45	0.46			
Professional self-efficacy	Male	4.06	0.68	-0.104	0.011	0.064
	Female*	4.20	0.55			
Professional Behavior	Male	3.99	0.67	-0.066	0.004	0.239
	Female*	4.09	0.66			

Males=26.1%  
Females= 73.9%

\* Group with highest number of participants (Females) was taken as reference group; Significance level p <0.05

for 4.6% of variance in professional identity. The Indian ethnicity had significantly (<0.001) stronger professional identity (Table 4). Similarly in all three domains of professional identity medical students of Indian ethnicity had significantly (<0.05) higher scores (Table IV).

The linear regression analysis considering the year two students as reference group had revealed that year one medical students had highest professional identity when compared to students of all other years. A variation of 1.9% on professional identity was explained by the year of study of the medical students. Preclinical students (year one & two) had higher mean score for professional identity when compared to medical students in the clinical years (Table V). Similar changes in the mean scores for different domains of professional identify was also observed across different years of study (Table V). However these changes were not significant.

**Table IV: Influence of Ethnicity on Professional Identity**

		Mean	± SD	Beta (95%)	R <sup>2</sup>	p Value
Professional identity	Malay*	4.17	0.50	0.012	0.046	0.827
	Chinese	4.20	0.51			
	Indian	4.39	0.46			
	Other	4.28	0.38			
Knowledge & Socialization	Malay*	4.35	0.50	-0.007	0.380	0.907
	Chinese	4.33	0.45			
	Indian	4.54	0.44			
	Other	4.52	0.26			
Professional self-efficacy	Malay*	4/06	0.60	0.031	0.036	0.581
	Chinese	4.17	0.62			
	Indian	4.30	0.57			
	Other	4.21	0.49			
Professional Behavior	Malay*	3.96	0.68	0.023	0.192	0.688
	Chinese	4.05	0.65			
	Indian	4.23	0.61			
	Other	3.98	0.65			

Malay - 54.2%  
Chinese - 3.1%  
Indian -37.4%  
Other - 5.3%

\*Group with highest number of participants (Malay) was taken as reference group; Significance level p <0.05

**Table V: Influence of Year of Study on Professional Identity**

	Year of Study	Mean	± SD	Beta (95%)	R <sup>2</sup>	p Value
Professional identity	Year 1	4.35	0.47	0.058		0.400
	Year 2*	4.29	0.51		0.019	
	Year 3	4.20	0.47	-0.074		0.281
	Year 4	4.17	0.45	-0.091		0.175
	Year 5	4.25	0.54	-0.025		0.704
Knowledge & Socialization	Year 1	4.51	0.45	0.044		0.528
	Year 2*	4.46	0.50		0.015	
	Year 3	4.37	0.48	-0.071		0.299
	Year 4	4.35	0.47	-0.086		0.200
	Year 5	4.43	0.48	-0.024		0.722
Professional self-efficacy	Year 1	4.30	0.53	0.084		0.226
	Year 2*	4.18	0.62		0.020	
	Year 3	4.10	0.59	-0.055		0.423
	Year 4	4.06	0.55	-0.075		0.262
	Year 5	4.12	0.66	-0.039		0.556
Professional Behavior	Year 1	4.12	0.67	-0.003		0.964
	Year 2*	4.13	0.67		0.010	
	Year 3	3.99	0.65	-0.084		0.223
	Year 4	3.97	0.60	-0.089		0.186
	Year 5	4.10	0.74	-0.014		0.835

Year 1 - 22.6%

Year 2 - 23.6%

Year 3 - 21.1%

Year 4 - 17.6%

Year 5 - 15.1%

\*Group with highest number of participants (Year 2) was taken as reference group; Significance level p &lt;0.05

## DISCUSSION

The present study evaluated the influence of the gender, ethnicity and the year of study on professional identity of medical students using a validated questionnaire. The demographic profile of the participants showed that the majority of the participants were female medical students. This is a common finding in the medical schools and the higher education institutions where the number of female students are more than males as reported by various researchers (32–34). The Malays are the major ethnic group in Malaysia. In the current research number of medical students belonging to the Malay ethnicity outnumbered students of other ethnic groups. It is closely followed by the medical students of Indian ethnicity whereas, the medical students of Chinese and all other ethnic groups accounted for smaller percentage of participants. Similar observations were reported by different researchers (33,35).

Gender was a predictor of the baseline professional identity of the students. The gender stereotypes and the traits would have an impact on the relationships and interactions among the group members and development of professional identity. In the current research a lower professional identity in male medical students was observed compared to female students. In a study by Cui et al. (2022), reported that females working at Centre for Disaster Control and Prevention of COVID

19 had higher professional identity (13). Adams et al. (2006) reported higher professional identity in females in health and social care context which is consistent with our findings (11). The study by Monrouxe et al. (2017) observed that gender has significant influence on the personal burnout and patient related burnout. The males had significantly higher patient related burnout (36). Burnout was significantly negatively related to the professional identity(36). The gender is an important factor influencing the nature as well as frequency of the interprofessional interactions. It mainly operates in the course of social perception suggesting that the level of professional identity displayed by the men and women are different as well as their experience is also qualitatively different (11,37). A difference in the gender, class as well as other factors can affect the learning environment which hinder the development of professional identity (38). According to the observation by Lai (2022) female medical students scored significantly higher for the two different dimensions namely professional cognition and the professional environment of the professional identity scale used in their study (39).

The professional identity development is a process which involves negotiation among the individuals and the community of which they desire to be a member. The present study found medicine was not always been a welcoming community which excludes minorities (9). The present study demonstrates significantly higher professional identity among the medical students of Indian ethnicity. The medical students of Indian ethnicity had shown significantly higher scores in all three domains of professional identity scale namely knowledge and socialisation, professional self-efficacy and professional behaviour (Table IV). A research report of Wyatt et al. (2020) explains similar findings in their qualitative study (16). The students underrepresented in medicine could negotiate through the forces that influence and shape the professional identity. The learners by using the identity cues and interaction to bring the medical communities perceptions into alignment with how they viewed themselves. Even as their identities were in flux, they intentionally present themselves in a way that would garner acceptance from the medical community and engage in activities to integrate their racial and professional identity.

The present research showed as the medical students progressed from year 1 to year 4 their professional identity progressively decreased. However, in year 5 it increased again. Similar findings were reported by Carpenter (1995) in nursing students where the final years nursing students did not show strong professional identity (40). Hind et al. (2003) also had shown stronger professional identify in health care students of the early years of study (41). Cui et al. (2022) noted the negative relationship between the level education of the participants and their professional identity as they tend to be more fatigued (13). The findings of Lai et al. (2022) showed a clear

cut relation between the year of study and the declining professional identity which echoes the findings of the our research (39). They stated that professional identity of the medical students gradually declined from the freshman year till the fifth grade. However, at graduation, their level of professional identity started increasing. It may be related to the duration of the course and the complexity of the medical training. There is a significant academic demand creating a pressure among the learners as they progress through different years (42). The medical students join the training with higher level of motivation and higher expectations. However, in medicine the learning environment is complex and the expectations from the patients may be too high as well as patients trust on the doctors is reducing, resulting in strained relationship between the doctors and patients. The public opinion may adversely affect and be responsible for decrease in the professional identity of the medical students (39). Higher level of motivation is seen in medical students in the preclinical years which decreases over the clinical years (43). At the graduation the satisfaction of the accomplishment, the values of the profession which they imbibed and the understanding of the professional status would lead to gradual increase in their professional identity (39). It implies that the decrease in motivation over the years may be responsible for decreased professional identity of medical students as they progress through different year of study.

The findings of the current research based on the medical students perception in one medical school which limits the generalisability. The percentage of the medical students of different ethnicity does not exactly reflect the ethnic composition of the general population. The number of female and male medical students are not comparable which might influence the statistical analysis. The medical students join the training with the high level of motivation their response to the professional identity survey items may not be reflecting the actual perception.

Further qualitative research could explore the factors responsible for the decrease in the level of professional identity of medical students belonging to major ethnic group and at higher level of study. The study could be conducted on larger population including medical students from different medical schools. The medical educators need to design activities targeted at facilitating the professional identity development of the medical students in higher years of study.

## CONCLUSION

The professional identity of the medical students was influenced by the demographic factors and their level of training. The sociocultural factors need to be considered when designing activities aimed at development of professional identity of medical students'. The medicine's

community of practice must be welcoming disregarding the gender, race and socioeconomical status or social structure which facilitates the process of professional identity development.

## ACKNOWLEDGEMENTS

The authors acknowledge the support expended by Management and Science University during the study as well as all student who readily participated in this research.

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