

A Cross Sectional Study on the Association Between Empathy and Lifelong Learning Among Clinical Year Medical Students in MMMC, Malaysia

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Abstract

Lifelong learning is one of the qualities that is crucial in moulding a competent and all rounded professional which is defined as the continuous process of gaining knowledge as a form of personal and professional development. In this study our aim was to determine the association between empathy and lifelong learning among clinical year medical students in Melaka Manipal Medical College as well as its association with other variables such as self-efficacy and gender and to assess the students' level of empathy and lifelong learning. This research was an analytical cross-sectional study conducted on 194 students who were given a questionnaire which included 3 main scales: The Toronto Empathy Questionnaire, The Lifelong Learning Questionnaire and the New General Self-Efficacy Scale consisting of 16-items, 14-items and 8-items respectively. The lifelong learning scale was subcategorised into 5 mains domains (goal setting, application of knowledge and skills, self-direction and evaluation, locating information and adaptable learning strategies). In order to analyse the data accordingly, unpaired t test, ANOVA and correlation were used. The results showed that there were significant positive correlations between each domains of lifelong learning and empathy. Another important finding was that the correlation between lifelong learning and self-efficacy also yielded significant positive correlations except adaptable learning strategies, which showed no significant association. Moreover, ethnicities had a significant association with application of knowledge and skills, self-direction and evaluation and total lifelong learning score along with nationality which had a significant association with application of knowledge and skill. Lastly, gender had a significant association with adaptable learning strategies with males having a higher mean score of 0.87. In conclusion, an individual with higher empathy and self-efficacy would have a higher tendency for lifelong learning.

Keywords

Lifelong Learning, Empathy, Self-efficacy, Medical Students, Clinical Students

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1. Introduction

Lifelong learning is defined as a continuous process of gaining knowledge formally or informally at any place or time as a form of personal and professional development. [1-3] It is one of the qualities that are crucial in moulding a competent and all rounded professional. Lifelong learning has its own benefits

such as the ability to enhance our self-esteem and confidence, challenge our beliefs and ideas, provide ease to achieve a better personal life, makes us able to face any risk and adapt to any sudden changes, improve our understanding of the world around us, the quality of our life gets improved and give us an abundant of better options. [4]

In medicine, lifelong learning has been identified as an

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element of professionalism. Instilling the lifelong learning habit among medical students and physicians had been a consistent recommendation made by professional organizations. One of the 9 Principles of Medical Ethics adopted by the American Medical Association, stated that: "A physician shall continue to study, apply, and advance scientific knowledge...." Over the years, the medical profession has seen significant advancement in educational activities, across a range of formats and processes, to help physicians remain current and enhance professional performance. This is important because healthcare is an ever-changing field of practice with various advances in medicine, new treatment options, and changing governmental regulations. Therefore, it's required by healthcare workers to remain relevant and continue providing safe and effective care to the patients. [5-10]

On a global context, lifelong learning has been around for 2000 years and great emphasis has been given to its development especially between the 1980s-1990s in countries such the United States, Australia and the United Kingdom. Up until the 1980s, education was not universally approached as a lifelong process and only serve as a means for certification purposes. With rapid changes in the working landscape and new developments in terms of job requirements, lifelong learning has become an integral element in contributing to the employability of an individual. In America, a large majority consider themselves as lifelong learners, whether that means obtaining knowledge to gain the necessary skills for their job or simply reading on what caught their interest. According to the new Pew Research Center survey, 73% of adults in America consider themselves to be lifelong learners in which 74% are personal learners while 36% are professional learners. Personal learners are those that have participated in at least one of a number of possible activities in the past 12 months to advance their knowledge about something that is of personal interest to them. Professional learners are those who have underwent a course or gotten additional training to improve their job skills or expertise pertaining to career advancement. A variety of factors are linked to the average American's learning activities. One of them being level of education where those with more formal education are more likely to pursue learning activities. Those with a higher household income are more likely than others to be both professional and personal learners. Race and ethnicity also played a role in which Caucasians are more likely to pursue learning activities. One's own personal outlook and the desire to fulfil their time with enriching activities can also contribute to their learning style. [11]

There are many variables that play an important role in lifelong learning such as empathy, self-efficacy and gender. A

study regarding empathy and lifelong learning was conducted in Turkey, Empathy was defined as the capability to comprehend the feelings of others while lifelong learning was defined an individual's continuous search for knowledge. Empathy is thought to be associated in lifelong learning by allowing a more conducive environment for learning by improving pro-social behaviour, academic performances and by aiding to thrive in a rapidly changing world. [12] The study focused in determining the level of empathy and lifelong learning in preclinical students. It was a random experimental study and was concluded that empathy and lifelong learning levels were low for all kinds of educational activity. [13-15] Next, a study was conducted to examine the effect of general self-efficacy of CEIT preservice teachers on their lifelong learning tendencies and significant positive relationship was discovered. This finding supports the view of Firmin and Miller (2005) who argue that lifelong learners are more likely have positive attitudes toward learning, have a higher level of self-confidence and able to bounce back from adversity better. However, in that study there was a weak correlation which, as the article explained might be a result of Turkish culture which resulted in them being more conformist in terms of learning further. [16, 17] Lastly, gender plays a vital role in lifelong learning as the opportunity to access learning and teaching resources are different for each gender. Studies have shown that men have a higher tendency to engage in lifelong learning as compared to females. This is mainly due to family related responsibilities or obstacles which women must face. Whereas men are more likely to be career oriented. Moreover, a research conducted by Desjardins, Rubenson, & Milana (2006) shows that gender may play different roles depending on the development of the country. Generally, in countries where women obtain less education than men, women were found to be less engaged in lifelong learning. [18-20]

However, in Malaysia, lifelong learning was quite a relatively recent endeavour. Lifelong learning is seen as a necessary investment to move towards a knowledge-based economy in the information communication technology era for Malaysia to become a developed nation by the year 2020. Enculturation of lifelong learning is one of the components of the National Higher Education Strategic Plan. According to the blueprint of lifelong learning for Malaysia 2011-2020, lifelong learning is defined as learning undergone by individuals aged 15 and 64 years and above. 'Professional students' are those who enrol in an academic institution whether it'd be school, college or university with the sole aim of obtaining an academic qualification as first time entrants into the labour force. Implementation of lifelong learning is carried out through various ministries. More than 1.3 million Malaysians have benefited from lifelong learning courses set up by the Ministry of Higher Education,

Malaysia. As predicted by Minister of Higher Education Malaysia, there is an increase in the number of lifelong learners in Malaysia. [21]

The study about empathy and lifelong learning among medical students has been done in Malaysia but to our knowledge, [22-24] the association between empathy and lifelong learning among medical students in Malaysia has never been done therefore we focused on the association of empathy and lifelong learning among clinical year medical students in Melaka-Manipal Medical College, Malaysia.

Our research objectives are:

- a) To assess the level of empathy among clinical year medical students in Melaka Manipal Medical College, Malaysia.
- b) To assess the level of lifelong learning among clinical year medical students in Melaka Manipal Medical College, Malaysia.
- c) To determine the association between the empathy and lifelong learning among clinical year medical students in Melaka Manipal Medical College, Malaysia.
- d) To determine the association of other variables such as self-efficacy and gender in relation to lifelong learning.

Finally, the hypothesis of our study was that the more empathetic a person was, the higher the tendency for lifelong learning.

2. Methodology

2.1. Study Design, Study Setting

This was an analytical cross-sectional study to discuss about the association between empathy and lifelong learning among clinical year medical students in Melaka-Manipal Medical College, Malaysia. This study was carried out from October 2019 to December 2019 in Melaka-Manipal Medical College (Muar Campus), Malaysia.

2.2. Study Population

Melaka-Manipal Medical College has a total of 3 different undergraduate programs such as Foundation in Science (FIS), MBBS and BDS that are based both in Melaka and Muar. The FIS and BDS students are based in the Melaka Campus. However, the MBBS students in Semester 6 and 7 are based in the Muar Campus while the MBBS students in Semester 8, 9, and 10 students are based in the Melaka Campus. The study population consisted of students that were currently involved in the clinical phase of the undergraduate medical program at Melaka-Manipal Medical College which included Semester 6, 7, 8, 9, and 10 medical students that summed to a

population of 750 students.

2.3. Sample Size

We had calculated our sample size with the aid of an application known as Epi Info and based our calculations on the percentage of professional learners in America according to the Pew Research Centre. [11] The research had shown that 36% of the adults in America were professional learners, therefore for our sample population of 750 medical students, the sample size was estimated to be around 185 students with a margin of exposure of 6%.

$$\begin{aligned} N_{\text{final}} &= n_{\text{calculation}} / 1 - \text{non response \%} \\ &= 185 / 1 - 0.2 \\ &= 231.25 \end{aligned}$$

With the inclusion of a non-response rate of 20%, the final sample size of this study was 232 students.

2.4. Sampling

The sampling strategy for this study was purposive in nature which meant that the sample was selected according to the ability of the participant to satisfy the study's needs, therefore it limited us to only include the clinical year medical students. Those who satisfied the participation criteria shared a similar clinical background, had completed the self-administered questionnaires provided, and was currently involved in the Melaka-Manipal Medical College clinical phase program that took place in Melaka and Muar whereas, while there were students who did not meet to the criteria such as an incomplete questionnaire, absence on the day of data collection, pre-university and preclinical students in Melaka-Manipal Medical College were excluded from this study. Data was collected from the MBBS students of Melaka Manipal Medical College who are residing in the Muar and Melaka campus in the state of Johor and Melaka respectively in November of 2019. Students from semester 6, 7, 8, 9 and 10 participated in the study and the data for this study was collected using a self-administered questionnaire and an online questionnaire. Questionnaires were handed out to the students of semester 6 and 7 while online questionnaires were sent to the students of semester 8, 9 and 10. The survey was administered during the student's lunch break and it took about 15 minutes to administer them.

2.5. Data Collection

The independent variables in this study included empathy and self-efficacy while our outcome was to study its association with lifelong learning. The questionnaire we had prepared were self-administered and had been made up of 4 distinct parts; A (Socio-Demographic), B (Empathy), C (Lifelong Learning) & D (Self-Efficacy). In which we have

included 3 different questionnaires namely The Toronto Empathy Questionnaire, The Lifelong Learning Questionnaire and the New General Self-Efficacy Scale.

2.5.1. Socio-Demographic

The socio-demographic section consisted of 5 variables such as gender, ethnicity, nationality, semester and age of the participants.

2.5.2. Empathy Scale [25]

The Toronto Empathy Scale is a self-reported 16-items questionnaire developed to assess empathy as a primarily emotional process. Examples of statements presented within the TEQ include, "It upsets me to see someone being treated disrespectfully"; "I am not really interested in how other people feel" and "I enjoy making other people feel better". The participants are then required to rate the degree of how much they agree with each of the statements on a scale of 0-4 (with '0' being 'never', '1' being 'rarely', '2' being 'sometimes', '3' being 'often' and '4' being 'always'). There are reverse scoring being applied for items 2, 4, 7, 10, 11, 12, 14 and 15. The participants' score was then calculated by summing up the answers from each 16 statements, with 0 being the minimum total score and 64 being the maximum total score. Participants' with higher total score are considered to have a higher level of empathy, while participants with lower total score are considered to have a lower level of empathy. From a previous study, the TEQ has demonstrated a satisfactory internal consistency reliability with a Cronbach's alpha coefficient at 0.72. [26]

2.5.3. Lifelong Learning Scale [27, 28]

The Lifelong Learning Questionnaire was developed by John R. Kirby, Christopher Knapper, Patrick Lemon and William J. Egnatoff (2010) which consists of 14-items on five distinct characteristics of lifelong learning. The subscales and the sets of items they are derived from are as follows:

Goal setting: Item no. 1, 6, 7, 9, 14

Application of knowledge and skills: Item no. 5, 10, 12

Self-direction and evaluation: Item no. 8, 13

Locating information: Item no. 11

Adaptable learning strategies: Item no. 2, 3, 4

Each item was graded based on the five-point Likert scale, ranging from -2 (Strongly Disagree) to +2 (Strongly Agree). Out of the 14 items, 7 are of positive statements and the remaining 7 are of negative statements. Analytically, the positive items were scored -2 for 'Strongly Disagree' to +2 for 'Strongly Agree' in contrast to negative items which were reversely scored. Hence, the lowest total score for the questionnaire is -28 whereas the highest total score is 28,

whereby the higher the score is the more likely you are to be engaged in lifelong learning.

2.5.4. Self-efficacy Scale [29]

The New General Self-Efficacy Scale (NGSE) by (Chen, Gully & Eden, 2001) consisted of 8 items. The NGSE scale was scored on a using a 5-point likert scale (1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree), to which the respondents showed how much they agreed with the eight statements, such as "I am confident that I can perform effectively on many different tasks." The calculation of the total score is done by taking the average rating of the items and dividing this sum by the total number of items. These scores can then be ranged from 8 to 40, with higher scores indicating higher self-efficacy.

2.6. Data Processing and Data Analysis

The data was analysed by using software applications such as Microsoft Excel and Epi Info. Microsoft Excel was used to enter in the data collected and Epi Info for data processing purposes. Our study was a descriptive quantitative study which included multiple variables that was analysed by using mean and standard deviation values. The following variables were included in the analysis: 5 demographic questions, empathy scale items and lifelong learning items. Odds ratio was used as a measure of association between the variables. The level of significance in this study was 0.05 (5%).

Table 1. Dependent Variables and Statistical Testing.

Independent Variables	Dependant Variables	Statistical Testing
Gender	Lifelong Learning	Unpaired t test
Age (years)	Lifelong Learning	Unpaired t test
Ethnicity	Lifelong Learning	ANOVA
Nationality	Lifelong Learning	Unpaired t test
Semester	Lifelong Learning	ANOVA
Empathy	Lifelong Learning	Correlation
Self-efficacy	Lifelong Learning	Correlation

2.7. Ethical Consideration

The respondents' participation was voluntary, and they had the rights to withdraw from the study if they had wished to do so. Respondents participated based on an informed consent where they were provided with adequate information about the study that they had undertaken, and all the data provided from their responses were kept under strict confidentiality. Respondents' anonymity was maintained, and approval was garnered from the faculty of medicine's research ethics committee of Melaka Manipal Medical College, Malaysia.

3. Results

Table 2. Socio-demographic characteristics of clinical medical students (n = 194).

Variables	Categories	n (%)
Age (years)	<22	70 (36.08%)
	≥22	124 (63.92%)
Gender	Male	71 (36.60%)
	Female	123 (63.40%)
Ethnicity	Malay	47 (24.23%)
	Chinese	57 (29.38%)
	Indian	61 (31.44%)
	Others	29 (14.95%)
Nationality	Malaysian	179 (92.27%)
	International	15 (7.73%)

Among the 194 participants, 70 (36.08%) of them were under 22 years of age and 124 (63.92%) of them were 22 years and above. Meanwhile, 71 (36.60%) participants were male and 123 (63.40%) participants were female. As for ethnicity, 47 (24.23%) participants were Malay, 57 (29.39%) participants were Chinese, 61 (31.44%) participants were Indian and lastly the minority of 29 (14.95%) participants represented the 'others' category. 179 (92.27%) of these participants represented Malaysian for nationality whereas 15 represented the International category.

Table 3. Empathy, Lifelong learning, self-efficacy among clinical medical students.

Variables	Mean (SD)	Min, Max
Empathy (0, 64)	45.98 (7.97)	20, 64
Lifelong learning		
(a) Goal Setting (-10, 10)	2.30 (2.62)	-5, 10
(b) Application of Knowledge and skills (-6, 6)	2.43 (1.54)	-3, 6
(c) Self-direction and evaluation (-4, 4)	1.07 (1.44)	-3, 4
(d) Locating information (-2, 2)	0.13 (1.09)	-2, 2
(e) Adaptable learning strategies (-6, 6)	0.40 (1.79)	-6, 4
Total score (-28, 28)	6.32 (5.35)	-6, 22
Self-Efficacy (8, 40)	29.15 (4.31)	16, 40

The empathy questionnaire consisted of 14 items in which the students scored between 20 to 64. The mean score obtained was 45.98 (SD=7.97). As for the lifelong learning questionnaire, the mean score for goal setting was 2.30 (SD=2.62) which ranged from -5 to 10. Application of knowledge and skills had a mean of 2.43 (SD=1.54) ranging from -3 to 6, self-direction and evaluation score had a mean of 1.07 (SD=1.44) ranging from -3

to 4, locating information score had a mean of 0.13 (SD=1.09) ranging from -2 to 2, adaptable learning strategies had a mean score of 0.40 (SD=1.79) ranging from -6 to 4 and lastly the mean total score for lifelong learning was 6.32 (SD=5.35). Likewise, self-efficacy mean score obtained by the students was 29.15 (SD=4.31) with the minimum score being 16 and maximum score being 40.

Table 4. Association between socio-demographic data and goal settings.

Variables	Categories	Goal Settings mean (SD)	Mean Difference (95% CI)	t (df)/F (df1,df2)	P value
Age (years)	<22	2.37 (2.88)			
	≥22	2.26 (2.46)	0.11 (-0.65, 0.89)	0.29 (192)	0.772
Gender	Male	2.34 (2.37)			
	Female	2.28 (2.75)	-0.06 (-0.83, 0.71)	-0.16 (192)	0.875
	Malay	1.64 (2.49)			
Ethnicity	Chinese	2.21 (2.15)			
	Indian	2.80 (2.85)		1.85 (3, 190)	0.138
	Others	2.48 (2.97)			
Nationality	Malaysian	2.30 (2.59)			
	International	2.33 (2.97)	0.04 (-1.35, 1.43)	0.05 (192)	0.958

Based on the age of the participants, those below 22 years had a higher mean score of 2.37 (SD=2.88) and those 22 and above had a mean score of 2.26 (SD=2.46). The mean difference was 0.11 and 95% confidence interval ranged from -0.65 to 0.89, where the t value was 0.29 (df=192), however the P value is 0.772 which shows that there is no significant association between age and goal setting. Meanwhile, male students scored a higher mean value of 2.34 (SD=2.37) compared to the female students that scored a mean of 2.28 (SD=2.75). The mean difference was -0.06 with 95% confidence interval of -0.83 to 0.71, t value was -0.16 (df=192), P value was 0.875 which proved no significant association between gender and

goal setting. As for ethnicity, Indian had the highest score of 2.80 (SD=2.85) followed by 'Others' with mean score of 2.48 (SD=2.97), Chinese with mean score of 2.21 (SD=2.15) and lastly Malay with mean score of 1.64 (SD=2.49). The F Statistical value obtained was 1.85 (df=3,190), the P value however was not significant (P=0.138). Moreover, Malaysian students had a lower mean score of 2.30 (SD=2.59) compared to the International students that had a mean score of 2.33 (SD=2.97). The mean difference was -1.35 to 1.43, with t value of 0.05 (df=192) and P value of 0.958 which showed no significance. Hence age, gender, ethnicity and nationality showed no significant association with goal setting.

Table 5. Association between socio-demographic data and application of knowledge and skills.

Variables	Categories	Application of knowledge and skills mean (SD)	Mean Difference (95% CI)	t (df)/F (df1,df2)	P value
Age (years)	<22	2.70 (1.43)	0.42 (-0.03, 0.87)	1.83 (192)	0.070
	≥22	2.28 (1.59)			
Gender	Male	2.54 (1.46)	-0.16 (-0.61, 0.29)	-0.70 (192)	0.484
	Female	2.37 (1.59)			
Ethnicity	Malay	2.02 (1.41)	0.83 (0.02, 1.64)	6.03 (3, 190)	0.001
	Chinese	2.04 (1.45)			
	Indian	2.77 (1.64)			
Nationality	Others	3.17 (1.31)	2.02 (192)	0.044	
	Malaysian	2.37 (1.54)			
	International	3.20 (1.32)			

For the second domain of lifelong learning; application of knowledge and skills, students who were under 22 years old had a mean score of 2.70 (SD=1.43) while 22 and above had a mean score of 2.28 (SD=1.59). The mean difference was 0.42 with 95% confidence interval ranging from -0.03 to 0.87 and t value of 1.83 (df=192). However, the P value obtained showed no significant association (P=0.070). Furthermore, male had obtained a mean score of 2.54 (SD=1.46) while female had obtained a mean score of 2.37 (SD=1.59) with a mean difference of -0.16 and 95% confidence interval of -0.61 to 0.29. The t value was -0.70 (df=192) and P value was 0.484 which showed no significance. As for ethnicity, 'Others' had the highest mean value for application of knowledge and skills with the mean of 3.17 (SD=1.31) followed by Indian with the mean score of 2.77 (SD=1.64),

Chinese with the mean score of 2.04 (SD=1.45) and lastly Malay with the mean score of 2.02 (SD=1.41). The mean difference was 0.83 with 95% confidence interval of 0.02 to 1.64 and ANOVA value of 2.02 (df=192). The P value was 0.001 which proved that ethnicity is associated with application of knowledge and skills. Finally, Malaysian had a mean score of 2.37 (SD=1.54) while International students scored a mean of 3.20 (SD=1.32). Mean difference was 0.83 and 95% confidence interval of 0.02 to 1.64. The t value was 2.02 (df=192) with P value of 0.044 which showed significant association. In conclusion, ethnicity and nationality has significant association with application of knowledge and skills whereas age and gender proved to not be associated with application of knowledge and skills.

Table 6. Association between socio-demographic data and self-direction and evaluation.

Variables	Categories	Self-direction and evaluation mean (SD)	Mean Difference (95% CI)	t (df)/F (df1,df2)	P value
Age (years)	<22	1.29 (1.50)	0.34 (-0.08, 0.77)	1.59 (192)	0.113
	≥22	0.94 (1.40)			
Gender	Male	0.80 (1.53)	0.42 (-0.005, 0.840)	1.95 (192)	0.053
	Female	1.22 (1.38)			
Ethnicity	Malay	0.83 (1.22)	0.07 (-0.70, 0.84)	4.22 (3, 190)	0.007
	Chinese	0.67 (1.35)			
	Indian	1.39 (1.66)			
Nationality	Others	1.55 (1.21)	0.18 (192)	0.854	
	Malaysian	1.06 (1.48)			
	International	1.13 (0.92)			

In the self-direction and evaluation domain, students below 22 years of age scored a mean of 1.29 (SD=1.50) while those who were 22 and above had a mean score of 0.94 (SD=1.40) with the mean difference of 0.34 and 95% confidence interval of -0.08 to 0.77. The t value acquired was 1.59 (df=192) and P value showed no significant association (P=0.113). In addition, female had a higher mean score of 1.22 (1.38) compared to male with a mean score of 0.80 (1.53). The mean difference was 0.42 with 95% confidence interval of -0.005 to 0.840 and t value of 1.95 (df=192). The P value acquired was 0.053 which exhibit no significant association to self-direction and evaluation. As for ethnicity, 'Others' had the highest mean score of 1.55 (SD=1.21) followed by Indian with the mean value of 1.39 (SD=1.66),

Malay with the mean score of 0.83 (SD=1.22) and lastly Chinese with the mean score of 0.67 (SD=1.35). The ANOVA value acquired was 4.22 (df=3,190) and the P value was 0.007 which exhibit a significant association. Finally, Malaysian obtained a mean score of 1.06 (SD=1.48) compared to International students with the mean score of 1.13 (SD=0.92). The mean difference was 0.07 with 95% confidence interval of -0.70 to 0.84 and t value of 0.18 (df=192). The P value obtained showed no significant association (P=0.854). To conclude, only ethnicity has a significant association to self-direction and evaluation as compared to other socio-demographic data such as age, gender and nationality which proved no significance in association.

Table 7. Association between socio-demographic data and locating information.

Variables	Categories	Locating information mean (SD)	Mean Difference (95% CI)	t (df)/F (df1,df2)	P value
Age (years)	<22	0.26 (1.11)	0.20 (-0.12, 0.52)	1.24 (192)	0.218
	≥22	0.06 (1.07)			
Gender	Male	0.01 (1.16)	0.181 (-0.138, 0.5002)	1.12 (192)	0.265
	Female	0.20 (1.04)			
Ethnicity	Malay	-0.15 (1.08)	2.56 (3, 190)	0.057	
	Chinese	0.12 (1.07)			
	Indian	0.15 (1.06)			
	Others	0.55 (1.09)			
Nationality	Malaysian	0.11 (1.07)	0.22 (-0.36, 0.798)	0.76 (192)	0.449
	International	0.33 (1.29)			

The table above shows the association between the socio-demographic data and one of the lifelong learning domains such as locating information. Those that were younger than 22 years old had a higher mean value of 0.26 (SD = 1.11) compared to those that were 22 years old and older that had a mean of 0.06 (SD = 1.07) in this domain. The mean difference between these two categories was 0.20 with a 95% confidence interval of -0.12 to 0.52 and t value of 1.24 (df = 192). This variable has a P value that is more than 0.05 which shows there is no significant association between age and locating information. Next, the male participants had a lower mean value of 0.01 (SD = 1.16) compared to the female participants that had a mean value of 0.20 (SD = 1.04) in this domain. The mean difference resulted in a value of 0.181 with a 95% confidence interval of -0.138 to 0.5002 and t value of 1.12 (df = 192). In this variable, the P value was 0.265 which was more than 0.05, this meant that there was no significant association between the gender and this domain. Furthermore, 4 ethnicities were involved in this study such as

Malay, Indian, Chinese and Others. The 'other' category had the highest mean value of 0.55 (SD = 1.09), followed by Indians with a mean value of 0.15 (SD = 1.06), Chinese with a mean of 0.12 (SD = 1.07) and Malay with a mean of -0.15 (SD = 1.08). The F Statistic value was 2.56 (df1 = 3, df2 = 190). This variable had a P value of 0.057 which was more than 0.05, this meant that there was no significant association between the ethnicities and locating information. Lastly, the Malaysians had a lower mean value of 0.11 (SD = 1.07) compared to the International students with a mean of 0.33 (SD = 1.29) in this domain. The mean difference between these 2 categories in this variable was 0.22 with a 95% confidence interval ranging from -0.36 to 0.798 and t value of 0.76 (df=192). The P value in this variable was 0.449 which was higher than 0.05, this meant that there was no significant association between nationality and this domain in lifelong learning. Hence, none of the socio-demographic data showed significant association with this lifelong learning domain, locating information.

Table 8. Association between socio-demographic data and adaptable learning strategies.

Variables	Categories	Adaptable learning strategies mean (SD)	Mean Difference (95% CI)	t (df)/F (df1, df2)	P value
Age (years)	<22	0.59 (1.78)	0.30 (-0.23, 0.82)	1.11 (192)	0.270
	≥22	0.29 (1.79)			
Gender	Male	0.87 (1.83)	-0.75 (-1.27, -0.24)	-2.87 (192)	0.005
	Female	0.12 (1.71)			
Ethnicity	Malay	-0.15 (1.68)	2.23 (3, 190)	0.087	
	Chinese	0.44 (1.82)			
	Indian	0.59 (1.94)			
	Others	0.79 (1.37)			
Nationality	Malaysian	0.35 (1.82)	0.58 (-0.37, 1.53)	1.21 (192)	0.227
	International	0.93 (1.22)			

The table above shows the association between the socio-demographic data and one of the lifelong learning domains such as adaptable learning strategies. The participants that were below 22 years old had a higher mean value of 0.59 (SD = 1.78) compared to the participants that were 22 years old and older which had a mean of 0.29 (SD = 1.79) in this domain. The mean difference between these 2 categories are 0.30 with a 95% confidence interval ranging from -0.23 to 0.82 and t value of 1.11 (df = 192). The P value in this

variable is 0.270 which is higher than 0.05, this meant that there was no significant association between age and adaptable learning strategies. Next, the male participants had a higher mean value of 0.87 (SD = 1.83) compared to the female participants that had a value of 0.12 (SD = 1.71) in this lifelong learning domain. The mean difference between these 2 categories was -0.75 with a 95% confidence interval ranging from -1.27 to -0.24 and t value of -2.87 (df = 192). In this variable, there was a P value of 0.005 that was lower

than 0.05 which meant that there is a significant association between gender and adaptable learning strategies. Moreover, between the 4 ethnical categories, the 'Other' category had the highest mean value of 0.79 (SD = 1.37), followed by Indian with a mean value of 0.59 (SD = 1.94), Chinese with a mean of 0.44 (SD = 1.82) and Malay with a mean of -0.15 (SD = 1.68). The F Statistic value is 2.23 (df1 = 3, df2 = 190). The P value was 0.087 which was more than 0.05, this meant that there was no significant association between ethnicity and adaptable learning strategies. Lastly, the Malaysian nationality had a lower mean value of 0.35 (SD =

1.82) compared to the International students that had a mean value of 0.93 (SD = 1.22). The mean difference between these 2 categories was 0.58 with a 95% confidence interval of -0.37 to 1.53 and t value of 1.21 (df = 192). The P value in this variable was 0.227 which was higher than 0.05, this meant that there was no significant association between nationality and adaptable learning strategies. To conclude, only gender proves to have a significant association with adaptable learning strategies as compared to the other socio-demographic data such as age, ethnicity and nationality.

Table 9. Association between socio-demographic data and total lifelong learning score.

Variables	Categories	Total lifelong learning score mean (SD)	Mean Difference (95% CI)	t (df)/F (df1,df2)	P value
Age (years)	<22	7.20 (6.00)			
	≥22	5.83 (4.90)	1.37 (-0.19, 2.94)	1.72 (192)	0.087
Gender	Male	6.56 (5.93)			
	Female	6.19 (5.00)	-0.38 (-1.95, 1.20)	-0.47 (192)	0.638
Ethnicity	Malay	4.19 (4.34)			
	Chinese	5.47 (5.13)			
	Indian	7.70 (5.77)		6.52 (3, 190)	0.001
	Others	8.55 (4.88)			
Nationality	Malaysian	6.19 (5.37)			
	International	7.93 (4.89)	1.74 (-1.09, 4.57)	1.21 (192)	0.226

The table above shows the association between the socio-demographic data and the total lifelong learning score. The participants that were aged below 22 years old had a higher mean value of 7.20 (SD = 6.00) compared to the participants that were aged 22 years old and older which had a mean of 5.83 (SD = 4.90). The mean difference between these two categories was 1.37 with a 95% confidence interval of -0.19 to 2.94 and a t value of 1.72 (df = 192). The P value was 0.087 which is higher than 0.05, this meant that there was no significant association between age and total lifelong learning score. Next, the male participants had a higher mean value of 6.56 (SD = 5.93) compared to the female participants which had a mean value of 6.19 (SD = 5.00). The mean difference between these 2 categories is -0.38 with a 95% confidence interval of -1.95 to 1.20 and a t value of -0.47 (df = 192). The P value in this variable was 0.638 which is higher than 0.05, this meant that there was no significant association between gender and total lifelong learning score. Furthermore, between

the 4 ethnical categories, the 'Other' category had the highest mean value of 8.55 (SD = 4.88), followed by Indian with a mean of 7.70 (SD = 5.77), Chinese with a mean of 5.47 (SD = 5.13) and Malay with a mean of 4.19 (SD = 4.34). The F Statistical value was 6.52 (df1 = 3, df2 = 190). The P value was 0.001 which is lower than 0.05, this meant that there was a significant association between ethnicity and total lifelong learning score. Lastly, Malaysians had a lower mean value of 6.19 (SD = 5.37) compared to the International students which had a mean of 7.93 (SD = 4.89). The mean difference between these 2 categories was 1.74 with a 95% confidence interval of -1.09 to 4.57 and a t value of 1.21 (df = 192). The P value was 0.226 which is higher than 0.05, this meant that there was no significant association between nationality and total lifelong learning score. Hence, only ethnicity showed a significant association with total lifelong learning score as compared to the others such as age, gender and nationality which had no significant association to this domain.

Table 10. Association between empathy, self-efficacy and lifelong learning.

Lifelong Learning	Total score correlation coefficient (r)	Goal setting correlation coefficient (r)	Application of knowledge and skills correlation coefficient (r)	Self-direction and evaluation correlation coefficient (r)	Locating information correlation coefficient (r)	Adaptable learning strategies correlation coefficient (r)
Empathy	0.361***	0.224**	0.361***	0.265***	0.200**	0.141*
Self-Efficacy	0.447***	0.361***	0.316***	0.361***	0.224**	0.141

P value = * < 0.05; ** < 0.01; *** < 0.001

The table above shows the association between empathy, self-efficacy and lifelong learning. The correlation coefficient, r between empathy and total lifelong learning

score was 0.361. It shows a positive correlation which means when empathy increases, the lifelong learning tendency will also increase. This value also shows that there is a low

correlation between these two variables. The P value is <0.001 which meant that it is a very significant association between empathy and total lifelong learning score. In the first domain of lifelong learning which is goal setting, the correlation coefficient, r between empathy and this domain was 0.224. It shows a positive correlation which means when empathy increases, there is increase in the goal setting domain. This value also projects that there is little if any correlation between these two variables. The P value is <0.01 which meant that it is a moderately significant association between empathy and goal setting. Next, the correlation coefficient, r between empathy and application of knowledge and skills was 0.361. It shows a positive correlation which means when empathy increases, the application of knowledge and skills will also increase. This value also shows that there is low correlation between these 2 variables. The P value is <0.001 which meant that there is a very significant association between empathy and application of knowledge and skills. In the third domain of lifelong learning which is self-direction and evaluation, the correlation coefficient, r between empathy and this domain was 0.265. It shows a positive correlation which meant that when empathy increases, there is an increase in self-direction and evaluation. This value also shows that there is little if any correlation between these two variables. The P value was <0.001 which meant that there is a very significant association between empathy and self-direction and evaluation. Furthermore, in the fourth domain which is locating information, the correlation coefficient, r between empathy and this domain was 0.200. It shows a positive correlation which means when empathy increases, the tendency to locate information increases. This value also shows that there is little if any correlation between these two variables. The P value is <0.01 which meant that there is a moderately significant association between empathy and locating information. In the fifth domain of lifelong learning which is adaptable learning strategies, the correlation coefficient, r between empathy and this domain was 0.141. It shows a positive correlation which meant that when empathy increases, there is an increase in adaptable learning strategies. This value also shows that there is little if any correlation between these two variables. The P value is <0.05 which meant that there is a significant association between empathy and adaptable learning strategies. Hence, empathy has positive association with lifelong learning and its domains. It also has a significant association with lifelong learning and its domains.

The correlation coefficient, r between self-efficacy and total lifelong learning score was 0.447. It shows a positive correlation which means when self-efficacy increases, the lifelong learning tendency will increase. This value also shows that there is low correlation between these two

variables. The P value is <0.001 which meant that it is a very significant association between self-efficacy and total lifelong learning score. In the first domain of lifelong learning, which is goal setting, the correlation coefficient, r between self-efficacy and this domain was 0.361. It shows a positive correlation which meant when self-efficacy increases, there is an increase in goal setting. This value shows a low correlation between these two variables. The P value was <0.001 which shows a very significant association between self-efficacy and goal setting. Next, the correlation coefficient, r between self-efficacy and application of knowledge and skills was 0.316. It shows a positive correlation which meant that when self-efficacy increases, there is an increase in application of knowledge and skill. This value also projects a low correlation between these two variables. The P value was <0.001 which shows a very significant association between self-efficacy and application of knowledge and skills. Moreover, in the third domain which is self-direction and evaluation, the correlation coefficient, r between self-efficacy and this domain was 0.361. It shows a positive correlation which meant that when there is an increase in self-efficacy, there will also be an increase in self-direction and evaluation. This value shows low correlation between these two variables. The P value was <0.001 which shows a very significant association between self-efficacy and self-direction and evaluation. In the next domain, which is locating information, the correlation coefficient, r between self-efficacy and this domain was 0.224. It is a positive correlation which meant that when self-efficacy increases, there is an increase in locating information. This value shows little if any correlation between the two variables. The P value was <0.01 which meant there was a moderately significant association between self-efficacy and locating information. Lastly, the correlation coefficient, r between self-efficacy and adaptable learning strategies was 0.141. It shows a positive association which meant that when self-efficacy increases, there is an increase in adaptable learning strategies. This value shows little if any correlation between these two variables. The P value shows that there was no significant association between self-efficacy and adaptable learning strategies.

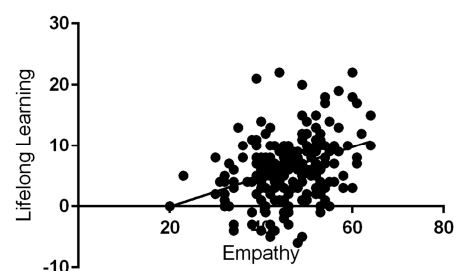


Figure 1. The association between Empathy and Lifelong Learning.

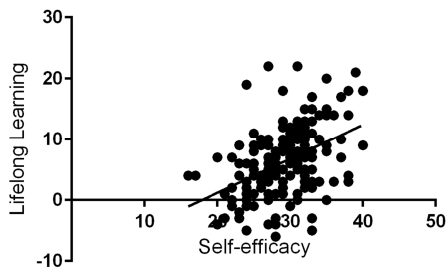


Figure 2. The association between Self-efficacy and Lifelong Learning.

4. Discussion

A cross-sectional study was done to assess the level of empathy, level of lifelong learning, the association between empathy and lifelong learning and the association between the other variables such as self-efficacy and gender in relation to lifelong learning among clinical year medical students in Melaka-Manipal Medical College. We assessed lifelong learning of the students using The Lifelong Learning Questionnaire which was developed by John R. Kirby, Christopher Knapper, Patrick Lemon and William J. Egnatoff. The questionnaire consisted of 14 items that was further divided into 5 domains (goal setting, application of knowledge and skills, self-direction and evaluation, locating information and adaptable learning strategies). The mean for application of knowledge and skills was the highest among all domains (mean 2.43), followed by goal setting (mean 2.30), self-direction and evaluation (mean 1.07), adaptable learning strategies (mean 0.40) and lastly, locating information (mean 0.13). A previous study was conducted in the Malaysia Institute of Higher Learning Context had shown that the mean for goal setting was the highest among all the other domains (mean 2.69), followed by application of knowledge and skills (mean 2.61), adaptable learning strategies (mean 0.44), self-direction and evaluation (mean 0.25) and lastly locating information (mean -0.16). [23]

Empathy was assessed by the Toronto Empathy Scale which consisted on 16 items. The mean of the total score in our study was 45.98. However, in another study that was conducted to see the empathic concern and professional characteristics associated with clinical empathy in French general practitioners, the mean value was 45.9. [30] Furthermore, self-efficacy was also measured by utilizing the The New General Self-Efficacy Scale (NGSE) by (Chen, Gully & Eden, 2001). The mean value in our study for self-efficacy among the students was 29.15.

Next, in this study, we determined the association between sociodemographic variables and lifelong learning. We found that there was no significant association between age, gender, ethnicity, nationality and lifelong learning in both the goal setting and locating information domain. However,

ethnicities had a significant association with a lifelong learning domain such as the application of knowledge and skills. Among different ethnicities, 'others' ethnic group had highest score followed by Indian, Chinese and Malay. Ethnicity had another significant association with lifelong learning such as in the self-direction and evaluation domain. Out of all the different ethnicities present, the 'others' group had the highest score followed by Indian, Malay and Chinese. The previous study done in the United States of American showed that ethnicity had some relation to lifelong learning. This study concluded that White adults had a higher engagement of 65% in professional learning while the African-American and Hispanic had 59% and 52% respectively. [31]

Nationality also had a significant association with the same lifelong learning domain, application of knowledge and skills with International students being the highest in mean value followed by Malaysian students. A previous study done in United Arab Emirates was in relation to nationality, it was to determine the learner's readiness for lifelong learning in order to support their language development. It was concluded that Turkish learners had a higher mean value of 119.53 compared to the Emirati learners which had a mean value of 107.43. [32]

Moreover, in relation to the total lifelong learning score which includes all 5 domains, ethnicity had a significant association with the 'other' category being the highest following by Indian, Chinese and Malay.

Next, gender had a significant association with the lifelong learning domain, adaptable learning strategies. The males had a higher score in comparison to the female in this study. Furthermore, in relation to gender and lifelong learning, a study in Universiti Kebangsaan Malaysia was conducted and it had shown that female students had a stronger tendency towards lifelong learning with a mean value of 0.51 compared to male students with a mean value of 0.29. [23]

Our research also aimed on the association between lifelong learning and empathy. As indicated in the analysis, there are significant positive correlations between empathy and lifelong learning. Previous study in Turkey which was conducted amongst pre-clinical students has shown that the students' empathy score were low as well as their lifelong learning score. However, there were no studies that proved the association between the two variables. [13]

Another important finding was that the correlation between lifelong learning and self-efficacy also yielded significant positive correlations except adaptable learning strategies, which showed no significant association. Based on a study carried out in Turkey amongst Computer Education and Instructional Technologies (CEIT) pre-service teachers, self-

efficacy and lifelong learning had a positive significant association though it was a weak association. The weak relation shown might have been due to Turkish culture whereby people with higher self-efficacy are more established in terms of professional learning. [33]

Life-long learning has taken precedence in the 21st century and will continue to do so in the coming years seeing as how it is vital in the development of human capital. Therefore, it is paramount that the tendency to become life-long learners is instilled among medical undergraduates seeing as how healthcare is a constantly evolving field. One of the ways to promote life-long learning among students is to first make them aware of such a concept and understand what it entails. Learning institutions need to play a role by continuously reminding the students about the importance of life-long learning through various programs such as self-directed learning and problem based learning. The curriculum design and assessment should also be related to current practices to maintain relevancy and suitability. Besides, institutions should also provide more accessible and adequate self-study resources. [34, 35]

This study design has a few limitations. Firstly, there was a low response in participation from the medical students in the final year students as they were not approached directly but instead were provided with a Google Form to answer the survey. The total number of students in the final year students that responded were not sufficient to be representative to each semester as a whole respectively. Another limitation of the study includes selection bias by which only students from Semester 6 and 7 were approached directly and were given priority due to setting and time convenience. There was difficulty to determine the temporal relationship between the variables being measured. It also cannot be used to observe any sort of changes regarding this study over time. Moreover, this study could not be generalized among other medical students in different settings and in different colleges.

The findings and issues raised by the current study indicates several possible avenues for future research. Since the current study employed purposive sampling technique, the number of 4th year medical student respondents far outweighs the number of 5th year medical student respondents. Therefore, it is not feasible to make a fair and accurate comparison between these groups. Future research should ensure a more distributed participation from students across semesters. Since the research participants are only confined to the students of one institution, there is also a problem with generalizability so it cannot be applied to students in other universities. To combat this problem, future research should have other students from various universities to participate.

5. Conclusion

In conclusion, there is no significant association between any of the socio-demographic data and goal setting. However, there is significant association between ethnicity and nationality with application of knowledge and skills. It seems that other ethnicities and foreign students are more able to impose meaning upon what others see as disorder, relating academic learning to practical issues and when they approach new material, they try to relate it to what they know. There is also a significant association between ethnicity with self-direction and evaluation. The other ethnicities outside of the Malays, Chinese and Indians seemed to have a higher sense of responsibility when it comes to making sense of what they learned at school. No significant association can be found between any of the socio-demographic data with location information. There is significant association between gender and adaptable learning strategies. Males prefer problems for which there is only one solution and can deal with the unexpected and solve problems when they arise when compared to females. It is shown that there is a very significant association between lifelong learning and empathy in which all 5 subdomains in the lifelong learning scale shows a significant association with empathy. The same could be said for self-efficacy but only one subdomain in the lifelong learning scale has no significant association with self-efficacy and that is adaptable learning strategies. All in all, as empathy and self-efficacy is higher among students, there will also be a higher tendency for lifelong learning.

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