ORIGINAL ARTICLE

Physiotherapy Faculty Members and Students Readiness with Interprofessional Education

Umasenan Thanikasalam[1]

[1] Asia e University, Malaysia

ABSTRACT

Background: This study assessed readiness of faculty members and undergraduate physiotherapy students towards interprofessional education. **Methods:** A cross sectional survey with simple random purposive sampling was used for this study. The Readiness for Interprofessional Learning Scale (RIPLS) was administered to participating physiotherapy faculty members' and students. Data were analysed using descriptive statistics while the correlation based on the faculty members and students' gender, level of study and year of study were identified using inferential statistics. **Results:** This study enlisted 37 faculty members and 92 physiotherapy students, and the response rate was 100%. The p-value was > 0.05, indicating that there was a significant difference in faculty and physiotherapy students' readiness for interprofessional education. Faculty members reported lower readiness (M = 61.05, SD = 17.98) than students (M = 74.93, SD = 6.20). There was no correlation, significant between the student's gender, level of study, or year of study and their readiness for interprofessional education, as all the p-values were < 0.05. Diploma students were reported as being more ready than degree students, female students showed more readiness than male students and third year students reported more readiness than the other year students for interprofessional education. **Conclusion:** Malaysian physiotherapy students showed a higher interest in interprofessional education as compared to their faculty members. This, however, are merely a gauge of preparation prior to the start of a formal interprofessional academic session. To promote interprofessional activities, more research on physiotherapy personnel is encouraged. The findings of this study have offered a focal point for developing Interprofessional learning practices between the physiotherapy department and the university's other health departments.

Keywords: Interprofessional education, readiness, physiotherapy

Corresponding Author:
Umasenan Thanikasalam
Email: ustm20@gmail.com
Tel: +616-3438282

INTRODUCTION

Physiotherapists are trained to make decisions and act autonomously within a professional environment, and is responsible and accountable for those decisions and actions (Sedgley 2013). Explained professional autonomy or clinical reasoning in physiotherapy is defined as the thinking and decision-making processes related with clinical practice (Higgs, Refshauge & Ellis 2001). Clinical reasoning necessitates the ability to critically evaluate practice, learn from experience, and adapt what has been learned to new situations. It is the connection between a physiotherapist's knowledge, ability to gather, analyse, and synthesize pertinent data and personal awareness, self-monitoring, and reflecting processes (Smith, Ajiawi & Jones 2009).

Physiotherapists are educated to be self-sufficient, but when they enter the healthcare industry, they are compelled to work collaboratively in teams (Rose et al. 2009). Malaysian healthcare is delivered through multidisciplinary teams. Healthcare workers must be able to work as part of a multidisciplinary team in order to provide high-quality patient care. Despite the fact that Malaysian healthcare is multidisciplinary, healthcare students are underprepared (Tong et al. 2016).

Integrating teamwork and communication is critical for health care workers to provide excellent patient care (Boland et al. 2016). It is critical for newly graduated students to become proficient in their abilities and to deliver safe and effective care regardless of the increased obligations. Despite growing obligations, responsibilities, and problems, new graduates must master their professional abilities (Boland et al. 2016). The willingness of learners and academics was identified as a crucial aspect in interprofessional learning's acceptability and execution (Ernawati & Utami 2020). Health education serves as the foundation for the evolution of the healthcare profession in the industry, with health institutes bearing primary responsibility for the development of critical abilities such as collaboration (Interprofessional Education Collaborative Expert Panel 2011).

Recent advancements in healthcare have driven a strong push for the integration of multiple healthcare professionals in the delivery of patient care. The Malaysian government backed this up by enacting the Allied Health Act 2016, which formalizes the allied health profession so that healthcare practitioners' patient care can be properly supervised. Physiotherapy was added to the list of professions in the allied health legislation of 2016, which takes effect in 2020. Doctors, dentists, veterinarians, nurses, medical assistants, and pharmacists were previously the only professions governed by the Malaysian legislation. Physiotherapy's admission as an allied health profession outlined the importance of the profession's contribution to the healthcare industry and their importance in healthcare teams.

One of the challenges in bringing physiotherapy together with diverse healthcare professions is that professionals may have difficulty working together in an integrated manner unless they have been trained to do so (Jones et al. 2012). Other challenges include limited access to other healthcare disciplines, lack of adequate clinical training sites, poor administrative support, insufficient resources for faculty development, lack of standardized assessment instruments, and attitudinal differences and scheduling conflicts (Jones et al. 2012; Maniall & Rowe 2016). Working in a collaborative atmosphere necessitates clarity, particularly when it comes to border crossing (Horsburgh, Lamdin & Williamson 2001; Manilall & Rowe 2016). Miscommunication among healthcare providers has a negative impact on both healthcare delivery and patient care (Manilall & Rowe 2016). The World Health Organization (WHO) suggested interprofessional education as a solution to these challenges (WHO 2010; WHO 2013).

Interprofessional education is a collaborative strategy for educating healthcare students to work as effective future members of interprofessional teams (Buring et al. 2009; Olenick, Allen & Smego 2010). Interprofessional education is also encouraged by the Institute of Medicine (IOM), the Canadian Interprofessional Collaborative (CIHC), the European Interprofessional Education Network, The UK Center for Advancement of Interprofessional Education (CAIPE) and supported locally by the Malaysian, Ministry of Health (MOH) and Malaysian Qualifying Agency (MQA).

Despite the Malaysian government's efforts to promote collaboration in the healthcare industry, healthcare education is lacking interprofessional execution (Shoesmith et al. 2016; Tong et al. 2016). Collaborative education is often provided as an extra-curricular activity or an elective rather than as a core competency subject (Tong et al. 2016). Multidisciplinary education was also included in the Malaysian Qualifying Agency's (MQA) framework for initiation, guidance, evaluation, and accreditation. To date, no formal application has been filed in relation to multidisciplinary education. There has been little research on how therapy professionals see interprofessional collaboration because the majority of Interprofessional studies centred on doctors and nurses (De Vries et al. 2016).

There is, however, a lack of clarity about how health professions instructors may create and assess collaborative competency in undergraduate healthcare students. Healthcare education has not kept pace with the demands of struggling health systems, prompting calls for educational changes to create graduates with suitable professional capabilities. This is demonstrated by the fact that various professions do not effectively collaborate, probably because of poor core competency development in undergraduate education (WHO 2013).

It appears that the ability to interact effectively must be actively taught in undergraduate health professions curriculum if healthcare practitioners are to handle the increasingly complicated health requirements of their client populations. Furthermore, interprofessional education appears to be a suitable location within the curriculum to include the development of collaboration as a fundamental ability. However, there is little data on how this vital skill is fostered in students studying health professions (Horsburgh, Lamdin & Williamson 2001). The goal of this research was to see how students and professors in a physiotherapy department thought about the development of collaborative competency in the undergraduate curriculum.

In Malaysia, studies of healthcare programs and participants pertaining to multidisciplinary treatment indicated a dearth of physiotherapy participation. Although multidisciplinary education is recognized as collaborative education, in many cases the term interprofessional education is used. According to the World Health Organization (WHO), interprofessional education is an experience that “occurs when students from two or more professions learn about, from, and with each other” (WHO 2010). Till then the term interprofessional education had been popularly conceptualized.

Only a study by Ismail and colleagues that included physiotherapy as a participant was retrieved from the literature. They found that among the healthcare students surveyed on their readiness for interprofessional education, the physiotherapy students had the highest readiness (Ismail et al. 2018). There were no physiotherapy-related follow-up studies found. Most healthcare studies, focused on medical, nursing, and pharmacy students (Aziz, Teck & Yen 2011); dentistry, nursing, pharmacy and health sciences (Maharajan et al. 2017); pharmacy students (Tahir 2020); dentistry and medical students (Htay et al. 2019).

Two studies on interprofessional education were reported among faculty members. One looked at a government university (Chelliah, Efendie & Mohamad 2015), while the other one looked at private university faculty members (Thanikasalam 2017).

Faculty members, according to Chelliah and colleagues, have a high level of readiness for interprofessional education. However, it is unclear which faculty members were interested in interprofessional education based on

the findings of this study (Chelliah, Efendie & Mohamad 2015). In the meantime, Thanikasalam found that faculty members' readiness on interprofessional education varied. The study did not look into how physiotherapy faculty members interacted with interprofessional education (Thanikasalam 2017).

As a result, depending on different studies to back up research findings can be perplexing. By focusing entirely on physiotherapy students and faculty members, this study intends to clear up any uncertainty that has arisen. This will aid in determining physiotherapy professionals' readiness levels and initiating interprofessional efforts within the physiotherapy academic curriculum.

MATERIALS AND METHODS

Study design

The purpose of this research was to look into the relationship between physiotherapy students and faculty members with readiness for interprofessional education. The university's research committee granted permission for this study to be conducted. The university was considered as the university that met the research requisites proposed in previous studies (Marshall & Rossman 2006).

Upon approval, an ex post facto, non-experimental design was selected. An ex post facto research design was found to be suitable in measuring relationship variables (Newman & Benz 1998). A non-experimental design was chosen as the independent variables in this study cannot be manipulated (Newman et al. 2006).

For this study, a survey method was used. A survey method was considered since a standardized response was required to determine the participants' degrees of readiness response. The answer will be able to assist in the development of a framework for interprofessional implementation activities at the university. If a qualitative approach is taken, divergent viewpoints will serve to delay the interprofessional initiative because triangulating each participant's Interprofessional response necessitates careful interpretation.

Study samples & procedure

A simple random, purposive sample technique was used to select the faculty members and physiotherapy students for this study. The anticipated sample size was calculated using the population calculation developed by Krejcie and Morgan (1970).

All of the participants signed a written informed consent form and met the inclusion criteria. Full-time students entering the physiotherapy programme with no prior experience with interprofessional education and no academic papers other than physiotherapy were the inclusion criteria. In terms of lecturers, this study looked at full-time instructors as well as lecturers who only teach the physiotherapy programme.

A survey instrument was developed for this research. The instrument was made up of two sections. Section A contained the participants' socio-demographic information, such as gender, educational level, and level of study for the students. The Readiness of Interprofessional Education Scale (RIPLS) by Parsell et al. (1999) was included in Section B and applicable to the students and faculty members (permission for the use of this questionnaire was acquired beforehand). With an internal validity of 0.9 during the pilot study and a recommendation from Malaysian researchers, Aziz and colleagues, the RIPLS was well on its way to meeting this study objective (Aziz, Teck & Yen 2011).

The students and faculty members were given the questionnaire face-to-face. This was necessary because feedback from students and faculty members might be used to improve the university's Interprofessional efforts. The purpose of the study was explained to the participants. The participants were not compelled to take part in the study. Participants were advised that if they did not feel comfortable with the study, they could withdraw. The study was completed by all participants, and the response rate was 100%.

Data analysis

The data was analysed with descriptive and inferential statistics using the Statistical Package for Social Sciences (SPSS) (v.20). To test the relationships, descriptive, mean, and correlation statistical approaches were used.

RESULTS

Demography

In this study 37 faculty members and 92 physiotherapy students were recruited. Among the 92 physiotherapy students, male students account for 19 (20.7%), while female students account for 73 (79.3%). In the level of program, there were 36 (39.1%) diploma students and 56 (60.9%) degree students. In the category of year of study; 18 (19.6%) were first year; 24 (26.1%) were second year; 32 (34.8%) were third year; and 18 (19.6%) were fourth year students.

Statistical tests results

A T-Test was performed to see if the variable designation was significant using RIPLS and its subscales. The variable designation was found to be significant using the RIPLS and its subscales, as $p < 0.05$. Table I shows the overall RIPLS score and each of the RIPLS subscales for the faculty members and students. Overall, both faculty and students reported a differing readiness level. The faculty members reported a lower readiness ($M = 61.05$, $SD = 17.98$) than the students ($M = 74.93$, $SD = 6.20$) who reported a high readiness. Faculty members had also rated themselves low than students in terms of teamwork and collaboration, positive identity, and roles and responsibilities. Faculty members also expressed a higher level of negative identity than students.

Table I: Mean score for faculty members and students for RIPLS and its subscales

Readiness for Interprofessional Learning Scale (RIPLS)	Designation		*p-value*
	Faculty (mean ± SD)	Students (mean ± SD)	
Overall	61.05 (17.98)	74.93 (6.20)	0.00*
Teamwork and collaboration	28.32 (8.88)	38.33 (3.86)	0.00*
Negative identity	9.92 (3.03)	8.36 (1.28)	0.00*
Positive identity	12.78 (3.86)	17.30 (2.19)	0.00*
Roles and responsibility	10.03 (2.95)	10.95 (1.31)	0.00*

A T-Test was also utilized to determine whether the level of study had any bearing on the RIPLS and its subscales. According to the test, RIPLS and its subscales had no bearing on level of study, as the p-values were > 0.05. The diploma student had reported a higher readiness, teamwork and collaboration, negative identity, positive identity, and roles and responsibilities than the degree students (Table II). Overall, the diploma and degree students had reported a higher readiness towards Interprofessional Education.

Table II: Mean score for diploma and degree students for RIPLS and its subscales

Readiness for Interprofessional Learning Scale (RIPLS)	Level of Study		*p-value*
	Diploma (mean ± SD)	Degree (mean ± SD)	
Overall	76.89 (5.45)	73.68 (6.36)	0.79
Teamwork and collaboration	39.81 (3.47)	37.38 (3.82)	0.55
Negative identity	8.58 (1.29)	8.21 (1.27)	0.42
Positive identity	17.67 (2.01)	17.07 (2.29)	0.60
Roles and responsibility	10.83 (1.25)	11.02 (1.35)	0.69

The RIPLS and its subscales had no effect on gender, so a T-Test was selected to evaluate if it did. RIPLS and its subscales had no effect on gender, according to the test. All of the p values were > 0.05, indicating that the results were not significant. The diploma student had reported a higher readiness, teamwork and collaboration, negative identity while the degree students had reported a higher positive identity, and roles and responsibilities than the diploma students (Table III). Overall, both genders had reported a higher readiness towards interprofessional education.

An ANOVA test was used to investigate if the RIPLS and its subscales had any effect on the year of study.

Table III: Mean score for male and female students for RIPLS and its subscales

Readiness for Interprofessional Learning Scale (RIPLS)	Gender		*p-value*
	Male (mean ± SD)	Female (mean ± SD)	
Overall	73.74 (6.47)	75.25 (6.13)	0.53
Teamwork and collaboration	38.53 (3.99)	38.27 (3.85)	0.80
Negative identity	8.47 (1.12)	8.33 (1.33)	0.21
Positive identity	16.47 (2.34)	17.52 (2.12)	0.79
Roles and responsibility	10.26 (1.19)	11.12 (1.29)	0.79

The ANOVA test reported RIPLS and its subscales had no effect on the year of study. The p value was > 0.05 for the RIPLS and its subscales, indicating that the outcome was indeed not statistically significant. Mixed results were reported among the year or study (Table IV). The aggregate score indicated that the students were highly ready for interprofessional education.

The third year students reported the highest level of readiness for interprofessional education, while fourth year students reported the lowest level of readiness. Third year students also reported higher levels of teamwork and collaboration, whereas first year students reported the lowest levels. Second year students expressed a more negative identification toward interprofessional education, whereas fourth year students reported a lower negative identity. Students in their third year reported a stronger positive identity, while those in their fourth year reported the lowest positive identity. On the topic of roles and responsibilities, fourth year students scored lower than first year students, who scored higher.

DISCUSSION

The focus of this research was to determine the levels of readiness that physiotherapy faculty members and students had towards interprofessional education. The outcome showed mixed results. With interprofessional education, faculty members reported a low level of readiness, whereas students reported a higher level of readiness.

The faculty members' findings contradicted with the studies by Chelliah et al. (2015) and Thanikasalam (2017) who found that faculty members were highly ready for interprofessional education. In this study, the faculty members highlighted paperwork, time limits,

Table IV: Mean score for year of study for RIPLS and its subscales

Readiness for Interprofessional Learning Scale (RIPLS)	Year of Study				*p-value*
	1st Year (mean ± SD)	2nd Year (mean ± SD)	3rd Year (mean ± SD)	4th Year (mean ± SD)	
Overall	73.72 (7.17)	74.63 (3.3)	77.00 (5.61)	72.89 (8.21)	0.12
Teamwork and collaboration	37.17 (4.51)	37.21 (2.71)	39.72 (3.42)	38.50 (4.60)	0.13
Negative identity	7.83 (1.2)	9.08 (0.77)	8.69 (1.20)	7.33 (1.28)	0.46
Positive identity	17.56 (2.61)	17.04 (1.60)	17.72 (2.08)	16.67 (2.59)	0.39
Roles and responsibility	11.7 (1.29)	11.29 (1.12	10.88 (1.26)	10.39 (1.53)	0.10

and budgetary concerns as impediments to having interprofessional education readiness. Most of the lecturers in this study were foreigners, with some having prior interprofessional experience in their home and working country. They stated that while interprofessional education appears to be simple, it is not realistic to implement. The faculty members' situation was also found to be compatible with other research findings (Chelliah, Efendie & Mohamad 2015; Barr 2015).

This study's findings on the physiotherapy students were consistent with other studies which also reported that physiotherapy students were having high readiness for interprofessional education (Rose et al. 2009; Ismail et al. 2013; Meche et al. 2017). The results of the Malaysian study by Ismail et al. (2018) had contradicted with the studies by Hind et al. (2003) and Manilall and Rowe (2016) who found that physiotherapy students were having low readiness for interprofessional education. These studies attributed dominance from other health professions for their lack of interest with interprofessional education (Hind et al. 2003; Manilall & Rowe 2016). Meanwhile, the physiotherapy students in this study highlighted dorm sharing, cross teaching, and cooperative extracurricular activities as important influences with their high readiness for interprofessional education. This academic scenario had also increased their tolerance and desire to collaborate rather than dominate other professions during studies and practice.

When comparing diploma and degree students, diploma students indicated a better level of readiness for interprofessional education than degree students. Degree students acknowledged being less ready than diploma students since they were exposed to more significant clinical cases in the healthcare industry. Their readiness for interprofessional education had been influenced by this encounter.

Gender was not found to be a predictor of interprofessional education readiness in this study. This finding is supported by a study by Ahmad et al. (2013), who found that gender was also not a predicting factor for interprofessional education readiness. Female students were shown to be more ready for interprofessional education than male students in this study. The results of this study agree with other studies that found females healthcare students were more supportive of interprofessional education (Curran et al. 2008; Coster et al. 2008; Aziz, Teck & Yen 2011; Keshtkaran, Sharif & Rambod 2014; Talwakar et al. 2016). The findings of this study, however, contradict with a study by Htay et al. (2019) who claimed that females were less ready for interprofessional education.

There was no relationship between year of study and readiness in this study. This was also supported by studies by Ahmad et al. (2013) and Chua et al. (2015) which stated that year of study was not a determining element in interprofessional education. The findings of this study contradict studies by Al-Qahtani (2016) and Maharajan et al. (2017) who found that the year of study had an impact on interprofessional education. Despite the fact that the year of study had no effect on readiness in this study, the mean scores varied significantly as the year of study, progressed. The students reported moderate levels of readiness at the start of their studies, which increased as years moved on, but their readiness declined dramatically during their final year of study. This observation concurs with studies by Coster et al. (2008) and Maharajan et al. (2017). However, the findings of a study by Williams et al. (2013), who reported students' readiness progress as their study years progressed, were not supported by this study. The students stated that the reality of healthcare and collaboration work had made them less ready for interprofessional education. There was also a lot of interference, particularly from attending medical officers, which influenced their decision. Research findings by Manilall & Rowe (2016) also supported this claim. This was supported by another study by Dehat (2012) who added that student learning was linked to non-classroom interactions with teachers, the type of peer group relationships, and extracurricular activities. The advantages of social activities and outside-of-classroom engagement are a gateway to interprofessional success that should not be overlooked (Delnat 2012).

CONCLUSION

The study's goal of investigating physiotherapists' perspectives of interprofessional education was met. It also reveals a huge disparity in interprofessional readiness among the faculty members and students. The findings of the study reported that the Malaysian students showed higher interest on interprofessional education as compared to their faculty members. The findings of this study have offered a focal point for developing interprofessional learning practices between the physiotherapy department and the university's other health departments. The findings, however, are merely a gauge of preparation prior to the start of a formal interprofessional academic session. To promote interprofessional activities, more research on physiotherapy personnel is urged. With the acknowledgement of interprofessional education, it is vital to increase faculty commitment and awareness of interprofessional preparation.

ACKNOWLEDGEMENTS

The author wishes to thank the healthcare students namely the physiotherapy students and the faculty members for participating in this study.

CONFLICT OF INTEREST

The author declares no conflict of interest.

FUNDING

This research receives no funding.

REFERENCES

1. Ahmad, M. I., Chan, S. W. C., Wong, L. L., Tan, M. L., & Liaw, S. Y. (2013). Are first-year healthcare undergraduates at an Asian university ready for interprofessional education? *Journal of Interprofessional Care*, *27*(4), 341-343.
2. Al-Qahtani, M. F. (2016). Measuring healthcare students' attitudes toward interprofessional education. *Journal of Taibah University Medical Sciences*, *11*(6), 579-585.
3. Aziz, A., Teck, L.C., & Yen, P.Y. (2011). The attitudes of medical nursing and pharmacy students to inter-professional learning. *Procedia-Social and Behavioral Sciences, 29,* 639-0645.
4. Barr, H. (2015). Interprofessional education: The genesis of a global movement. *London: Centre for Advancement of Interprofessional Education*, 1511-23.
5. Boland, D. H., Scott, M. A., Kim, H., White, T., & Adams, E. (2016). Interprofessional immersion: Use of interprofessional education collaborative competencies in side-by-side training of family medicine, pharmacy, nursing, and counselling psychology trainees. *Journal of Interprofessional Care*, *30*(6), 739-746.
6. Buring, S. M., Bhushan, A., Broeseker, A., Conway, S., Duncan-Hewitt, W., Hansen, L., & Westberg, S. (2009). Interprofessional education: Definitions, student competencies, and guidelines for implementation. *American Journal of Pharmaceutical Education*, *73*(4).
7. Chelliah, K. K., Efendie, B., & Mohamad, N. (2015). Readiness of health care lecturers on interprofessional education (IPE). *Advanced Science Letters*, *21*(7), 2501-2503.
8. Chua, A. Z., Lo, D. Y., Ho, W. H., Koh, Y. Q., Lim, D. S., Tam, J. K., & Koh, G. C. (2015). The effectiveness of a shared conference experience in improving undergraduate medical and nursing students' attitudes towards inter-professional education in an Asian country: A before and after study. *BMC Medical Education*, *15*(1), 233.
9. Coster, S., Norman, I., Murrells, T., Kitchen, S., Meerabeau, E., Sooboodoo, E., & d'Avray, L. (2008). Interprofessional attitudes amongst undergraduate students in the health professions: a longitudinal questionnaire survey. *International Journal of Nursing Studies*, *45*(11), 1667-1681.
10. Curran, V. R., Sharpe, D., Forristall, J., & Flynn, K. (2008). Attitudes of health sciences students towards interprofessional teamwork and education. *Learning in Health and and Social Care, 7*(3).
11. Delnat, C. C. (2012). *A study of attitudes of faculty and administrators towards interprofessional education* [Doctoral dissertation]. Indiana State University.
12. De Vries, D. R., Woods, S., Fulton, L., & Jewell, G. (2016). The validity and reliability of the interprofessional socialization and valuing scale for therapy professionals. *Work*, *53*(3), 621-630.
13. Ernawati, D. K. & Utami, D. K. I. (2020). The impact of inteprofessional education to health students' collaborative competencies. *International Journal of Evaluation and Research in Education*, *9*(3), 660-664.
14. Higgs, K. R., Elizabeth Ellis, J. (2001). Portrait of the physiotherapy profession. *Journal of Interprofessional Care*, *15*(1), 79-89.
15. Hind, M., Norman, I., Cooper, S., Gill, E., Hilton, R., Judd, P., & Jones, C. (2003). Interprofessional perceptions of health care students. *Journal of Interprofessional Care, 17*, 21-34.
16. Horsburgh, M., Lamdin, R., & Williamson, E. (2001). Multiprofessional learning: The attitudes of medical, nursing and pharmacy students to shared learning. *Medical Education*, *35*(9), 876-883.
17. Htay, M. N. N., Pal, S., Soe, H. H. K., Moe, S., Lwin, H., & Abas, A. L. (2019). Preference and readiness of health care students towards interprofessional education. *Manipal Journal of Medical Sciences, 4*(1), 5-11.
18. Ismail, S., Chelliah, K. K., Mohamad, N., & Efendie, B. (2013). Perception regarding interprofessional learning among health sciences undergraduates in Universiti Kebangsaan Malaysia. [Persepsi terhadap pembelajaran interprofesion di kalangan pelajar prasiswazah sains kesihatan Universiti Kebangsaan Malaysia]. *Jurnal Sains Kesihatan Malaysia*, *11*(2).
19. Jones, K. M., Blumenthal, D. K., Burke, J. M., Condren, M., Hansen, R., Holiday-Goodman, M., & Peterson, C. D. (2012). Interprofessional education in introductory pharmacy practice experiences at US colleges and schools of pharmacy. *American Journal of Pharmaceutical Education*, *76*(5).
20. Keshtkaran, Z., Sharif, F., & Rambod, M. (2014). Students' readiness for and perception of inter-professional learning: a cross-sectional study. *Nurse Education Today*, *34*(6), 991-998.
21. Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, *30*(3), 607-610.
22. Maharajan, M. K., Rajiah, K., Khoo, S. P., Chellappan, D. K., De Alwis, R., Chui, H. C., ... & Lau, S. Y. (2017). Attitudes and readiness of students of healthcare professions towards interprofessional learning. *PloS One*, *12*(1), e0168863.
23. Manilall, J. & Rowe, M. (2016). Collaborative competency in physiotherapy students: Implications for interprofessional education. *African Journal of Health Professions Education*, *8*(2), 217-221.
24. Marshall, C., & Rossman, G. (2006). *Designing qualitative research* (4th ed.). Sage Publications.
25. Meche P, Meyenberg CL, Douchamps L, Wyndham-White C, Ibrahimovic A and Jeannot E. (2017). Evolution of students' readiness for interprofessional learning amongst undergraduate students in the health profession. *Journal of Medical Education and Training*, 1, 024.
26. Newman, I., & Benz, C. R. (1998). *Qualitative-quantitative research methodology: Exploring the interactive continuum.* Southern Illinois University Press.
27. Newman, I., Newman, C., Brown, R., & McNeely, S. (2006). *Conceptual statistics for beginners.* (3rd ed.). University Press of America.
28. Olenick, M., Allen, L. R., & Smego Jr, R. A. (2010). Interprofessional education: A concept analysis. *Advances in Medical Education and Practice*, *1*, 75.
29. Interprofessional Education Collaborative Expert Panel. (2011). *Core competencies for interprofessional collaborative practice: Report of an expert panel*. Interprofessional Education Collaborative Expert Panel.
30. Parsell, G., & Bligh, J. (1999). The development of a questionnaire to assess the readiness of health care students for interprofessional learning (RIPLS). *Medical Education*, *33*(2), 95-100.

31. Rose, M. A., Smith, K., Veloski, J. J., Lyons, K. J., Umland, E., & Arenson, C. A. (2009). Attitudes of students in medicine, nursing, occupational therapy, and physical therapy toward interprofessional education. *Journal of Allied Health*, *38*(4), 196-200.
32. Sedgley, C. (2013). The responsibilities of being a physiotherapist. *Tidy's Physiotherapy*, 1.
33. Shoesmith, W., Sawatan, W., Abdullah, A. F. B., & Fyfe, S. (2016). Leadership and evaluation issues in interprofessional education in Sabah, Malaysia. In *Leading research and evaluation in interprofessional education and collaborative practice* (pp. 193-212). Palgrave MacMillan.
34. Smith, M., Ajjawi, R., & Jones, M. (2009). Clinical reasoning in physiotherapy. *Contexts in Physiotherapy Practice*, 102-114.
35. Tahir, M. K. (2020) *Pharmacy Students' interprofessional perceptions towards the pharmacy profession in Malaysia* [Power-Point slides]. Malaysian Physiotherapy Society. www.mps.org.my.
36. Talwalkar, J. S., Fahs, D. B., Kayingo, G., Wong, R., Jeon, S., & Honan, L. (2016). Readiness for interprofessional learning among healthcare professional students. *International Journal of Medical Education*, *7*, 144.
37. Thanikasalam, U. (1st August 2017). *Faculty members and administrators readiness on interprofessional education.* [Paper presentation]. International Conference on Asia Pacific Conference on Educational Management and Leadership.
38. The Allied Health Act 2016.
39. Tong, S. F., Mohamad, N., Tan, C. E., Efendie, B., Chelliah, K. K., & Gilbert, J. H. (2016). Transition from Uniprofessional towards interprofessional education: The Malaysian Experience of a Pragmatic Model. In *Leading Research and Evaluation in Interprofessional Education and Collaborative Practice* (169-192). Palgrave MacMillan.
40. Williams, B., Boyle, M., Brightwell, R., McCall, M., McMullen, P., Munro, G., ... & Webb, V. (2013). A cross-sectional study of paramedics' readiness for interprofessional learning and cooperation: results from five universities. *Nurse Education Today*, *33*(11), 1369-1375.
41. World Health Organization. (2010). *Framework for action on Interprofessional education and collaborative practice.* World Health Organization.
42. World Health Organization. (2013). *Transforming and scaling up health professionals' education and training: World Health Organization guidelines 2013*. World Health Organization.