Trust in physician among patients with type 2 diabetes mellitus in Luyang Health Clinic, Sabah and its association with treatment adherence and glycaemic control

Flecia Kundayis, MMed (Fam Med)[1], Mohd Fairuz Ali, MMed (Fam Med)[2]

[1]Klinik Kesihatan Lohan, Ranau, Sabah, Malaysia, [2]Department of Family Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Yaacob Latif, Kuala Lumpur, Malaysia

ABSTRACT

Introduction: A patient's trust in their physician is associated with their self-reported health outcome. However, the relationship between trust in physician with therapeutic and health outcome has not been adequately explored. Therefore, this study aims to assess the level of trust in physician among type 2 diabetes mellitus patients and its association with treatment adherence and glycaemic control.

Materials and Methods: A cross-sectional study was conducted in Luyang Health Clinic from 1st June 2020 to 3rd September 2020. A self-interviewed questionnaire comprises of three sections; sociodemographic, Wake Forest Physician Trust Scale (WFS) and Adherence to Refills and Medications Scale (ARMS) was completed by 281 respondents. Glycaemic control is based on the latest Hba1c profile of the respondents. Descriptive and non-parametric bivariate analysis were performed using IBM SPSS version 26.

Results: The median (IQR) level of trust in physician was 43(8) out of a possible score range of 10 to 50. Trust in physician was correlated with treatment adherence (r=−0.12, *p*=0.048). There was no significant association between trust in physician with sociodemographic factors, which include age (*p*=0.33), gender (*p*=0.46), ethnicity (*p*=0.70), education level (*p*=0.50), and household income (*p*=0.37). Similarly, there was no significant association between the level of trust in physician with glycaemic control (*p*=0.709).

Conclusion: In conclusion, trust in physician was associated with treatment adherence but not with glycaemic control. In our local context, the glycaemic control could be due to other factors. Further studies should include a multicentre population to assess other potential factors that could contribute to glycaemic control.

KEYWORDS:
Trust in physician, treatment adherence, glycaemic control

INTRODUCTION

Trust in a physician has been defined as "a reassuring feeling of confidence or reliance in the physician and the physician's intent"[1] or "a patient's optimistic acceptance of a vulnerable situation and the belief that the physician will care for the patient's interests".[2] Patients who trust their physicians are willing to be vulnerable and believe that the physician puts their best interests in managing their patients' health issues. It is, thus, an important component of the doctor-patient relationship. Trust in physician can be classified into two categories; interpersonal trust and organizational trust.[3] Interpersonal trust relates to the trust that is developed over past interactions or experience with a person. On the other hand, organisational trust or social trust is a trust held by the general society towards an organisation, such as a hospital or a clinic.

Various factors may influence trust in a physician. These include patient's characteristics or values, physician's communication skills, continuity of care and healthcare systems. Older patients and white ethnicity in western countries are associated with higher trust in the physician. Greater trust is reported in elderly patients and white ethnicity because they are involved in making decisions about their madical care and given sufficient time during their consultations.[4,5] Patients' education also may influence trust in physician. Higher education level group patients utilise more healthcare services and interact more with healthcare system.[6] Factors such as, better physician's communication skills and continuity of care also result in higher trust in physicians.[7] Good communication by providing adequate medical information, explaining diseases, listening to the patients and involving the patient in making decisions will increase physician trust.[5,8,9] Healthcare system management may also impact physician trust by restricting choices, contradicting medical decisions and controlling or restricting communication.[10]

Higher trust in physician is associated with patient's self-reported health outcomes, retention in their disease care, increase treatment adherence and patient satisfaction, thus, rendering its importance.[11,12,13] Conversely, poor trust in healthcare is associated with more medicolegal litigations due to poor communication skills and increased use of alternative treatments due to mistrust in the healthcare system.[14] This situation may adversely affect the physicians due to fear of litigation and practice of defensive medicine.[15] Furthermore, the lack of physician trust will lead to poor participation in preventive care programmes.[16]

This article was accepted: 10 May 2023
Corresponding Author: Flecia Kundayis
Email: fleciakundayis@gmail.com

In Malaysia, diabetes mellitus is a major public health concern, and the prevalence of type 2 diabetes mellitus (T2DM) has escalated to 20.8% in adults above the age of 30, affecting 2.8 million individuals.[17] Unfortunately, glycaemic control among Malaysians with T2DM is poor. The National Health and Morbidity Survey (NHMS) 2019, reported that the established diagnosis of T2DM in 2019 was 9.4%, compared to 8.3% in 2015. Furthermore, the diabetes clinical audit done among T2DM patients in 2019 reported only 32.4% of people with T2DM achieved an Hba1c target < 7%, slight improvement from 2013 which was 20.4%.[18] Poor glycaemic control results in increased microvascular and macrovascular complications, as well as premature and preventable mortality.

The study on patient's trust towards primary care provider and its association with diabetes outcome and treatment adherence are limited. Most past studies only focused on assessing the patient's trust level in the physician, while few studies assessed the relationship between trust in the physician and health outcomes.[3,19,20] Patients' trust in physician will reinforce the clinical relationship, directly increasing treatment adherence and improved health outcomes. Some studies were conducted to look at the level of trust in physician among diabetic patients and its relationship with health outcome. Studies done in Taiwan showed that trust in the physician among diabetic patient was associated with the better treatment adherence and diabetes outcomes.[12,21] Trust has contributed to improved patient's health outcomes in term of glycaemic control, quality of life and diabetes self-care.

Similarly, studies assessing the relationship between trust in the physician with therapeutic adherence and health outcome in the local setting are scarce. A local study in 2008, conducted among patients with diabetes in an urban health clinic in West Malaysia, reported that most patients had moderate trust in their physician.[22] In this previous local study, trust in physician was associated with the increase patient satisfaction but not with the glycaemic control. However, the study did not investigate the association of trust in the physician with treatment adherence. In addition, the local study was conducted in West Malaysia on the level of trust in physician was conducted over 10 years ago. The limited local studies on trust in physician are also reported in Sabah. Sabah is a state in East Malaysia with a diverse ethnic distribution of largely indigenous races. To date, no studies are available to measure the current level of trust in physician among Malaysian primary care patients in East Malaysia. This current study assesses level of trust in physician and other potential factors such as cultural difference or different patterns in their trust in the physician which may contributing to treatment adherence and glycaemic control. Therefore, the present study determines the level of trust in physician among patients with T2DM in Luyang Health Clinic, Sabah and its association with treatment adherence and glycaemic control.

MATERIALS AND METHODS

Study Design

This study is a cross-sectional study conducted among adult T2DM patients in Luyang Health Clinic, Sabah. Luyang Health Clinic is an urban primary care clinic located in the Kota Kinabalu district with about 4,896 diabetic patients under its care. Data were collected from 1st June 2020 to 3rd September 2020. The inclusion criteria were patients diagnosed with T2DM for more than a year, taking at least one antidiabetic drug, able to read or understand English or Malay language, and is 18 years of age. Those who refuse to give consent, who are critically ill or in an unstable condition, have a significant cognitive impairment such as intellectual disability and dementia, have a self-reported formal diagnosis of mental illness, and have severe hearing or visually impaired were excluded from being recruited. The sample size for this study was calculated using single mean formula based on the effects of trust in physician on adherence and diabetes outcomes by Lee et al.[12] The minimum sample size required was 281 based on the desired confidence interval of 95%, with a standard deviation of 11.48, precision (d) of 1.5 and an expected non-response rate of 20%. Using the systematic sampling approach, every sixth person who registered at the counter was approached for recruitment. The first respondent for each day was selected according to a random starting point and subsequent sampling selection according to the interval. If the patient declined to participate, the subsequent sixth patient would be approached. All the respondents were briefed about this study and had given their written consent.

Study Instrument

The questionnaire contained four sections: (1) sociodemographic questions, (2) Wake Forest Physician Trust Scale (WFS),[23] (3) Adherence to Refills and Medications Scale (ARMS),[24] and (4) latest Hba1c profile of respondents. WFS and ARMS questionnaires were both validated. WFS was a 10-item questionnaire developed to measure trust in the physician. It showed high internal consistency with a Cronbach's alpha of 0.93. The responses were based on the five-point Likert scale, where 1 reflects "strongly disagree" and 5 reflects "strongly agree". Items 2, 3, and 8 were reverse coded. The score was the total score for all questions answered in a range of 10 to 50. A higher score indicates higher trust.[23]

Meanwhile, ARMS was a 12-item questionnaire developed to measure treatment adherence and designed specifically for populations with low level of health literacy, making it suitable for the local population. ARMS had high internal consistency with Cronbach's alpha of 0.81. The responses were based on the five-point Likert scale, where 1 reflects "none" and 4 reflects "all". Item 12 is reverse coded. The score was the total score for all questions answered in a range of 12 to 48. Lower scores indicated higher adherence.[24]

The HbA1c profile of respondents was based on the latest HbA1c result. HbA1c under 7% is considered appropriate for most adult T2DM individuals based on the Malaysian Clinical Practice Guideline Management of T2DM recommendation. Both WFS and ARMS were translated into Malay using the standard forward and backward translation process. A pre-test was conducted among five patients with diabetes mellitus for face validation to check the understanding of the questionnaires and appropriateness of wording. Subsequently, a pilot testing was then performed on 30 respondents in the Luyang Health Clinic. Cronbach's

Table I: Sociodemographic profile of the respondents (n = 281)

FaVariables	N	%	Median (IQR)
Age (years)			65 (13)
≥ 60 years of age	196	69.8%	
<60 years of age	85	30.2%	
Gender			
Female	152	54.1%	
Male	129	45.9%	
Ethnicity			
Chinese	173	61.9%	
Bumiputra Sabah	82	29.2%	
India	7	2.5%	
Malay	5	1.8%	
Others	13	4.6%	
Education			
No education	57	20.3%	
Primary education	86	30.6%	
Secondary education	87	31.0%	
Pre-university	11	3.9%	
Tertiary education	40	14.2%	
Household income			
Low	263	93.6%	
Middle	12	4.3%	
High	6	2.1%	
HbA1c level			6.9 (2.1)
Good control (<7.0)	147	52.3%	
Poor control (≥7.0)	134	47.7%	

IQR = Interquartile range

Table II: Level of trust in physician among type 2 diabetes mellitus patients (n = 281)

Variable	Median (IQR)	Min, Max value
Level of physician trust in physician among T2DM patients	43 (8)	34,50

IQR = Interquartile range

Table III: Association between sociodemographic factors (age, gender, ethnicity, education level and household income) with level of trust in physician among type 2 diabetes mellitus patients (n = 281)

Variables	n	%	Trust in physician level Median (IQR)	*p* value
Age (years) [a]				
≥ 60 years of age	196	69.8%	43.0 (8)	0.33
<60 years of age	85	30.2%	43.0 (7)	
Gender[a]				
Female	152	54.1%	43.0 (8)	0.46
Male	129	45.9%	42.0 (8)	
Ethnicity[b]				
Chinese	173	61.6%	43.0 (7)	0.70
Bumiputra Sabah	82	29.2%	41.0 (5)	
India	7	2.5%	41.0 (8)	
Malay	5	1.8%	42.5 (8)	
Others	13	4.6%	41.0 (9)	
Education level[b]				
No education	57	20.3%	44.0(9)	0.50
Primary education	86	30.6%	42.0(7)	
Secondary education	87	31.0%	44.0(7)	
Pre-university				
Tertiary education				
Household income[b]				
Low	263	93.6%	43.0(7)	0.37
Middle	12	4.3%	47.0(9)	
High	6	2.1%	43.0(13)	

[a]Mann-Whitney U test
[b]Kruskal-Wallis test
*significant $p<0.05$

Table IV: Level of treatment adherence among type 2 diabetes mellitus patients (n = 281)

Variable	Median (IQR)	Min, Max value
Level of treatment adherence among T2DM	13 (2)	12,21

IQR = Interquartile range

Table V: Correlation between level of trust in physician among type 2 diabetes mellitus patients with treatment adherence (N=281)

	Treatment adherence	
Variable	r value	*p* value
Level of trust in physician among T2DM patientsa	-0.12	0.048*

[a]Spearman correlation
*significant $p < 0.05$

Table VI: Association between level of trust in physician among type 2 diabetes mellitus patients with glycaemic (n = 281)

	Glycaemic control			
Variable	Good control (HbA1c < 7.0%)	Poor control (HbA1c ≥7.0%)	U value	*p* value
Level of trust in physician among T2DM			9597	0.709
Median (IQR)	43 (7)	43 (8)		
Mean rank	142.71	139.12		

[a]Mann-Whitney U test
*significant $p < 0.05$

alpha value for 10 items of WFS was 0.78, and 12 items of ARMS was 0.73, indicating good reliability.

Data Analysis

Data were analysed using IBM SPSS Statistics version 26 and presented in frequencies, percentages and medians (IQR) where appropriate. Normality testing was done for numerical variables. Non-parametric bivariate analysis was performed in view the skewed distribution for numerical variables. The Mann-Whitney and Kruskal-Wallis tests were used to assess the association between sociodemographic factors and level of trust in physician. Spearman's correlation was used to assess the correlation between trust in physician and treatment adherence. The Mann-Whitney test was used to assess the association between trust in physician and glycaemic control.

RESULTS

A total of 330 respondents were approached for this study, and 281 agreed and completed the questionnaires, giving a response rate of 85.1%. Most of the respondents were over 60 years of age (69.8%), female (54.1%), Chinese (61.9%), had an education up to secondary level (31.0%) and mostly from the lower income group (93.6%). About half had good glycaemic control with HbA1c <7.0 (52.3%) (Table I).

Level of Trust in Physician

Out of 281 respondents, the median level of trust in physician was 43 (IQR 8). The lowest score was 34, and the highest was 50 out of a possible score range of 10 to 50 (Table II).

Association Between Sociodemographic Factors with Level of Trust in Physician

The level of trust was not significantly associated with any of the sociodemographic factors, which include age (p=0.33), gender (p=0.46), ethnicity (p=0.70), education level (p=0.50), and household income (p=0.37) (Table III).

Level of Treatment Adherence

From 281 respondents, the median level of treatment adherence was 13 (IQR 2). The lowest score was 12, and the highest was 21 out of a possible range of 12 to 48 (Table IV).

Correlation Between Level of Trust in Physician with Treatment Adherence

Spearman's correlation was used to determine the correlation between the level of trust in physician among T2DM and treatment adherence. Table V and Figure 1 showed a significantly weak negative correlation between level trust in physician with treatment adherence among the respondents (r=-0.12, p=0.048). Lower scores indicate better adherence; hence, better trust in physician was correlated with better treatment adherence.

Association Between Level of Trust in Physician and Glycaemic Control

The Mann-Whitney U test was used to determine the association between the level of trust in physician among T2DM and glycaemic control. Table VI shows no significant association between the level of trust in physician with glycaemic control among the respondents (p=0.709).

DISCUSSION

Trust in physician is scarcely studied, especially in the setting of developing countries. Several data on this aspect were confined to the western population. This study is known to be the first conducted in Sabah, aimed at assessing the level of trust in physician among T2DM in the urban population of the Luyang area, a town comprising of multiple ethnicities that also includes the local natives unique to Sabah. Overall, the respondents have relatively higher trust towards their physician, with a total median of 43 (IQR 8) out of a possible score range of 10 to 50.

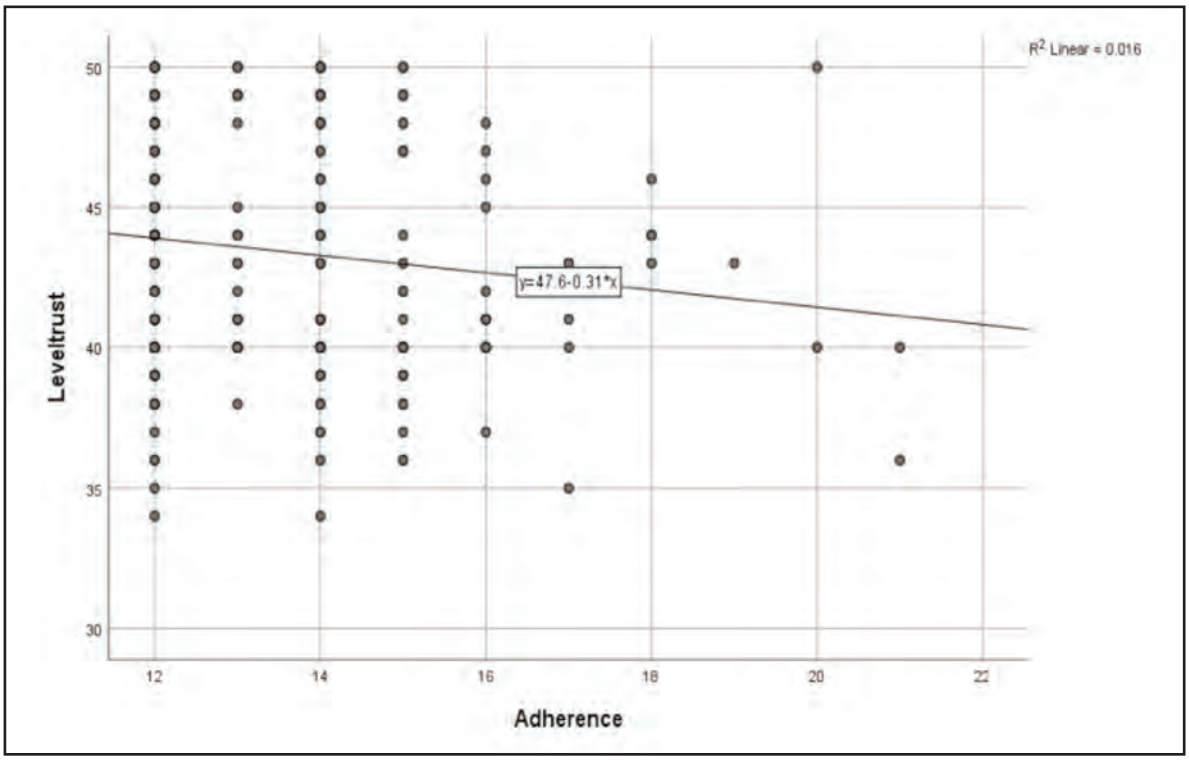

Fig. 1: Correlation between level of trust in physician among type 2 diabetes mellitus with treatment adherence

The median trust of this study is higher than the previous study.[23] A possible reason could be that most of the patients were elderly, and they have been following up in the Luyang clinic for many years. The patients had a long relationship with their regular doctors and were seen by a regular doctor each time follow up. Currently, Luyang clinic has been practising Family Doctor Concept (FDC). In this concept, each patient will be assigned to a doctor who will take care of their illness. Being seen by the same healthcare provider at every follow up will create a good doctor-patient relationship, which will enhance the continuity of care, and patient's compliance towards their treatment and management provided. The previous study has shown that the greater continuity of care between patients and healthcare providers, the higher their trust in their physician.[7]

The median (IQR) age of respondents was 65.[13] Approximately 69.8% of the respondents were ≥ 60 years of age and above. There was no significant association was noted between respondents' age and trust level in physician in this study. This finding contradicts with a study conducted in the United States of America (USA) that showed a positive association between age and physician trust, whereby elderly was associated with higher trust in physician.[5] The previous study was inconsistent with this study due to the variation of comorbidities and health status among these patients, impacting their trust in the physician.[25] Different ages have different comorbidities and health statuses, affecting their frequency of visits to the clinic. In previous study, elderly group given more time to shared care their disease. In this current study, most respondents receiving care at the clinic were mainly the elderly. The group utilises more healthcare services and interacts more with healthcare systems, resulting in the dilutional effect of age on physician trust. Similarly, the younger age group of this study also maintained a high level of trust in physician. One of the reasons could be that the patients in Luyang health clinic were given enough time for consultation to share their disease care and management plan of their disease since the implementation of the FDC at the clinic. FDC implementation had built up a good relationship and rapport between patient and physician as they were attended by the same doctor each time their follow-up. Thus, this has impacted their trust in the physician to be no difference regardless of their age.

Although the proportion of female respondents (54.1%) was higher than male respondents (45.9%) in this study, no statistically significant difference was observed in the trust in physician level among respondents according to gender. This is consistent with a previous study showing that gender was not associated with trust in physician.[26]

The majority of the respondents were Chinese (61.6%), followed by Bumiputra Sabah (29.2%), and other races, mainly Filipinos (4.6%). Despite the different races, their culture and attitude towards healthcare providers were generally similar, as no statistically significant difference was noted between trust in physician with ethnicity in the study population. These findings were consistent with other studies, showing that race was not significantly correlated with patient's trust.[2,3,27] Unlike western populations, minority groups exhibited mistrust towards healthcare providers due to certain reasons.[28] Another study in the USA showed that the white ethnicity patients were significantly associated with a higher level of trust than other ethnicities.[4] These findings were due to racial concordance between patient and physician. In Sabah, the various ethnicities have a good understanding and respect for one another. All ethnic groups

are treated equally in the clinic, hence, the absence of significant trust levels difference.

The majority of the respondents had completed their secondary education (31%). However, only (14.2%) completed their tertiary education, while the other respondents had neither education (20.3%) nor completed their primary education (30.6%). There was no significant association between the education level of the respondents with trust in physician level. This finding was not consistent with a previous study where higher education was associated with higher trust level in physician.[6] Higher education level group patients utilise more healthcare services and interact more with healthcare system. The previous finding was not similar in our society, as most patients in this population will see their doctors when needed and most patients will play assertive roles when encountering care providers regardless of their educational level background.

The majority of the respondents had a low household income (93.6%). No statistically significant difference in the level of trust in physician among respondents was observed according to their household income. This was consistent with a previous study showing that household income was not associated with trust in physician.[6]

A significant association was found between trust in physician with treatment adherence. Better trust in physician was correlated with better treatment adherence. Aspects of trust are essential to a patient's medication compliance. This finding was consistent with a previous study where higher trust in physician will increase patients' likelihood to adhere their medications.[29] In addition, higher trust in physician was also associated with reduced difficulty in adhering to their treatment.[12,30] Training interventions to improve physician competency, communication or provide the patients with more information about their treatment and give them a chance to discuss options might increase the patient's trust in the physician, and indirectly improving their adherence towards medications.[31] When trust in physician higher, patient will likely take their medication as advised by their regular doctor. Thus, it is important to educate physician to improve patient's trust by built up a good relationship and rapport with their patient.

The respondents' median HbA1c was 6.9 (IQR 2.1). Most respondents had good control of diabetes, with HbA1c < 7.0 (52.3%). No significant association was noted between the level of trust in physician with their glycaemic control. It was consistent with a local study done in West Malaysia, which showed no association between trust in physician with glycaemic control.[22] However, this finding was inconsistent with other study done in Taiwan, which showed trust in physician were significantly correlated to patient's diabetes outcome.[12,21] Trust might not be an independent factor influencing glycaemic control in our population because many other factors can influence glycaemic control other than trust in physician alone. Past studies have shown that diabetic control can be influenced by other factors such as length of doctor-patient relationship, the number of visits with the doctor, physician's character and communication.[27] Diabetes outcome were also influenced by the patients' comorbidities, adherence to the diet, and physical activity.[32-34] These factors could have a stronger influence on diabetes outcome than trust in physician, resulting in a lack of association between trust in physician and glycaemic control in this study. More studies are needed to confirm or disprove these potential factors and need to be confirmed in a larger population because the results of this study were only specific to one population.

LIMITATIONS

Although this study was the first local study that looking on trust level in physician among Malaysian primary care patients in East Malaysia and its effect towards health outcome, it had a few limitations. First, this study was a cross-sectional study; hence, the longitudinal dimension relationship between trust and health outcome could not be confirmed. Second, social desirability bias might occur due to the self-interviewed questionnaire. Third, the study population only limited to one centre. This study was conducted in an urban area, and the results might not reflect whole Sabah's population. The respondents were generally similar in terms of age, ethnicity, and socioeconomic status in this study. This similarity might result in identical cultural practise and attitude towards healthcare providers, which may affect their trust towards their physician. Lastly, this study did not collect information on other potential factors that may potentially affect diabetes control, such as doctor-patient relationship, comorbidities, diet, and physical activity. These factors may potentially effect on glycaemic control and should be explored in future studies.

CONCLUSION

This study shows that trust in physicians was relatively high in T2DM patients. In conclusion, trust in physician was significantly correlated with treatment adherence, but it is not associate with glycaemic control. Similarly, no significant association was seen between trust in physician with all the sociodemographic factors (age, ethnicity, gender, education level and household income). Future studies are recommended to explore on the gaps that found in this study, which has been mentioned earlier in the discussion. In this study, the age, ethnicity and socioeconomic status of the respondents were generally similar. This similarity might result in their cultural practise and attitudes towards healthcare providers being generally identical, resulting in similar trust towards physicians. Thus, future research that includes a multi-centre population is recommended to provide a more accurate representation of the Malaysian population. In addition, it would be better to explore other types of trust, such as trust in other medical healthcare workers or healthcare systems.

ACKNOWLEDGEMENT

The author would like to thank all the respondents who voluntarily participated in this study and the Ministry of Health for the permission to conduct this study.

FUNDING AND CONFLICT OF INTEREST

This study was self-funded and there was no conflicts of interest.

ETHICAL APPROVAL

This study was approved by the Medical Research and Ethics Committee (MREC) of the Ministry of Health Malaysia (NMRR-18-3894-45364). Permission to use both the questionnaires have been obtained from the respective authors. Permission to conduct the study at the Luyang Health Clinic, Kota Kinabalu, Sabah, was also obtained from the Sabah State Health Department, Kota Kinabalu District Health Office, and the Family Medicine Specialist (FMS) in charge of the clinic. All respondents who took part in this study had given their written consent.

REFERENCES

1. Caterinicchio RP. Testing plausible path models of interpersonal trust in patient- physician treatment relationships. Social Science & Medicine. Part A: Med Psy Med Soc 1979; 13: 81-9.
2. Hall MA, Dugan E, Zheng B, Mishra AK. Trust in physicians and medical institutions: what is it, can it be measured, and does it matter?. The Milbank Q 2001; 79(4): 613-39.
3. Pearson SD and Raeke LH. Patients' trust in physicians : many theories, few measures, and little Data [Internet]. [cited Mar 2018). Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC.
4. Tarrant C, Stokes T, and Baker R. Factors associated with patients' trust in their general practitioner: a cross-sectional survey. Br J Gen Pract 2003[cited Apl 2018]. Available from: http://bjgp.org/content/bjgp.
5. Croker JE, Swancutt DR, Roberts MJ, Abel GA, Roland M, Campbell JL. Factors affecting patients' trust and confidence in general practitioners: evidence from the English National General Practitioner Patient Survey. BMJ Open 2013; 3(5): 1-8.
6. Hall MA, Foley KL, Dugan E, Exrom P. An exploration of patients' trust in physicians in training. J. Health Care Poor Underserved 2004; 15: 294-306.
7. Mainous AG, Love M, Baker R, Gray DP. Continuity of care and trust in one's physician: evidence from primary care in the United States and the United Kingdom. Fam Med 2001; 33(1): 22-7.
8. Keating NL, Gandhi TJ, Orav EJ, Bates DW, Ayanian JZ. Patient characteristics and experiences associated with trust in specialist physicians. Arch Intern Med 2004; 164(9): 1015-20.
9. Ommen OT, Holger SP, Janssen C. The relationship between social support, shared decision-making and patient's trust in doctors: a cross-sectional survey of 2197 inpatients using the Cologne Patient Questionnaire. Int J Public Health 2011; 56(3): 319-27.
10. Mechanic D Schlesinger M. The impact of managed care on patients' trust in medical care and their physicians. J Am Med Assoc 2015; 275(21): 1693-97.
11. Birkhä UJ, Gaab J, Kossowsky J, Hasler S, Krummenacher P, Werner C, Gerger H. Trust in the health care professional and health outcome: a meta- analysis. PLOS One 2017; 12(2): e0170988.
12. Lee YY Lin JL. The effects of trust in physician on self-efficacy, adherence and diabetes outcomes. Soc Sci Med 2009; 68(6): 1060-68.
13. Graham JL, Shahani L, Grimes RM, Hartman C, Giordano TP The influence of trust in physicians and trust in the healthcare system on linkage, retention, and adherence to HIV care. AIDS Pat Care STDs, 2015; 29(12): 661-7.
14. Hew HC Aniza I. Indicators for medical mistrust in healthcare – a review and standpoint from Southeast Asia. Malays J Med Sci 2017; 24(6): 5-20.
15. Nie JB, Cheng Y, Zou X, Gong N, Tucker JD, Wong B et al. The vicious circle of patient-physician mistrust in China: health professionals' perspectives, institutional conflict of interest, and building trust through medical professionalism. Developing World Bioethics 2017[cited Mar 2018]. Available from: http://nrs.harvard.edu.
16. Musa D, Schulz R, Harris R, Silverman M, Thomas SB. Trust in the health care system and the use of preventive health services by older black and white adults. Am J Pubc Health 2009; 99(7): 1293-99.
17. Hussein Z, Taher SW, Singh HKR, Chee W. Diabetes care in Malaysia: problems, new models, and solutions. Ann Global Health 2015; 81(6): 851-62.
18. Arunah C, Abdullah MN, Abdul F. National Diabetes Registry Report 2013- 2019. Disease Control Division Ministry of Health Malaysia, pp 1–34. [cited Feb 2021). Available from: http://www.aafp.org/afp.
19. Hall MA. Researching medical trust in the United States. J Health Org Manag 2006; 20(5): 456-67.
20. Wilk AS Platt J E. Measuring physicians' trust: a scoping review with implications for public policy. Soc Sci Med 2016; 165: 75-81.
21. Lee YY Lin J L. How much does trust really matter? A study of the longitudinal effects of trust and decision-making preferences on diabetic patient outcomes. Pat Edu Couns 2011; 85(3): 406-412.
22. Muzaid A. Level of patient trust in their physician among type 2 diabetic patients and its association with metabolic control. Faculty of Medicine Universiti Kebangsaan Malaysia. 2008.
23. Hall MA, Zheng B, Dugan E, Camacho F, Kidd KE, Mishra A et al. Measuring patients' trust in their primary care providers. Med Care Res Rev 2002; 59(3): 293-318.
24. Kripalani S, Risser J, Gatti ME, Jacobson TA Development and evaluation of the adherence to refills and medications scale (ARMS) among low- literacy patients with chronic disease. Int Soc Pharmacoecon Outc Res 2009; 12(1): 118-23.
25. Freburger J K, Callahan LF, Currey SS, Anderson LA. Use of the trust in physician scale in patients with rheumatic disease: psychometric properties and correlates of trust in the rheumatologist. Arthr Rheum 2003; 15: 49(1): 51-8.
26. Fiscella K, Meldrum S, Peter F, Shields CG, Duberstein P, McDaniel SH et al. Patient trust : is it related to patient-centered behavior of primary care physicians?. Med. Care 2004; 42(11): 1049-55.
27. Egede LE Michel Y. Medical mistrust, diabetes self-management, and glycemic control in an indigent population with type 2 diabetes. Diab Care 2006; 29(1): 131-2.
28. Armstrong K, Ravenell KL, McMurphy S, Putt M. Racial or ethnic differences in physician distrust in the United States. Am J Public Health 2007; 97(7): 1283-9.
29. Piette JD., Heisler M, Krein S, Kerr EA . The role of patient-physician trust in moderating medication nonadherence due to cost pressures. Arch Intern Med 2005; 165(15): 1749-55.
30. Bonds DE, Camacho F, Bell RA, Duren VT, Winfield ART, Goff DC. The association of patient trust and self-care among patients with diabetes mellitus. BMC Fam Pract 2004; 5: 3-9.
31. Rolfe A, Gibson L, Car J, Sheikh A, McKinstry B. Interventions for improving patients' trust in doctors and groups of doctors. Cochrane Database Syst Rev 2014; (3): CD00413.
32. Piette J D Kerr EA. The Impact Of Comorbid Chronic Conditions On Diabetes Care. Diab Care 2006; 29(3): 725-31.
33. Sami W, Ansari T, Butt NS, Hamid M R A. Effect of diet counselling on type 2 diabetes mellitus. Int J Scient Technol Res 2015; 4(8): 112-8.
34. Colberg SR, Sigal RJ, Yardley JE, Riddell MC, Dunstan DW, Dempsey PC et al. Physical activity or exercise and diabetes: a position statement of the American Diabetes Association. Diab Care 2016; 39(11): 2065-79.