

2022

The impact of patient-centered care on health outcomes in adolescents living with diabetes

Rashida Farhad Vasanwala Dr
KK Women's and Children's Hospital

Amos Lim
KK Women's and Children's Hospital

Lim Soo Ting
KK Women's and Children's Hospital

Lim Pei Kwee
KK Women's and Children's Hospital

Hui Yuen Ching
KK Women's and Children's Hospital

See next page for additional authors

Follow this and additional works at: <https://pxjournal.org/journal>



Part of the [Pediatric Nursing Commons](#), and the [Quality Improvement Commons](#)

Recommended Citation

Vasanwala R, Lim A, Soo Ting L, Pei Kwee L, Yuen Ching H, Xiang Feng T. The impact of patient-centered care on health outcomes in adolescents living with diabetes. *Patient Experience Journal*. 2022; 9(1):46-53. doi: 10.35680/2372-0247.1619.

This Research is brought to you for free and open access by Patient Experience Journal. It has been accepted for inclusion in Patient Experience Journal by an authorized editor of Patient Experience Journal.

The impact of patient-centered care on health outcomes in adolescents living with diabetes

Cover Page Footnote

We would like to thank Prof Fabian Yap, Dr Lois Teo, Ms Irene Chan and the team at KKH Clinic T for their support in this study. This article is associated with the Quality & Clinical Excellence lens of The Beryl Institute Experience Framework (<https://www.theberylinstitute.org/ExperienceFramework>). You can access other resources related to this lens including additional PXJ articles here: http://bit.ly/PX_QualityClinExc

Authors

Rashida Farhad Vasanwala Dr, Amos Lim, Lim Soo Ting, Lim Pei Kwee, Hui Yuen Ching, and Tan Xiang Feng

The impact of patient-centered care on health outcomes in adolescents living with diabetes

Rashida Farhad Vasanwala, *KK Women's and Children's Hospital, rashida.farhad@singhealth.com.sg*

Amos Lim, *KK Women's and Children's Hospital, amos.lim.ka@kkh.com.sg*

Lim Soo Ting, *KK Women's and Children's Hospital, lim.soo.ting@kkh.com.sg*

Lim Pei Kwee, *KK Women's and Children's Hospital, lim.pei.kwee@kkh.com.sg*

Hui Yuen Ching, *KK Women's and Children's Hospital, hui.yuen.ching@kkh.com.sg*

Tan Xiang Feng, *KK Women's and Children's Hospital, tan.xiang.feng@kkh.com.sg*

Abstract

There is increasing evidence from research studies that suggest patient-centered care has a relationship with good clinical outcomes. In Singapore, there are no studies done to assess and address the issue of patient-centered care and its association with the adolescent's ability to manage their chronic medical condition, such as Type 1 Diabetes Mellitus. The relationship between the patient and clinicians has changed from a paternalistic form to a position which aims to foster patient-centered care. More importantly, this study aims to show the adolescent's readiness and ability to assume a more mature role in management of their own medical condition. Data collection involved 85 adolescents with diabetes who were surveyed during their follow-up outpatient clinic visit at KK Women's and Children's Hospital (KKH) Diabetes Transition Clinic. The study offers important clinical and nursing implications as well as policy contributions. Improved patient-provider communication as well as high quality discharge, care transition and emotional support from providers fostered by patient-centered care are likely to contribute to better patient reported psychosocial health outcomes. These findings imply that public healthcare leaders have to place emphasis in the patient and their families' experience equivalent to those in patient safety, clinical quality, and hospital finance.

Keywords

Patient experience, quality of life, patient-centered care

Introduction

Over the last fifty years, there has been substantial progress in healthcare innovation and standard of care for pediatric patients in Singapore. But the bridging area of adolescence healthcare has only recently been identified as a vital specialty that needs attention and emphasis. This realization was due to factors such as youths leading a lifestyle with higher risk-taking behaviors, as well as enhanced medical standards of care resulting in extended survival of pediatric patients with chronic conditions into adult life. Singapore is a small young city-state with a multi-ethnic and multi-cultural population, which is now complicated with increased mental disorder reported among the youths. Hence, it is increasingly clear that the healthcare needs of the adolescents with chronic conditions are as unique as the care of pediatric or geriatric patients, requiring a patient-centered approach care. As clinical professionals, there is a need to understand and have an appreciation of the tumultuous times in neuropsychological and physical development of the adolescents. Here, we can create rapport and bond to foster perilous health behavior disclosure, gain the skills to

advice and counsel appropriately, and encourage a healthy lifestyle, which will continue throughout adult life.¹

Patient-centered care is an important aspect of management for both acute and chronic diseases,² involving a recognition of their needs and respecting their right to make health decisions. During mid-adolescence period (15 to 17 years old), many present with higher sensitive aptitude to any strict and authoritative behavior. This is a good time for a patient-centered care approach, as they look up to assume a more independent role in managing their own health condition.³ Alike to grownups, the adolescents should be inclined to act on their own free will (for example taking medicine as they believe in its usefulness to cure them) rather than feel external pressures by someone who plays a significant role in their lives (for example, taking medicine as their parents or physicians tell them to do so). Getting adolescents to be engaged in patient-centered care will support their increasing need for autonomy as well as independence.⁴ This will also grow their perspective of being empowered as a patient,⁵ including competence, feelings of having control of their illness and their belief in their own ability to succeed in a

task. This sense of patient empowerment may in turn have an effect on treatment outcomes, such as metabolic control and adhering to treatment regime.⁶ Taken together, it can be reasonably argued that it's vital to better understand how patient-centered care is associated with patients' clinical outcomes because their perceptions (beliefs) likely affect the patients' behaviors in managing diabetes.

This study evaluates how patient-centered care delivered in the outpatient clinic for adolescent patients with diabetes can influence their quality of life.⁷ It seeks to better understand this relationship and determine the legitimacy of patient-centered care as an evidence-based concept for improving care for patients with chronic conditions in the public healthcare institutions and meaningfully contribute to the fight against diabetes in Singapore.⁸

Data Collection and Method

The research data collection was completed in KKH Diabetes Transition Clinic that sees adolescents aged between 13 years to 20 years. These are critical transition years for adolescent in Singapore, as they transit from primary to secondary school level at 13 years old and transit into the legal adulthood at 21 years. The participant's in this study consisted of patients who have a diagnosis of diabetes (Type 1 or Type 2) in their medical record for at least 1 year, with 3 or more follow-up visits at the clinic. Participants must be managing their condition independently and able to communicate in English. Patients were excluded if they have multiple medical comorbidities documented in medical records.

Recruitment in the study took place between November 2018 and February 2019. Patients were approached at their appointment at diabetes follow-up in the outpatient clinic. Diabetes Advanced Practice Nurses and Specialty Nurses introduced the research intent and workflow in the privacy of the consultation room and took verbal consent from patients interested in participating in the study. No patient identifier information was obtained in this study. Patients completed validated questionnaires with information on demographics, patient-centered care and quality of life. The research was approved by SingHealth Centralized Institutional Review Board (CIRB) approval no. 2018/2869 and Nanyang Technological University (NTU) Institutional Review Board approval no. IRB-2018-12-006.

Patient-centered care measurements

Patient-centered care was measured using 23 questions from the KKH Outpatient Experience Survey, which was adapted from both the HCAHPS® Hospital Survey^{9,10} and the Picker Commonwealth Survey of Hospital.^{11,12} Both surveys are valid and reliable measurement and has been modified and used in many hospitals internationally. Beattie et al (2015)¹⁰ have identified strong psychometric

characteristics of HCAHPS in a systemic review to assess instruments that measure patient experience. They reported content validity, structural validity, and internal consistency reliability of the HCAPHS. The patient experience questions were commonly measured on a 4-point Likert scale, the answer options were 1) "always," 2) "usually," 3) "sometimes," and 4) "never." This method is referred as patients "reporting" of events that did or did not occur during an inpatient or outpatient experience with the clinical care team.

Patients would report on few aspects surrounding the exhibit behaviors of healthcare providers showing courtesy and respect, listened carefully to them, explained things in a way that was easy to understand, were fully aware of their health conditions and provided emotional support. Patient-related experience was assessed on whether the needs, values as well as stated preferences of the patient were respected, whether the care received across multiple providers and varying departments flowed smoothly and whether there was continuity and seamless transition to home.

In addition, the global evaluation of care was asked in the survey to obtain patients' perception of their overall experience at the hospital. This item is similar to those that many service providers use in surveys and held accountable by heads of departments. It is illustrated by the item: "Would you recommend KKH services?" This component was evaluated on the 4-point Likert scale that ranged from (1) "definitely yes" to (4) "definitely no."

Quality of life

Quality of life was assessed using the 23-point questionnaire for the Pediatric Quality of Life Inventory providing a summary of impact on physical health and activities (8 items), impact on emotional functioning (five items), social functioning (five items) and school functioning (five items). It is a valid assessment that aids identification of problems that negatively impact QOL.¹³ The instructions ask how much of a problem each item has been during the past one month. Every item has five probable scores with a range from 0 to 4, "0" represents "never" and "4" "all the time." Items are reversed scored and linearly transformed to a 0-100 scale as follows: 0=100, 1=75, 2=50, 3=25, 4=0. Higher scores indicate better health-related quality of life.

The Psychosocial Health Summary score is a computed mean of the Emotional, Social, and School functioning subscales. The physical functioning scale is the same as the Physical Summary score. In addition, the computed mean of the Emotional, Social, School functioning, and Physical scales are used to generate a Total Summary score. Questions used in the "Impact on physical health and activities" score ask how often diabetes affects their daily lives, such as preventing respondent from doing sports

activities or exercise. Questions used in the “Impact on School functioning” score ask how often symptoms related to diabetes affects them such as missing school because of diabetes. Questions used in the “Impact on Social functioning” score ask how often diabetes affects their social relationships and whether their friendships are limited. Questions used in the “Impact on Emotional functioning” score ask how often diabetes causes worries and fears in them. Table 1 lists the questions and the breakdown of the quality-of-life scores.

Statistical analyses

After testing for normal distribution, means and percentages for all variables were calculated, Spearman correlations were run to examine adjusting for relevant covariates, including age and comorbidity burden. An analysis of correlation was used to determine the direction and the degree of association between patient-centered care and QOL. Spearman’s non-parametric rank correlation coefficient was utilized as both variables are measured on an ordinal scale. The magnitude of the correlation coefficient determines the strength of the

consistent rules for assigning strength of association to values; however some guidelines are provided by Jacob Cohen.¹⁴ He suggested that a relationship of 0.5 is large, 0.3 will be moderate, and 0.1, small.

The test probability (p) was used for the evaluation of whether the results of the study allowed us to generalize conclusions regarding the existence of a correlation beyond the research sample where the correlations detected in the sample were a consequence of a general rule for the entire population, or simply an unintended result. Values lower than or equal to 0.05 ($p \leq 0.05$) confirmed that the correlation discussed is statistically significant. All analysis was performed using Microsoft Excel.

Results

We have standardized the variables for the measuring unit that differed between the two tools; KKH Outpatient Experience Survey and Pediatric Quality of Life Inventory questionnaire (i.e. 0–3 and 0–100, respectively). The scores

Table 1. Breakdown of Quality-of-Life Scores

	Mean	Std. Deviation
Quality-of-Life Score		
1. It is hard for me to walk more than a couple of streets (about 100 metres)	95.00	12.08
2. It is hard for me to run	83.93	21.13
3. It is hard for me to do sports activities or exercise	83.53	20.97
4. It is hard for me to lift heavy things	85.59	17.41
5. It is hard for me to have a bath or shower by myself	99.71	2.71
6. It is hard for me to do chores around the house	94.71	11.63
7. I have aches and pains	73.82	22.79
8. I feel tired	63.25	26.00
Physical Health Summary Score	85.01	21.34
1. I feel afraid or scared	79.71	22.66
2. I feel sad	76.18	23.43
3. I feel angry	74.12	27.40
4. I have trouble sleeping	75.88	26.29
5. I worry about what will happen to me	68.53	26.77
Emotional Functioning Score	74.88	25.52
1. I have trouble getting on with other teenagers	84.12	20.72
2. Other teenagers do not want to be my friend	85.59	18.65
3. Other teenagers tease me	84.71	21.85
4. I cannot do things that other teenagers my age can do	83.93	21.83
5. It is hard to keep up with other teenagers my age	85.84	19.98
Social Functioning Score	84.83	20.56
1. It is hard to pay attention in class	76.47	25.10
2. I forget things	62.94	25.18
3. I have trouble keeping up with my school / college work	74.41	25.87
4. I miss school / college because of not feeling well	83.82	21.72
5. I miss school / college to go to the doctor or hospital	71.18	23.31
School Functioning Score	73.76	25.12
Psychosocial Health Summary Score	77.81	24.34
Total Score	80.31	23.59

correlation. Based on literature review, there are no

of the patient-centered care variables were converted to

the same unit of measurement as the Pediatric Quality of Life scores (0–100) by multiplying these by 33.33. By adding the responses to the individual items and dividing them by the number of items completed, an average total QOL score per patient was calculated (Scoring PedsQL). The mean was calculated as the sum total of the items in the Emotional, Social and School-functioning scales in order to produce the Psychosocial Health summary result. The Physical Health Summary Score was taken directly from the Physical Functioning Scale Score. Analysis should exclude respondents who completed half or less of the items in the subscale. This never happened in this study, however. We used the QOL of the patient as possible correlations for patient-centeredness level.

A total of 95 questionnaires were distributed among adolescents (age range 13 – 20 years old) on follow-up in the diabetic clinics from 21 November 2018 to 28 February 2019. Only 85 questionnaires were completed, giving a response rate of ~90%. Out of the 57 respondents who indicated their age, 48 (84%) of the participants were between the ages of 13 to 17 years old, while the remaining 9 (16%) were 18 to 20 years of age. Out of the 58 respondents who indicated their gender, 38 (65%) were Female. For those who indicated their education level, 45 (88%) of them were attending Secondary School.

Pediatric Quality of Life Inventory

The Pediatric Quality of Life Inventory questionnaire was broken down to Psychosocial Health Summary Score and Physical Health Summary Score (Table 1). Of the Quality-of-Life score, the mean Physical Health Summary Score was 85.01, $\sigma=21$. The mean Psychosocial Health Summary Score was 77.81, $\sigma=23.34$

Correlation study of selected scales

The values of the coefficients of the Spearman ranking, together with the statistical significance assessment of tested correlations between the adolescent's assessment of patient-centered care with their healthcare provider and their reported quality of life can be obtained in Table 2. Out of the 23 KKH Outpatient Experience Survey measurements, 19 of them had positive correlation to physical health outcome, of which 2 were significantly correlated with physical health outcome: "Confidence and trust in the doctors treating the patient" ($r = 0.23$; $p < 0.05$), "Getting information about what symptoms or health problems to look out for after patient left the hospital" ($r = 0.216$; $p < 0.05$). Items pertaining to courtesy and respect displayed by staff were inversely correlated to physical health outcomes. These included "How often did doctor's assistant treat you with courtesy and respect ($r = -0.015$, $p = 0.894$), and "How often did nurses treat you with courtesy and respect" ($r = -0.036$; $p = 0.7458$). The two questions most negatively related to physical health outcomes were whether doctors' assistant listened

($r = -0.078$; $p = 0.487$) and whether staff worked well and, in an age-appropriate manner with you ($r = -0.091$; $p = 0.413$).

All 23 KKH Outpatient Experience Survey measurements had positive correlation to psychosocial health outcome, of which 7 were significantly correlated with psychosocial health outcome: 4 of these measurements had high statistically significant correlation coefficients of more than 0.3, suggesting a moderate positive relationship to psychosocial health outcome (Cohen, 1998) (34). as follows: (1) "How often did the doctor's assistant explain things in a way you could understand" ($r = 0.348$, $p < 0.001$), (2) "Did you get information about what symptoms or health problems to look out for after you left the hospital" ($r = 0.347$, $p < 0.001$), (3) "How often did the nurses explain things in a way you could understand" ($r = 0.318$, $p < 0.01$) and (4) "If you had worries or concerns during your treatment, how often did doctor/nurse discuss them with you" ($r = 0.303$, $p < 0.01$). There were 3 statistically significant correlated measures with a small correlation to psychosocial health outcome (r value between 0.1 and 0.29). They were the following, "How often did you have confidence and trust in the doctors treating you" ($r=0.239$, $p < 0.05$). How often did the doctor's assistant treat you with courtesy and respect" ($r=0.224$, $p < 0.05$) and "How often did the counter staff explain things in a way you could understand" ($r=0.291$, $p < 0.01$

There is a statistical significance evidenced by their correlation association strength of $r \geq 0.3$ among three domains: between (1) provision of clear explanation by providers in a way that patient could understand, (2) availability of information about what symptoms or health problems to look out for after patients left the hospital and (3) opportunities for patients to discuss their worries or concerns with a doctor or nurse had moderate relationship to patients' psychosocial health. However, 19 of the patient-centered care measures had correlation values between 0.083 to 0.291, indicating somewhat weak relationship to psychosocial health. In terms of physical health outcomes, 19 patient-centered care measures had correlation values between 0.027 and 0.23, indicating a weak relationship. In addition, contrary to our earlier expectations, measurements pertaining to courtesy and respect displayed by staff, whether doctor's assistant listened and whether staff worked well in an age-appropriate manner, were inversely correlated to physical health outcomes. This could suggest that individual physical health outcomes are linked to other factors such as individual motivation, personal lifestyle, or peer support.

Table 2. Correlation between Patient-Centered Care and Quality of Life

	Physical Health Outcome		Psychosocial Health Outcome	
	Correlation, r	p - value	Correlation, r	p - value
Patient-Centered Care Score				
1. How often did nurses treat you with courtesy and respect?	-0.036	0.746	0.185	0.092
2. How often did nurses listen carefully to you?	0.037	0.735	0.129	0.243
3. How often did nurses explain things in a way you could understand?	0.124	0.260	0.318	0.003**
4. How often did you have confidence and trust in the nurses treating you?	0.109	0.324	0.201	0.067
5. How often was the nurse fully aware of the patient's important medical information?	0.103	0.366	0.124	0.278
6. How often did doctors treat you with courtesy and respect?	0.075	0.498	0.075	0.501
7. How often did doctors listen carefully to you?	0.143	0.196	0.107	0.331
8. How often did doctors explain things in a way you could understand?	0.091	0.413	0.186	0.090
9. How often did you have confidence and trust in the doctors treating you?	0.232	0.034*	0.239	0.028
10. How often was the doctor fully aware of patient's important medical information?	0.020	0.862	0.118	0.295
11. How often did the doctor's assistant treat you with courtesy and respect?	-0.015	0.894	0.224	0.044*
12. How often did the doctor's assistant listen carefully to you?	-0.078	0.487	0.101	0.372
13. How often did the doctor's assistant explain things in a way you could understand?	0.097	0.389	0.348	0.001***
14. How often do you think that staff worked well and, in an age, -appropriate manner with you?	-0.091	0.413	0.049	0.659
15. How often were the different staff members consistent with each other in providing you information and care?	0.043	0.701	0.184	0.094
16. How often was there good communication between the different staff members treating you?	0.027	0.807	0.083	0.454
17. If you had worries or concerns during your treatment, how often did doctor/nurse discuss them with you?	0.125	0.266	0.303	0.006**
18. How often were you given enough input or say in your care?	0.079	0.474	0.208	0.058
19. How often did you have enough privacy?	0.157	0.153	0.187	0.089
20. Were you taught all you needed to know about how to care for yourself at home?	0.112	0.312	0.105	0.340
21. Did you get information about what symptoms or health problems to look out for after you left the hospital?	0.216	0.048*	0.347	0.001***
22. How often did the counter staff explain things in a way you could understand?	0.087	0.433	0.291	0.007**
23. How often did the counter staff treat you with courtesy and respect?	0.041	0.714	0.202	0.065

N:85, * denote Statistically significant at $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$

Discussion

To the best of our knowledge, this study is one of the first in Singapore to examine the extent of adolescents' perceptions towards patient-centered care with their clinical care team, in relation with characteristics of quality of life (physical health and psychosocial health). Diabetes and its treatment regimen may affect several aspects of the patient's life, including the physical, psychological, social, and school functioning aspects. They require long-term care, frequent follow-up to the hospital, and self-directed

health seeking behaviors with the diabetes care team. Effective communication between providers and patients, as well as the provision of adequate health care information with regards to symptoms or health problems to look out for and supportive care to patients, may affect patient experience and other health outcomes, including psychosocial health.¹⁵ In this sample of adolescents with diabetes, significant relations existed between patient-centered care and both the physical as well as psychosocial component of quality of life (QOL). Thus, the positive relationship between patient-centered care and patient's quality of life is promising. Improved patient-provider

communication as well as high quality discharge/care transition and emotional support from providers fostered by patient-centered care are likely to contribute to increased patient reported psychosocial health outcomes as evidenced in their correlation association strength of $r \geq 0.3$.

Patient-provider communication

It is reasonable to expect, as shown in a study of 479 cancer patients, that receiving clear communications from providers indicate better quality of life.¹⁶ From a statistical point of view, the present study results showed that a statistically significant correlation exists between good patient-provider communication and patient quality of life in the psychosocial domain. (1) “How often did the doctor’s assistant explain things in a way you could understand” ($r = 0.348, p < 0.001$), (2) “How often did the nurses explain things in a way you could understand” ($r = 0.318, p < 0.01$). It can therefore be predicted that certain correlations also exist in the target population outside of the study population. In addition, the hypothesis that was validated with a positive sign of the correlation coefficient on better communication between healthcare providers and a better quality of life. However, the strength of the correlation is moderate, which suggests that the quality of life of adolescents living with diabetes is not only determined by the communication of patient providers. In the specialized clinic in KKH, nurses and doctors’ assistants have the highest proportion of direct interaction with patients, working with adolescents on chronic disease self-care and management, along with health promotion. The nurses and doctors’ assistants are therefore in a unique position, through patient education and symptom management to improve patient experience and their quality.¹⁷

Discharge and care transition (self-management)

Regarding continuity and transition to home, about 30% of the adolescent patients surveyed reported that they did not always receive information about symptoms or health problems signals to watch out for at home. Additionally, a correlation between patient’s discharge and care transition and their quality of life (psychosocial functioning) was calculated. The values of the coefficients of the correlation between whether patients receiving information about what health problems or symptoms to look out for after they leave the hospital and quality of life in terms of psychosocial domain, turned out to be the second strongest correlation between patient-centered care and quality of life in the psychosocial domain. However, the strength of the relationship can be only defined as moderate ($r = 0.347, p < 0.001$), which suggests that there could be other various aspects (e.g., patient’s high stress level at diagnosis and the duration of diagnosis when answering this survey). Nevertheless, these findings provide an area for service improvement to strengthen the workflow of patients receiving information about what

health problems or symptoms to look out for at home. It has the potential to improve clinical outcomes (i.e., psychosocial health in adolescents) and thereby reduce the under usage and over-usage of clinical treatment in chronic disease, including diabetes complication which requires an intensive treatment plan.¹⁸

Caring for patient’s emotional needs

The results obtained in this study indicated that emotional support from providers fostered by patient-centered care were likely to contribute to an increased patient reported psychosocial health outcomes. This is shown from the question, “If you had worries or concerns during your treatment, how often did doctor/nurse discuss them with you” and quality of life in psychosocial domain ($r = 0.303, p < 0.01$). The positive correlation suggests that the higher the opportunities for patients to discuss worries or concerns, the higher the score in their psychosocial domain. It is inferred that emotional support from providers fostered by patient-centered care are likely to contribute to increased patient’s emotional functioning, ability to get along with others and ability to cope in school.

Providers can apply consistent and validated psychosocial surveillance, assessment and diagnostic in an escalation sequence with results leading to further evaluation, starting with informal inquiries followed with assessment questionnaires. The provider may ask, for example, whether mood changes have occurred in the past two weeks or after his last visit. In addition, providers could consider asking whether treatment and self-management challenges exist, such as feeling overwhelmed or worried by diabetes or other stressors. Additional questions and the use of validated measures to assess and guide the selection of suitable interventions can be examined for positive responses.

Study Limitations

The current study has a few limitations. First, the data remain correlational and, therefore, we can’t determine the causal direction or exclude effects of possible confounding factors that were not accounted. For example, patient social support and their knowledge of diabetes, duration of diagnosis, the characteristics of healthcare provider (i.e., gender, experience), characteristics of the parent (i.e., style of parenting and educational level), or other elements of the clinic visit (i.e., the child’s mood prior to the clinic visit). Secondly, the sampling group was quite homogenous, and therefore results cannot generalize to a diverse population that covers a wider age range such as young children or young adults. Thirdly, participants had long period of relationship with clinical team at KKH clinic. The outcomes could be different in hospitals where patients switch between healthcare providers. Fourth, information was not collected from study participants

concerning the prescribed medicines for diabetes treatment. Therefore, potential deviations in the link between patient-centered care and patient quality of life predicated on the intensity of medication cannot be regarded.

Future research may benefit from understanding and appreciating the interaction between individuals' unique characteristics and the distinct relationships. For example, the relationship between the parent and adolescent, the physician and parent, as well as the physician and the adolescent. For example, qualitative data can be observed and recorded through one-to-one interviews with patients, focus groups and semi-structured interviews to find out the consequence of patient's psychosocial health as a result of the different communication approach of the clinical care team. This approach allows for discovery of information that is important to patients which may not have previously been thought of as relevant.

Conclusion

In addition to the growing evidence, this study indeed suggests that improving the patient experience is related to better patient health outcomes. Using the sample of adolescents with diabetes, the result of this study shows that (1) improved patient-provider communication as well as (2) patients receiving information about their symptoms and health problems to look out for and (3) opportunities to discuss worries and concerns with care providers are likely to contribute to increased patient-reported psychosocial health outcomes, as evidenced in their correlation association strength of $r \geq 0.3$. To facilitate the detection of patients' psychological and social problems, communication skills are vital. The provision of comprehensive information to patients can help them make realistic expectations of their healthcare providers and, thus, impact their assessment of hospital care. At the diabetes clinic in KKH, nurses and doctors' assistants have the highest proportion of direct interaction with patients and play a fundamental part in every aspect of promoting health, through patient education and symptom management to improve patient experience and their quality of life.

Diabetes prevalence has increased over the years, and patients and caregivers often present with multiple psychosocial issues on living with diabetes.¹⁹ Using the sample of adolescents with diabetes, the result of this study illustrate positive use of psychosocial surveillance is likely to contribute to increased patient-reported psychosocial health outcomes. Unaddressed psychosocial needs may cause deterioration leading to mental health problems and potential physical health complications. With these presenting concerns, doctors/nurses and psychologists could include questions about well-being during routine care. Providers can apply consistent and

validated psychosocial surveillance as a basis to refer for psychological assessment and interventions.

References

1. Michaud P, Suris J, Viner R. The adolescent with a chronic condition. Part II: healthcare provision. *Arch Dis Child*. 2004;89(10):943-949. doi:10.1136/adc.2003.045377
2. Michie S, Miles J, Weinman J. Patient-centredness in chronic illness: what is it and does it matter?. *Patient Educ Couns*. 2003;51(3):197-206. doi:10.1016/s0738-3991(02)00194-5
3. Britto M, DeVellis R, Hornung R, DeFries G, Atherton H, Slap G. Health Care Preferences and Priorities of Adolescents With Chronic Illnesses. *Pediatrics*. 2004;114(5):1272-1280. doi:10.1542/peds.2003-1134-1
4. Williams G, Freedman Z, Deci E. Supporting Autonomy to Motivate Patients With Diabetes for Glucose Control. *Diabetes Care*. 1998;21(10):1644-1651. doi:10.2337/diacare.21.10.1644
5. IANNOTTI R, SCHNEIDER S, NANSEL T et al. Self-Efficacy, Outcome Expectations, and Diabetes Self-Management in Adolescents with Type 1 Diabetes. *Journal of Developmental & Behavioral Pediatrics*. 2006;27(2):98-105. doi:10.1097/00004703-200604000-00003
6. Ott J, Greening L, Palardy N, Holderby A, DeBell W. Self-Efficacy as a Mediator Variable for Adolescents' Adherence to Treatment for Insulin-Dependent Diabetes Mellitus. *Children's Health Care*. 2000;29(1):47-63. doi:10.1207/s15326888chc2901_4
7. M. Stewart, J. Brown, S. Donner, I. R. McWhinney, J. Oates, W. W. Weston, J. Jordan, "The impact of patient-centered care on outcomes", *J Fam Pract*, Vol. 49, 2000, pp. 796-804. - References - Scientific Research Publishing. Scirp.org. [https://www.scirp.org/\(S\(351jmbntvnsjt1aadkposzje\)\)/reference/ReferencesPapers.aspx?ReferenceID=555198](https://www.scirp.org/(S(351jmbntvnsjt1aadkposzje))/reference/ReferencesPapers.aspx?ReferenceID=555198). Published 2021. Accessed December 7, 2021.
8. Lai, L. (2017, August 24). National Day Rally 2017: Beating diabetes starts with small steps, says PM Lee. Retrieved from <https://www.straitstimes.com/singapore/beating-diabetes-starts-with-small-steps-pm-lee>
9. Castle N, Brown J, Hepner K, Hays R. Review of the Literature on Survey Instruments Used to Collect Data on Hospital Patients' Perceptions of Care. *Health Serv Res*. 2005;40(6p2):1996-2017. doi:10.1111/j.1475-6773.2005.00475.x
10. Beattie M, Murphy D, Atherton I, Lauder W. Instruments to measure patient experience of healthcare quality in hospitals: a systematic review. *Syst Rev*. 2015;4(1). doi:10.1186/s13643-015-0089-0

11. Gerteis M, Edgman-Levitan S, Daley J, Delbanco T. Through the Patient's Eyes: Understanding and Promoting Patient-Centered Care. *Journal For Healthcare Quality*. 1997;19(3):43. doi:10.1097/01445442-199705000-00012
12. Cleary P, Edgman-Levitan S, McMullen W, Delbanco T. The Relationship Between Reported Problems and Patient Summary Evaluations of Hospital Care. *QRB - Quality Review Bulletin*. 1992;18(2):53-59. doi:10.1016/s0097-5990(16)30507-3
13. Skinner T, Hoey H, McGee H, Skovlund S. A short form of the Diabetes Quality of Life for Youth questionnaire: exploratory and confirmatory analysis in a sample of 2,077 young people with type 1 diabetes mellitus. *Diabetologia*. 2006;49(4):621-628. doi:10.1007/s00125-005-0124-0
14. Lachenbruch, P. and Cohen, J., 1989. *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). *Journal of the American Statistical Association*, 84(408), p.1096.
15. McManus, M., McCarthy, E., Kozak, L. and Newacheck, P., 1991. Hospital use by adolescents and young adults. *Journal of Adolescent Health*, 12(2), pp.107-115.
16. Li, C., Matthews, A., Dossaji, M. and Fullam, F., 2017. The Relationship of Patient-Provider Communication on Quality of Life among African-American and White Cancer Survivors. *Journal of Health Communication*, 22(7), pp.584-592.
17. Jortberg, B., Miller, B., Gabbay, R., Sparling, K. and Dickinson, W., 2012. Patient-Centered Medical Home: How It Affects Psychosocial Outcomes for Diabetes. *Current Diabetes Reports*, 12(6), pp.721-728.
18. Fukui, S., Ogawa, K. and Yamagishi, A., 2010. Effectiveness of communication skills training of nurses on the quality of life and satisfaction with healthcare professionals among newly diagnosed cancer patients: a preliminary study. *Psycho-Oncology*, 20(12), pp.1285-1291.
19. Cheah, J., 2001. Chronic disease management: a Singapore perspective. *BMJ*, 323(7319), pp.990-993.