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RESEARCH

Self-health care behaviors and knowledge of youth living with HIV

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ABSTRACT

Background: Thailand is facing problems with the increasing number of youths living with the human immunodeficiency virus (HIV).
Objective: The objective of this research was to study the self-health care behaviors and knowledge of youths living with HIV who were receiving antiretroviral therapy (ART).
Methods: This mixed-methods study consisted of quantitative self-administered online questionnaires and qualitative telephone interviews using a topic guide. Data analysis used descriptive statistics and thematic analysis.
Results: A total of 22 youths aged between 15 and 24 years living with HIV who were receiving ART were recruited. Overall self-health care behavior mean scores (out of 4) among the participants were good (3.17 ± 0.41). The mean scores of the 6 self-health care behavior domains in descending order were as follows: spiritual growth (3.35 ± 0.21), health responsibilities (3.26 ± 0.43), stress management (3.10 ± 0.31), nutrition (3.08 ± 0.33), interpersonal relations (3.05 ± 0.36), and physical activity (2.87 ± 0.72). Most of the participants (63.64%) had a good level of knowledge about HIV/Acquired Immune Deficiency Syndrome (AIDS) with a mean score of 16.68 ± 2.21.
Conclusion: The majority of individuals maintained healthy habits. However, some domains, such as physical exercise, food, and interpersonal interactions require support. The majority of respondents had a good level of knowledge about HIV/AIDS. In addition, the participants expressed a desire for a system that would support their future career opportunities.

Background

In 2019, youth (15-24 years) accounted for 2 out of every 7 new people living with human immunodeficiency virus (HIV) worldwide.[1] HIV prevalence among youth was approximately 0.3%. In 2019, 46,000 youth died from Acquired Immune Deficiency Syndrome (AIDS)-related causes.[1] National prevention programs must meet the needs of youth, especially in high-incidence locations. To ensure the durability of responses by youth, barriers to their participation must be addressed, and support must be provided for their meaningful engagement in all HIV-related processes.[1]

As the HIV epidemic continues, there is an increased need for efficient health promotion.[2,3] Knowledge and awareness about HIV/AIDS have a major impact on risk behaviors in HIV-positive persons.[2,4] The systematic review and meta-analysis by Ssewanyana et al. showed that adolescents living with HIV engaged in high risk behavior, for example, condom nonuse and risky sexual partnerships. However, intervention planning that is appropriate for the special needs and challenges (e.g., stigma, sexual behavior, depression, or orphanhood) of the adolescent living with HIV is still limited.[5,6]

The World Health Organization (WHO) defines self-health care as individuals', families', and communities' capacity to promote health, disease prevention and control, and

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Key Points

Background:

- Worldwide, there are 3.4 million youth living with human immunodeficiency virus (HIV) between the ages of 15 and 24 years.
- Thailand has a high HIV prevalence, especially among youth. The youth population in Thailand has specific needs for the implementation of programs to increase healthier behaviors and access to HIV service.
- Pharmacists must be aware of the perceptions of youth living with HIV in terms of their behavior and knowledge and attitude toward HIV in order to comprehend what they have experienced and what they require.

Findings:

- The majority of the participants engaged in healthy habits and intended to remain healthy and to take their medicines on schedule. However, other elements, such as physical activity, diet, and interpersonal relationships, required assistance.
- The majority of respondents had a good level of HIV/Acquired Immune Deficiency Syndrome–related knowledge. The participants expressed their needs for a system that would assist them with their future career opportunities.
- The outcomes of this study will serve as a feedback loop for stakeholders interested in developing HIV care programs geared to the youth population. Youth-focused initiatives would enhance the quality of health care services available for youth in Thailand and around the world. The authorities should establish health care systems that will ensure the mental, physical, and future well-being of youth.

self-manage mild illness with or without the assistance of a health care practitioner.[7] Self-health care is very important in ensuring that sufficient attention is devoted to the body, mind, family, and environment.[7] Self-health care activities involve a range of domains, including nutrition, exercise, medicine, emotion, sleep, and medical treatment.[8] Despite this, self-health care strategies for persons living with HIV may differ on the basis of the individual's needs and context.[8-10]

Effective self-health care is critical for successfully managing the symptoms in those living with HIV/AIDS. The majority of health care for people living with HIV/AIDS is provided in outpatient and home settings. Therefore, it is vital for health professionals to understand self-health care strategies in order to support patients in implementing successful therapy and maintaining an optimal quality of life.[11]

Self-health care programs for behavioral and health outcomes have been discovered using a variety of approaches. These include, for example, health and illness management, health service use, disease awareness, self-efficacy in relation to sickness, problem-solving abilities, interpersonal support, social participation, psychosocial development, and the quality of life in terms of health.[8,12,13] A systematic review and meta-analysis by Crowley et al.[8] revealed that the effectiveness of self-health care for improving the-related health outcomes for adolescents living with HIV is still questionable. Self-care intervention, when compared with conventional care, had little to no effect on the majority of health-related outcomes. They were unable to determine which components of the interventions were more effective for improving the patients' outcomes. They also suggested that self-health care strategies should take the individual, societal, and health system factors into consideration.[8] Therefore, good health behavior and high adherence are required to reduce the risk of antiretroviral therapy (ART) resistance, which leads to clinical failure.[14]

Thailand has a high HIV prevalence, especially among youth.[1,15,16] Approximately half of the new HIV diagnoses in Thailand were among persons aged 15-24 years.[16] The report of the situational analysis of young people at high risk of HIV exposure in Thailand reported that youth populations in Thailand have specific needs and require the implementation of programs to increase healthier behaviors and access to HIV services.[17] It has been noted that health care providers, especially pharmacists, have critical roles in HIV-related behavior and medication counseling for someone living with HIV.[14,18-21] As explained in the reports, pharmacists can help improve HIV patient outcomes (e.g., improve adherence, decrease pill burden, decrease medication errors, increase CD4 cell counts, and increase viral suppression rates).[14,22-26] Pharmacists need to be aware of the perceptions of youth living with HIV in terms of their behavior and their knowledge and attitudes toward HIV in order to comprehend what they have gone through and the assistance that they require.[5,27,28]

Objective

The objective of this study was to determine the self-health care behaviors and knowledge of youth living with HIV who were receiving ART.

Methods

Study population

Youth aged between 15-24 years old who visited a hospital in Ubon Ratchathani, Thailand, were invited to participate in this study. This 200-bed general hospital, which is capable of secondary care, is under the authority of the Ministry of Public Health in Thailand. There is an ART clinic provided by 1 physician, 1 nurse, and 1 pharmacist, which supports services for 255 adults and 22 youth living with HIV.

The ART clinic provides a one-stop service for HIV testing and counseling for partners and family members, initiating ART, preventing mother-to-child transmission, monitoring medication efficacy and safety, monitoring and assisting in HIV care, access to laboratory testing for HIV diagnosis and monitoring treatment outcomes, and psychosocial support. The clinic provides sexually transmitted diseases and tuberculosis counseling and treatment for people living with HIV. In addition, the ART clinic also collaborates with private practitioners to facilitate referrals to the ART clinic.

In our study, the inclusion criteria for participating in the quantitative and qualitative study were as follows: (1) diagnosis of HIV infection and attending the ART clinic at a hospital; (2) age between 15-24 years;[1,29,30] (3) awareness of their HIV testing as a clinical record for more than 6 months; (4) receiving ART; (5) understanding written and spoken Thai; (6) having permission from their legal guardian to be interviewed;[31] and (7) ability to verbally consent/assent. If the participant had moved to another hospital for treatment, they were excluded from the research.[32,33] The invited participants were adolescent/youth patients living with HIV who received antiretroviral drugs therapy at the ART clinic. They were invited when they visited the clinic, and some were invited via telephone owing to the coronavirus disease 2019 (COVID-19) situation. The researcher received verbal consent from individuals aged 18 and above, as well as parental approval and adolescent assent from those under the age of 18.[34] Participants were made fully aware of the study's objective. All 22 youth outpatients, who had been treated in a secondary care hospital, were asked to participate in this research during the period of May 1-June 2021.

Ethical considerations

The youth volunteered to participate, and the researchers protected their privacy throughout the data gathering and analysis of the results. This research was approved by the Research Ethics Committee of Ubon Ratchathani University (No. UBU − REC − 9/2564).

Study design

This mixed-methods study was conducted initially using a quantitative method, followed by the use of a qualitative method to explore the HIV/AIDS-related self-health care behaviors and the knowledge of youth living with HIV who were receiving ART from the hospital. Mixed-methods research combines the strengths of quantitative and qualitative research to address issues that neither quantitative nor qualitative research alone can address as effectively.[35]

In the quantitative part of the study, the data collection was conducted using a self-administered online questionnaire. Telephone interviews using a topic guide were conducted in the Thai language for the qualitative research.[36-38]

Survey instrument

The questionnaire was composed of 3 sections, further described below and in Appendix 1.

Section 1 covered demographic information and the characteristics of the participants. Section 2 asked about HIV/AIDS-related self-health care behaviors, and Section 3 covered HIV/AIDS-related knowledge. After a literature search, Section 2 of the questionnaire was adapted with permission. Boonyaleepun et al.[39] used "the self-health care behaviors of working-age patients with HIV/AIDS receiving ART questionnaire." The validated original questionnaire was based on Pender's Health Promotion Model.[2,40] It was tested for reliability, and Cronbach alpha 0.90 was reported.[39] The original questionnaire had 6 domains of self-health care behaviors (55 items). These domains were (1) Health responsibilities (i.e., ART [11 items], self-protection from other infections [7 items], prevention of the transmission of HIV infection [5 items]); (2) Physical activities (4 items); (3) Nutrition (7 items); (4) Interpersonal relations (9 items); (5) Spiritual growth (7 items); and (6) Stress management (5 items; Appendix 2). On a 4-point Likert scale, the questionnaire items were graded: never (1 point), occasionally (2 points), frequently (3 points), and always (4 points).[39,41] The average score of each domain was calculated. A self-health care behavior mean score of 3.50-4.00 represented excellent; scores of 2.5-3.49 represented good; scores of 1.50-2.49 represented fair; and score of 1.00-1.49 represented poor.

Section 3 of the questionnaire, which was focused on HIV/AIDS-related knowledge, after a review of the literature, included a total of 20 items.[42-50] However, 19 of the initial 20 items were included in the final questionnaire. One item was removed from the final questionnaire because it was considered to be difficult and similar to question no. 6.[51-53] Each item was assessed on a 3-point scale ("Yes," "No," and "I do not know/I am not sure").[54] There were thus 4 domains (19 items) comprising knowledge related to HIV/AIDS (2 items), transmission (4 items), opportunistic infection (OI) (4 items), and ART (9 items). The classification for the knowledge questions was as follows: good (> 80% or 16-19 points), regular (60%-80% or 11-15 points), and insufficient (<60% or 0-10 points).[55]

To ensure content validity, Section 2 of the questionnaire was analyzed by a panel of 3 experts who had relevant experience and qualifications relating to the study.[56] The index of item-objective congruence (IOC) was calculated, and an accepted value over 0.5 was obtained.[57,58] The experts were asked to rate the clarity and relevance (1 = yes; 0 = I am not sure; -1 no;).[59]

According to the experts' opinions, 2 new items were added (question no. 20 regarding one's sex partner (prevention of the transmission of HIV infection domain) and question no. 42 regarding consultation with one's partner (interpersonal relations' domain) in the original questionnaire of 55-items. The IOC of the final version of the questionnaire used in this study scored between 0.6 and 1.0 for 57 items, and for Section 3 (HIV/AIDS-related knowledge), the IOC score was between 0.6 and 1.0 for 19 items. A Cronbach alpha coefficient > 0.70 was considered satisfactory.[42,60,61] The Cronbach alpha coefficient obtained for Section 2 (HIV/AIDS-related self-health care behaviors) was 0.879, and Section 3 (HIV/AIDS-related knowledge), it was 0.720.

Qualitative study

The purpose of this qualitative study was to ascertain the perceptions of the youth participants living with HIV/AIDS about their self-health care habits and experiences. Semistructured interviews were conducted with 10 youth aged 18-24 years from May-June 2021. The first author (K.T.) has been a pharmacist in the antiretroviral drugs clinic for 10 years. She interviewed all of the participants. The interviews lasted between 15 and 30 minutes. The interviews were conducted via telephone in the Thai language and transcribed verbatim from audio recordings, verified for correctness, and then analyzed by thematic analysis using an inductive approach.[36-38] The data gathering process was led by identifying the emergent themes and continued until data saturation occurred.[36,62,63] The following steps were taken throughout the data analysis process:

Table 1
Demographic and characteristics of the participants

Characteristics	N (%)	Characteristics	N (%)
Gender		Years taking ART therapy	
Male	21 (95.5)	< 1 y	3 (13.6)
Female	1 (4.5)	1–5 y	17 (77.3)
Age (y) (22.14 ± 1.95, range 18–24)		> 5 y	2 (9.1)
18–20	6 (27.3)	ART[a]	0 (0.0)
21–24	16 (72.7)	TDF+FTC+ EFV (TEEVIR)	14 (63.7)
Employment		GPO-vir Z 250	5 (22.7)
Government officer	2 (9.1)	AZT+3TC+EFV	1 (4.5)
Merchant/self-employed	5 (22.7)	AZT+TDF+EFV	0 (0.0)
Employee	6 (27.3)	TENO-EM + EFV	0 (0.0)
Student	3 (13.6)	TDF+3TC+ EFV	0 (0.0)
Farmer	1 (4.5)	Others	2 (9.1)
Others	5 (22.7)	CD4 cell count	
Years living with HIV		Baseline CD4 before receiving ART (cell/mm^3) (mean ± SD) (range)	298.27 ± 213.72 (9–584 cell/mm^3)
> 1 y	1 (4.5)	< 200 cell/mm^3	9 (40.9)
1–5 y	20 (91.0)	≥ 200 cell/mm^3	13 (59.1)
> 5 y	1 (4.5)	Recent CD4 (within 6–12 mo) (mean ± SD) (range)	508.50 ± 291.70 (6–1,245 cell/mm^3)
History of OI		< 200 cell/mm^3	2 (9.1)
Oral candidiasis	2 (9.1)	≥ 200 cell/mm^3	20 (90.9)
Pneumonia	0 (0.0)	Viral load	
Prolonged fever	2 (9.1)	Baseline viral load before receiving ART (copies/mL) (mean ± SD) (range)	9,597.91 ± 35,094.15 (≤40–159,089 copies/mL)
Tuberculosis	1 (4.5)	≤ 40 copies/mL	18 (81.8)
Chronic diarrhea	2 (9.1)	> 40 copies/mL	4 (18.2)
Meningitis	0 (0.0)	- Recent viral load (within 6–12 mo) (mean ± SD) (range)	7,413.55 ± 27,776.90 (≤ 40–127,219 copies/mL)
Chronic wounds	1 (4.5)	≤ 40 copies/mL	19 (86.36)
No history of OI	14 (63.7)	> 40 copies/mL	3 (13.64)

Abbreviations used: OI, opportunistic infection; HIV, human immunodeficiency virus; ART, antiretroviral therapy; CD4, cluster of differentiation four T-lymphocytes.

[a] AZT = zidovudine 300 mg, 3TC = lamivudine 300 mg, EFV = efavirenz 600 mg; TDF = tenofovir disoproxil fumarate 300 mg; FTC = emtricitabine 200 mg; TEEVIR = emtricitabine/tenofovir disoproxil fumarate/efavirenz; GPO-vir Z 250 = zidovudine 250 mg + lamivudine 150 mg + nevirapine 200 mg; TENO - EM = tenofovir disoproxil fumarate 300 mg + emtricitabine 200 mg.

(1) After data collection, 10 interviews were transcribed.
(2) Two researchers reviewed and reread the transcripts to acquire a better understanding of the participants' perceptions and experiences (K.T. and T.S.). They individually reviewed the transcripts line by line, highlighted probable codes in the hard copy of the transcript, and then began coding and creating a coding system.
(3) The code structure was revised and developed. Two authors compared and discussed the codes (K.T. and T.S.).
(4) Emerging themes were coded and were compared and contrasted regularly with the transcripts of other interviews.
(5) This study employed the intercoder agreement process to determine the reliability of responses to multiple coders of the dataset.
(6) K.T. and T.S. agreed on more than 80% of the coding for these paragraphs.
(7) K.S., T.S., C.A., and B.Y. explored the wider issues that emerged from the codes.

Results

There were 22 youth who were patients in the hospital records, and all of them participated in this study (response rate 100%). The majority of the participants were males (95.5%). The mean age was 22.14 years (SD = 1.95), with the range 18-24 years. Their education level was as follows: senior high school (8, 36.4%), bachelor's degree (7, 31.8%), junior high school (4, 18.2%), diploma (2, 9.1%), and primary school (1, 4.5%). According to their marital status, 17 (77.3%) were single, and 5 participants (22.7%) were married. The majority of the participants' family income was less than an average monthly income in the same region. The family income for 20 (90.9%) participants was approximately 20,600 THB or $615.

On the basis of sexual orientation, 18 participants (81.8%) identified as homosexual, and 4 participants (18.2%) as heterosexual. Most of the participants lived with their parents, who are also their caregivers (81.8%). About half (50.0%) of the respondents informed their family about their HIV status, of whom, 8 participants (36.4%) disclosed to a health care provider, and 3 participants (13.6%) disclosed to everyone. Most of the participants (19, 86.4%) had no underlying health conditions. According to their medication adherence in the past 6 months, the 180-day overall adherence rate was 100 %, and most of the participants (21, 95.5%) had adherence rates ≥ 95 %. Seventeen participants (77.3%) had no history of allergic reactions/adverse effects to antiretroviral medications. The demographic information and characteristics of the participants are described in Table 1.

Table 2
Mean score for each domain of self-health care behaviors in the past 6 months (6 domains, 57 items)

Domain	Mean score	SD	Level
1. Health responsibilities (24 items)	3.26	0.43	good
2. Physical activities (4 items)	2.87	0.72	good
3. Nutrition (7 items)	3.08	0.33	good
4. Interpersonal relations (10 items)	3.05	0.36	good
5. Spiritual growth (7 items)	3.35	0.21	good
6. Stress management (5 items)	3.1	0.31	good
Mean score for self-health care behaviors	3.17	0.41	good

Table 3
Mean score for each domain of HIV/AIDS-related knowledge

HIV/AIDS-related knowledge (4 domains, 19 items)	Mean	SD	Level
1. Knowledge about HIV/AIDS (2 items)	1.91	0.29	
2. Knowledge about transmission (4 items)	3.45	0.51	
3. Knowledge about OIs (4 items)	3.68	0.48	
4. Knowledge about ART (9 items)	7.64	1.62	
Overall knowledge (19 items)	**16.68**	**2.21**	**Good**

Abbreviations used: OI, opportunistic infection; HIV, human immunodeficiency virus; ART, antiretroviral therapy; AIDS, Acquired Immune Deficiency Syndrome.

Self-health care behaviors score

Overall the self-health care behaviors of youth living with HIV receiving ART was good ($\bar{x} = 3.17$, S.D. $= 0.41$) (details in Table 2). The mean scores for all the 6 domains of self-health care behaviors were at a "good" level.

HIV/AIDS related knowledge

Fourteen participants (63.64%) had a good level of knowledge, and 8 participants (36.36%) had a regular level of knowledge. The mean score for the HIV/AIDS related knowledge was 16.68 ± 2.21 (Table 3). From Table 4, most of the participants responded correctly in their knowledge about HIV/AIDS, transmission of HIV, OIs, and ART. However, participants less frequently chose the correct option on 2 questions, namely, mother-to-child transmission (50.00%) and the timing of the administration of HIV medication (63.34%).

Qualitative study

Ten of the Thai participants, 9 males and 1 female, were enrolled in this qualitative study. Details of their characteristics are shown in Table 5.

The majority of the participants were students. Most of them did not know exactly when they acquired their HIV infection. However, some participants thought that their partners were responsible for their HIV infection.

> *"I have no idea when I have been infected. I have the old lesions that never heal. Therefore, I went to the hospital. I had a girlfriend but we broke up. I don't know if she infected or not."* (Informant 2, 23-year-old male)

One participant said he acquired HIV through vertical transmission.

> *"I have it since I was born. But previously, I did not know it. I just know recently after my father died."* (Informant 6, 21-year-old male)

The thematic analysis of the information from the interview allowed the development of 6 themes, as follows.

The family has a great role in support

HIV infection is challenging for a family with a member who is living with HIV. Most of the participants disclosed their seropositive to their families and received a lot of support concerning their antiretroviral treatment and care from their family and their partners.

> *"Everyone in my family knew that I am seropositive and having antiretroviral therapy. They understand and support"* (Informant 8, 20-year-old male)

However, 3 families did not know. The participants avoided the disclosure. The reasons for not disclosing were that they are not sure whether their family would be able to accept the disease.

> *I live with my husband and my child. My husband is unaware that I am infected. I have no idea how and when I got the virus. My child was healthy because I took HIV medications while pregnant. My husband thought I was deficient in vitamins. He asked me why I needed to take medicines on a daily basis. I stated that I desire to be healthy. If I did not take them, I will become weak and may have got an infection.* (Informant 3, 19-year-old female)

Experiences of treatment

Adherence and key success factors. The majority of the participants take their medication on schedule. There is a way for reminders called "Alert on your phone." They frequently use their cell phone. When the time to take the medication comes, they will be aware and eager to take medicines.

> *"I take the medication on time, and on a regular basis until it becomes a habit and I remember. I have taken the medicine by 19:00. I always set my phone's time."* (Informant 10, 24-year-old male)

Furthermore, it was shown that encouragement from family is an important motivator for taking medications on time, for example, mothers knocking on the door when it is time to take medicine or the family call them when it is near the time to take medicines.

> *"Factors influencing success of taking medicines on time, - I believe it is the family. They will make me a call around 9:30 p.m. to remind me to take my medication."* (Informant 8, 20-year-old male)

Barriers to adherence. Some participants felt that they did not want people around them to know that they were taking antiretroviral drugs, because they think that society still does not accept living with people who live with HIV. Some people encounter problems and obstacles in taking their medication. For example, in the case of the participant who stayed with

Table 4
Frequency distribution for 19-items on HIV/AIDS-related knowledge

Knowledge (19 items)	Frequency right option	(%)
Knowledge about HIV/AIDS (2 items)		
1.All people living with HIV must be thin, have dark skin, with blisters on their skin.	20	90.91
2.Those infected, although healthy, should get their immune system (CD4) screening at least every 6 mo.	22	100
Knowledge about transmission (4 items)		
3. In the asymptomatic period, people living with HIV can transmit if they are having unprotected sex.	22	100.00
4. Having a sexually transmitted illness raises the chance of HIV transmission.	22	100.00
5. If the mother is HIV positive, then every child will be living with HIV.	11	50.00
6. Those who are living with HIV must always use condoms.	21	95.45
Knowledge about the OI (4 items)		
7. If the OI is cured, it will not be back again.	20	90.91
8. An opportunistic infectious disease occurs when the body's immune system is lowered.	21	95.45
9. Most people living with HIV die from opportunistic infections.	19	86.36
10. Person living with HIV/AIDS may contract more than 1 opportunistic infectious disease simultaneously.	21	95.45
Knowledge about ART (9 items)		
11. All people living with HIV must begin taking antiretroviral medications as soon as they are infected.	20	90.91
12. If there are adverse reactions to antiviral medication, the patient must take all of the medications and then consult their doctor.	19	86.36
13. Taking antiretroviral properly is important because noncompliance might lead to drug resistance.	20	90.91
14. The antiviral medication must be administered on a daily basis. However, you can change the eating time as needed each day.	14	63.64
15. If you believe you are in good health, you should stop taking antiviral medications right away.	19	86.36
16. Antiviral drugs are medications that prevent the HIV virus from multiplying in the bloodstream, keeping the patient healthy and free of opportunistic infection.	19	86.36
17. When people living with HIV begin taking antiretroviral medications, these must be continued.	20	90.91
18. Antiviral medications must be taken every day, on time, and on a consistent basis.	19	86.36
19. People living with HIV should avoid contracting new infections because this could lead to drug resistance.	18	81.82

Abbreviations used: HIV, human immunodeficiency virus; OI, opportunistic infection; ART, antiretroviral therapy; AIDS, Acquired Immune Deficiency Syndrome.

friends, he found that it was inconvenient to get up to take the medicine when it was time to take it.

> *I occasionally go out with friends. I had carried the medicine with me. When it was near the time to take my medications, I had to find a location, such as a petrol station to take medicine. I will take my medicine outside the car and then go back to the car to drink some water. But I was on the verge of missing the dose. As, a result, I rarely travel anyplace. I intend to take my medications on time.* (Informant 10, 24-year-old male)

> *"When I take medications, I try not to be seen by others. I always look for a place to take medicine and I always take vitamin C with it. It is like I am taking dietary supplements."* (Informant 9, 23-year-old male)

One participant stated that having many pills is an obstacle to taking medications.

> *"According to obstacles to taking my prescription, I believe it is because the number of tablets is large. There are about 4-5 pills, but I took all of them."* (Informant 2, 23-year-old male)

Another factor that may enhance cooperation in taking medications is the use of pill containers. It was one of the methods provided by the pharmacy counseling. Pharmacists advised participants to utilize a pill container with a guideline for small portions, for example, no more than 1 week, for good stability and effectiveness and portability of the medication.

Self-health care behaviors and HIV-related risk behaviors. Most of the participants recognized that self-health care behaviors such as healthy eating, exercise, and stress management can increase their well-being. Diet and stress management were helpful as well. However, some of them did not get much

Table 5
Characteristics of key informants (n = 10)

Informant	Gender	Age	Education	Occupation
1	Male	19	Diploma/High vocational certificate	Student
2	Male	23	Junior high school	Employee
3	Female	19	Junior high school	Homemaker
4	Male	24	Bachelor's degree	Merchant/self-employed
5	Male	18	Senior high school	Student
6	Male	21	Junior high school	Merchant/self-employed
7	Male	22	Senior high school	Others
8	Male	20	Bachelor's degree	Student
9	Male	23	Bachelor's degree	Student
10	Male	24	Bachelor's degree	Merchant/self-employed

exercise. The barrier to physical activity outside their house was the COVID-19 situation. They are afraid about acquiring COVID-19.

> *"I do not exercise. I usually just sleep at home. I did not go anywhere."* (Informant 2, 23-year-old male)

According to HIV-related risk behaviors, all of them are aware of how to prevent HIV transmission. They are concerned about the possibility of transferring the virus to others, especially their partners.

> *"Every sexual encounter must be safe. We must think about others."* (Informant 10, 24-year-old male)

HIV/AIDS and self-care. The majority of the participants understand what HIV/AIDS is. They were knowledgeable in preventing the virus' spread.

> *"AIDS is easily transmitted. It will not be cured, but there will be medications to prevent and restrict the spread of the AIDS virus."* (Informant 10, 24-year-old male)

Future goals. Most of the participants had goals for the future, in terms of occupation or their own business.

> *"I'd like to be a streamer. I'd like to work from home."* (Informant 5, 18-year-old male)

However, some participants were concerned about applying for a job that required a medical certificate for the application. They were reluctant to ask for a medical certificate and inform the doctor that they were taking ART.

> *"I am concerned about job applications in that for some jobs we must have a certificate as evidence of military service which shows the health record for chronic disease. That might cause a problem for me."* (Informant 10, 24-year-old male)

Messages to others. The majority of participants reported their experiences with safe sex (e.g., "always wear a condom to protect yourself from infection and as a defense against transmitting the virus from oneself to others"). They need to think about their own and others' safety.

> *"You should keep safety in mind at all times. It is a temporary pleasure. If we miss even a little, it will haunt us for the rest of our lives. I'd want to remind everyone to be concerned about their safety. If you do it without protection, be cautious and think again."* (Informant 9, 23-year-old male)

The majority of participants had a positive attitude toward themselves. They are aware of their status, accept it, and can encourage themselves that they are capable of living and working in the same way as people who are not living with HIV.

> *"People with this illness are just like everyone else. It's merely a weakened immune system. Encouragement for yourselves is very important."* (Informant 1, 19-year-old male)

> *"I want everyone to know that we are not frightening, nasty, or minority people."* (Informant 10, 24-year-old male)

The triangulation of qualitative and quantitative results revealed consistency in the participants' interpretations of self-health care behaviors in all domains except physical activity, where the quantitative part reported a high level of activity, whereas the interviews revealed that some participants did not get enough exercise.

Discussion

The majority of participants in this study (95.50%) were men, which is consistent with the Joint United Nations Programme on HIV/AIDS statistics 2020 report, which stated that men accounted for more than half of those living with HIV.[64] The HIV incidence rate, however, is highest among young women.[65] As a result, there is still a need to investigate in depth both male and female youth's self-health care behaviors and their requirements within the context of diverse countries.[5] In terms of their treatment experience as reported in this study, approximately half of the youth living with HIV told their family members about their infection. This could be related to the Thai culture, where adolescents frequently live with their families, have a parental-adolescent attachment, and have a close family relationship.[66,67] This study discovered that the family plays an important role in providing fundamental support, treating, caring for, protecting, and preventing HIV transmission. This is consistent with other studies that advocate for the implementation of family strengthening programs for children and families living with HIV/AIDS.[68-70]

Most of the participants had an undetectable viral load ($\leq$ 40 copies/mL). However, this study was not designed to collect data about sexual HIV transmission among couples, where one partner was living with HIV and the other was not. Therefore, further study is needed to study the details of HIV, which with ART is undetectable and untransmissible and which could reduce stigma and raise awareness about treatment as prevention.[71,72]

Although there have been some reports of family or caregiver capacity-building program,[73,74] parenting and family support programs for promoting healthy behavior are still needed. These should include the following services and assistance based on the needs of each family: parenting education, parent skills' development, home visits, social support, counseling, childhood and adolescent HIV education, career training, and financial aid and advocacy.[68-70] This is emphasized because youth and adolescents are at the stages of mental and physical maturation, and several studies have found and support the fact that psychosocial well-being can have a direct impact on HIV care outcomes.[75-78]

In this study, the overall score of self-health care behaviors and the self-health care scores in each domain were good. The 3 highest scores were health responsibilities, spiritual growth, and stress management. On the other hand, the lower score in 3 domains should be of concern (e.g., physical activities, nutrition, and interpersonal relations).

Despite knowing that exercise is beneficial to them, some of the participants in this study did not exercise outside their house in order to avoid contracting severe acute respiratory

syndrome coronavirus 2 infection. The WHO has stated that the COVID-19 pandemic has caused many individuals to become physically inactive. Therefore, the WHO launched a campaign to encourage individuals to engage in light-intensity physical exercise at home.[79,80] Physical activity should be emphasized for youth living with HIV. Furthermore, there have been indications that ART may be associated with muscle loss and decreased muscle strength, resulting in functional impairment, limitations of activities, a higher risk of cardiovascular disease, and a decrease in the quality of life.[81-84] Therefore, all persons living with HIV who are receiving ART should exercise in order to promote muscular growth and strength and cardiorespiratory fitness and improve their metabolic and psychological profile and overall health.[85,86]

According to the findings of this study, youth nutrition behavior is at an acceptable level. However, some of the study participants did not eat on time or eat healthy foods. Nutrition and HIV are intimately connected. Malnutrition is induced by any immune impairment caused by HIV/AIDS, and malnutrition itself induces immunologic impairment, enhances the effect of HIV, and contributes to a progression to AIDS.[87] In addition, it has been shown that youth eat more energy-dense, low-nutrient meals and less fruit and vegetables.[88,89] As a result, it is critical to improve the nutrition knowledge, promote healthy eating behavior among the youth, and improve their food environment.[90]

According to the findings of this study, there is still a need to encourage youths to engage in interpersonal relationships. When they face challenges in their lives, they consult with fewer people whom they trust. In addition, some individuals found it difficult to take their medicine in front of their peers and felt uncomfortable disclosing their illness. Adolescence and youth are the periods of mental and physical growth, and several studies have shown evidence that psychological well-being has a direct influence on HIV care results.[75-78] The WHO advised integrated mental health programs for all persons living with HIV and especially advocates for peer support strategies for youth.[78,91,92] Furthermore, not only does community support help youth who are living with HIV, but the community support needs to extend to their families as well.[69,70]

Several previous studies have shown that increasing comprehensive HIV/AIDS knowledge is a useful intervention approach in preventing HIV transmission.[93-95] The majority of the participants in this research had a good level of understanding about HIV/AIDS. However, only half of them correctly answered the question concerning mother-to-child transmission (MTCT). The majority of participants in this study classified themselves as men who have sex with men. As a result, it is possible that they were unaware of the mother-to-child HIV transmission aspect. However, Darteh et al.[96] explain that knowledge about MTCT is one of the HIV prevention techniques.[97,98] In young children, MTCT is the leading source of HIV infection. Accurate MTCT knowledge is essential because it impacts on behavior modification and supports the acceptance of self-protective behaviors such as condom usage and HIV testing.[97] The WHO also outlined an approach to the elimination of MTCT by supporting countries in strengthening the capacity of health systems (e.g., avoiding unwanted pregnancy, preventing HIV transmission from mothers to their infants, and providing appropriate medication, care, and support).[96] As a result, health care providers should provide information and counseling to youth living with HIV regarding the MTCT issue.[18,20,21,25,26]

The study's limitation is that it had a limited sample size, had only 1 female adolescent, and was done at 1 hospital, which may not reflect Thai adolescents. Future research with a multicenter design and a bigger sample size is required.[9] In addition, most of participants had an undetectable viral load ($\leq$ 40 copies/mL). However, this study did not design to collect data of sexual HIV transmission among couples, where one partner was living with HIV and the other was not. Therefore, further study is needed to study the details of the undetectable and untransmissible, which could reduce stigma and raise awareness about treatment as prevention.[71,72]

Conclusions

This study found that the majority of the participants engaged in healthy habits, intended to remain healthy, and took their medicines on schedule. However, regarding other elements, such as physical activity, diet, and interpersonal relationships, the youth require assistance. The majority of participants had adequate information about HIV/AIDS-related knowledge and were aware of HIV/AIDS. They were educated about avoiding the transmission of the virus and the need for excellent medication adherence. In addition, the participants expressed their need for a system that would assist their future career opportunities.

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Appendix 1: Survey Questionnaires and Interview Guide

Questionnaire number.....
Date.....Month.....Year.....
Self-health care behaviors and knowledge of youth living with HIV

Please read the statements below and check the boxes if you agree.

- I have read the participant information and found it to be comprehensive in answering all of my queries.
- I understand that my responses are anonymous and confidential, and that I am able to withdraw from the research at any time before submitting my responses and without giving a reason.
- I understand that my consent to participate in this study does not affect my legal rights.

The questionnaire was divided into four parts, as follows:

Part 1 Demographic questions 10 questions
Part 2 Treatment experience 9 questions
Part 3 Self-health care behaviors 57 questions
Part 4 HIV/AIDS-related knowledge 19 questions
Please allow 20-30 minutes to complete this form**.**

***Thank you very much for participating in this study.** ***

Part 1 Demographic questions
Please tick √ in the box that represent the fact

1. Gender ☐ Male ☐ Female ☐ ……..(short answer space) ☐ Prefer not to answer
2. Age ..... years old ☐ Prefer not to answer
3. Education
   ☐ None ☐ Primary School
   ☐ Junior High School ☐ Senior High School/Vocational Certificate
   ☐ Diploma /High Vocational Certificate ☐ Bachelor's Degrees
   ☐ ……..(short answer space) ☐ Prefer not to answer
4. Employment
   ☐ Government employees/State enterprise employee
   ☐ Self-employed
   ☐ Private company employee
   ☐ Student
   ☐ Farmer
   ☐ Employee
   ☐ Others (please specify) ..... ☐ Prefer not to answer
5. Household income ..... Baht/month ☐ Prefer not to answer
6. Care givers/parents
   ☐ No, I do not have ☐ Father/mother ☐ Relatives
   ☐ Others (please specify) ..... ☐ Prefer not to answer
7. Marital status
   ☐ Single ☐ Married
   ☐ Widowed/divorced/separated ☐ ……..(short answer space) ☐ Prefer not to answer
8. Sexual orientation
   ☐ Heterosexual ☐ Homosexual
   ☐ Bisexual ☐ ……..(short answer space)
   ☐ Prefer not to answer
9. Exercise
   ☐ Never
   ☐ Yes (If "Yes", How many day per week?
   ☐ everyday ☐ 1-3 days/week ☐ 4-6 days/week)
10. Dietary or herbal supplements
    ☐ No
    ☐ Yes (If "Yes" please specify type of dietary supplements...../herbal supplements.....)

Part 2 Treatment experience

1. Disclosure of HIV-positive status (You can choose more than 1 answer)
   ☐ Disclose your HIV to anyone
   ☐ Disclose your HIV status to other HIV patient
   ☐ Disclose HIV status to your family
   ☐ Disclose HIV status to physicians
   ☐ ……..(short answer space) ☐ Prefer not to answer
2. How long have you known that you had been HIV tested until now? ..... years
3. Treatment duration: From the time you began antiretroviral therapy until now
   Please specify.....weeks or.....months or.....years

Information within this section will retrieve from medical records of the participants with permission. All information is confidential and protected by privacy laws. Information from medical records will not be released to anyone without participants' authorization.

4. Treatment regimen (at interview date)
   ☐ AZT+3TC+EFV ☐ TENO-EM + EFV
   ☐ AZT+TDF+EFV ☐ TDF+3TC+ EFV
   ☐ GPO-vir Z 250® ☐ TDF+FTC+ EFV (TEEVIR®)
   ☐ TDF+3TC+RPV ☐ Others ……..
5. Any adverse events from medication?
   ☐ No
   ☐ Yes ……..
6. History of opportunistic infections (Answer can choose more than 1 response)

   ☐ Oral thrush ☐ Pneumonia
   ☐ Chronic fever ☐ Tuberculosis
   ☐ Diarrhea ☐ Meningitis
   ☐ Chronic dermatitis ☐ Others (please specify).....

7. Co-morbidities/other chronic diseases
   ☐ No
   ☐ Yes If "Yes" please specify
   ☐ Hypertension
   ☐ Diabetes mellitus

☐ Dyslipidemia
☐ Cardiovascular Disease
☐ Chronic kidney disease
☐ Others (please specify) .....

8. Adherence to antiretroviral therapy (ART)
☐ Take medication regularly
☐ Do not take medication regularly (cause) .....
- Medication adherence (Taking antiviral medications correctly and regularly).....% in the past 6 months

(Received antiretroviral therapy for 180 days, representing 100%.)

9. laboratory results (CD4 cell count, viral load)
- CD4 count when first diagnosed with HIV (before taking ART) ….... cell/mm^3 (.....%)
Date of laboratory testing.....
- Last CD4 count .....cell/mm^3 (.....%)
Date of laboratory testing .....
- Viral load before starting HIV treatment (ART)
(VL =.... copies/ml)
Date of laboratory testing ….
- Last viral load (VL =.....copies/ml)
Date of laboratory testing

Part 3 Self-health care behaviors (57 questions)
Self-health care behaviors in the past 6 months
Please choose one of the most correct answers and mark an X on the answer sheet.

Domain 1 Health responsibilities

1.1 Antiretroviral therapy (11 items)	**Never**	**Sometimes**	**Mostly**	**Every time**
1. How well are you able to recall all of your antiretroviral medication?				
2. How well do you incorporate antiretroviral medication into your daily routine?				
3. How well do you take the antiviral medication as prescribed (the correct dose and correct time)?				
4. How well do you solve the issues that affect your medication adherence?				
5. How well do you recognize the symptoms of opportunistic infection?				
6. How do you manage symptoms of an opportunistic infection?				
7. How do you address the common side-effects of the antiretroviral medication?				
8. What do you do if you experience antiretroviral medication adverse effects (e.g., nausea, vomiting, rash)?				
9. How often do you attend ARV clinic appointments?				
10. How well can you change your behavior in response to HIV test result?				
11. How well can you change your behavior to comply with antiretroviral treatment?				
1.2 Self-protection from other infection (7 items)	**Never**	**Sometimes**	**Mostly**	**Every time**
1. How well can you avoid going to locations that are crowded?				
2. How well can you avoid close contact with people who have respiratory diseases, such as the flu or pulmonary tuberculosis?				
3. How well can you avoid contact with some types of pets (e.g., dogs, cats, birds, and ducks) that may transfer disease to you?				
4. How well can you maintain a clean body by having a daily shower?				
5. How well can you maintain a clean mouth by correctly brushing your teeth every day?				
6. How well can you have healthy toileting behaviors?				
7. How well can you get good sleep every night?				
1.3 Prevention on transmission of HIV infection (6 items)	**Never**	**Sometimes**	**Mostly**	**Every time**
1. How did you use a condom in the previous six months when you had sex?				
2. How many sexual partners have you had since being diagnosed with HIV?				
3. How frequently do you clean blood- and body fluid-contaminated objects with a suitable disinfectant before washing or disposing them?				
4. Do you keep your personal belongings (e.g., nail clippers) separate?				
5. How often do you drink alcohol or alcoholic beverages?				
6. How often do you smoke?				
Domain 2 Physical activities (4 items)	**Never**	**Sometimes**	**Mostly**	**Every time**
1. How effectively do you do everyday activities (e.g., housework, body cleansing, self-eating)?				
2. How frequently do you exercise?				
3. How do you deal with fatigue after exercise?				
4. How frequently do you seek out the appropriate sort of physical activity for yourself?				
Domain 3. Nutrition (7 items)	**Never**	**Sometimes**	**Mostly**	**Every time**
1. How often do you eat healthy food (e.g., grains and flour, meat, fat, veggies and fruits)?				
2. How often do you have meals on schedule?				
3. How often do you eat clean and freshly prepared food?				
4. How frequently do you consume 8-10 glasses of water each day?				
5. How often do you compare your body weight to the prior weighing.				

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Domain 1 Health responsibilities				
6. How frequently do you alter your eating plan in response to variations in your body weight?				
7. How frequently do you consult healthcare provider about dietary issues (e.g., lack of appetite, weight loss)?				
Domain 4. Interpersonal relations (10 items)	**Never**	**Sometimes**	**Mostly**	**Every time**
1. How well do you treat your family?				
2. How frequently do you visit your relatives?				
3. How well do you get along with your friends?				
4. How effectively do you participate in various community activities?				
5. Do you seek advice from family members when you have a life problem?				
6. Do you consult with individuals you trust when you have an issue in your life (e.g., doctors, friends)?				
7. Do you consult with your partner when you are experiencing difficulties in your life?				
8. How frequently do you seek disease and health-care information from health-care workers?				
9. How frequently do you seek information about sickness and health treatment from others who have gone through similar situations as you?				
10. How frequently do you receive assistance from others when you are in need?				
Domain 5. Spiritual growth (7 items)	**Never**	**Sometimes**	**Mostly**	**Every time**
1. How well do you know how to live a life with purpose?				
2. How well do you love and are loved by others?				
3. How well are you able to tolerate the status quo?				
4. How well do you perform chores, study, or work?				
5. How highly do you regard yourself?				
6. How frequently do you participate in religious activities (e.g., visiting the temple, praying, or meditating)?				
7. How frequently do you find a source that boosts your morale?				
Domain 6. Stress management (5 items)	**Never**	**Sometimes**	**Mostly**	**Every time**
1. How effectively do you cope with the stress that can occur?				
2. How well do you relax?				
3. How effectively do you organize your tasks?				
4. How well do you deal with problems and stress?				
5. How often do you seek help when you are unable to solve a problem on your own?				

Part 4 HIV/AIDS-related knowledge

Please choose one of the most correct answers and mark an X on the answer sheet.

Interview topic guide

Questions	True	False	Don't know
1. All people living with HIV must be thin, have dark skinned, with blisters on their skin.			
2. Those infected, although healthy should get their immune system (CD4) screening at least every 6 months.			
3. In the period of being asymptomatic, people living with HIV can transmit if they having unprotected sex.			
4. Having a sexually transmitted illness raises the chance of HIV transmission.			
5. If the mother is HIV positive, then every child will be living with HIV.			
6. Those who are living with HIV must always use condoms.			
7. If the opportunistic infection is cured, it will not be back again.			
8. An opportunistic infectious disease occurs when the body's immune system is lowered			
9. Most people living with HIV die from opportunistic infections			
10. Person living with HIV/AIDS may contract more than one opportunistic infectious disease simultaneously.			
11. All people living with HIV must begin taking antiretroviral medications as soon as they are infected.			
12. If there are adverse reactions to antiviral medication, the patient must take all of the medications and then consult their doctor.			
13. Taking antiretroviral properly is important because non-compliance might lead to drug resistance			
14. The antiviral medication must be administered on a daily basis. However, you can change the eating time as needed each day.			
15. If you believe you are in good health, you should stop taking antiviral medications right away.			
16. Antiviral drugs are medications that prevent the HIV virus from multiplying in the bloodstream, keeping the patient healthy and free of opportunistic infection.			
17. When people living with HIV begin taking antiretroviral medications, these must be continued.			
18. Antiviral medications must be taken every day, on time, and on a consistent basis.			
19. People living with HIV should avoid contracting new infections because this could lead to drug resistance			

Yourself:

1. Could you kindly tell me a little about yourself? (How is your general health?)

Experience with treatment:

2. Could you please share your experience with ART?
   - Medicines - type received, access to medicines, impact of taking medicine on daily living, adherence to medication schedule
   - Facilitators or obstacles to take medication on time

Perspectives and view on self-health care behaviors:

3. Could you briefly describe your self-health care behaviors?
   - Diet, exercise, stress management, and self-protection against risk behaviors
   - How do you cope with stress in your life? Who do you feel is capable of assisting you?

Knowledge

4. Could you kindly tell us about your views on HIV/AIDS?
   - What does the term “HIV/AIDS” mean?
   - How is “HIV/AIDS” transmitted?
   - How should antiretroviral medications be taken?
   - The importance of taking medications on time?
   - Obstacles and difficulties associated with drug administration
   - What does the term “safe sex” mean?

Perspectives and view on career and future prospect

5. How do you feel about your long-term objectives? Will there be any changes, in terms of education, career, or status?

Perspectives and view on health care systems

6. Please describe the health care service model, consulting clinic, or improvement of service that you require, as well as any additional government assistance or social support requirements.

Distribute or advise other youth

7. What would you like to share/advise youth who are not living with HIV?

Appendix 2

The mean scores of the six self-health care behavior domains

Domain	$\bar{x}$	S.D.	Level
1. **Health responsibilities**			
Antiretroviral therapy (11 items)			
1. How well are you able to recall all of your antiretroviral medication?	3.36	0.95	good
2. How well do you incorporate antiretroviral medication into your daily routine?	3.77	0.43	excellent
3. How well do you take the antiviral medication as prescribed (the correct dose and correct time)?	3.77	0.43	excellent
4. How well do you solve the issues that affect your medication adherence?	3.64	0.66	excellent
5. How well do you recognize the symptoms of opportunistic infection?	3.05	1.00	good
6. How do you manage symptoms of an opportunistic infection?	3.00	0.98	good
7. How do you address the common side-effects of the antiretroviral medication?	3.45	0.74	good
8. What do you do if you experience antiretroviral medication adverse effects (e.g., nausea, vomiting, rash)?	3.00	0.98	good
9. How often do you attend ARV clinic appointments?	3.86	0.35	excellent
10. How well can you change your behavior in response to HIV test result?	3.73	0.55	excellent
11. How well can you change your behavior to comply with antiretroviral treatment?	3.50	0.51	excellent
Self-protection from other infection (7 items)			
1. How well can you avoid going to locations that are crowded?	2.77	0.81	good
2. How well can you avoid close contact with people who have respiratory diseases, such as the flu or pulmonary tuberculosis?	3.09	0.75	good
3. How well can you avoid contact with some types of pets (e.g., dogs, cats, birds, and ducks) that may transfer disease to you?	2.27	0.83	fair
4. How well can you maintain a clean body by having a daily shower?	3.68	0.48	excellent
5. How well can you maintain a clean mouth by correctly brushing your teeth every day?	3.73	0.55	excellent
6. How well can you have healthy toileting behaviors?	3.64	2.91	excellent
7. How well can you get good sleep every night?	2.91	2.14	good
Prevention on transmission of HIV infection (6 items)			
1. How did you use a condom in the previous six months when you had sex?	2.95	1.21	good
2. How many sexual partners have you had since being diagnosed with HIV?	2.91	0.97	good
3. How frequently do you clean blood- and body fluid-contaminated objects with a suitable disinfectant before washing or disposing them?	3.00	0.93	good
4. Do you keep your personal belongings (e.g., nail clippers) separate?	2.91	1.31	good
5. How often do you drink alcohol or alcoholic beverages?	2.73	1.20	good
6. How often do you smoke?	3.59	0.73	excellent
Mean score for health responsibilities domain	**3.26**	**0.43**	**good**

(continued)

Domain	$\bar{x}$	S.D.	Level
Physical activities (4 items)			
1. How effectively do you do everyday activities (e.g., housework, body cleansing, self-eating)?	3.50	0.60	excellent
2. How frequently do you exercise?	2.00	1.20	fair
3. How do you deal with fatigue after exercise?	3.41	0.80	good
4. How frequently do you seek out the appropriate sort of physical activity for yourself?	2.55	1.10	good
Mean score for physical activities domain	**2.87**	**0.72**	**good**
3. **Nutrition (7 items)**			
1. How often do you eat healthy food (e.g., grains and flour, meat, fat, veggies and fruits)?	2.91	0.87	good
2. How often do you have meals on schedule?	2.50	0.96	good
3. How often do you eat clean and freshly prepared food?	3.27	0.94	good
4. How frequently do you consume 8-10 glasses of water each day?	3.27	0.77	good
5. How often do you compare your body weight to the prior weighing.	3.50	0.80	excellent
6. How frequently do you alter your eating plan in response to variations in your body weight?	3.18	0.85	good
7. How frequently do you consult healthcare provider about dietary issues (e.g., lack of appetite, weight loss)?	2.91	1.27	good
Mean score for nutrition domain	**3.08**	**0.33**	**good**
4. **Interpersonal relations (10 items)**			
1. How well do you treat your family?	3.55	0.67	excellent
2. How frequently do you visit your relatives?	3.41	0.85	good
3. How well do you get along with your friends?	3.36	0.90	good
4. How effectively do you participate in various community activities?	2.91	1.27	good
5. Do you seek advice from family members when you have a life problem?	2.64	1.05	good
6. Do you consult with individuals you trust when you have an issue in your life (e.g., doctors, friends)?	2.68	1.17	good
7. Do you consult with your partner when you are experiencing difficulties in your life?	2.77	1.23	good
8. How frequently do you seek disease and health-care information from health-care workers?	3.09	1.06	good
9. How frequently do you seek information about sickness and health treatment from others who have gone through similar situations as you?	2.68	1.09	good
10. How frequently do you receive assistance from others when you are in need?	3.41	0.73	good
Mean score for interpersonal relations domain	**3.05**	**0.36**	**good**

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Domain	$\bar{x}$	S.D.	Level
5. **Spiritual growth (7 items)**			
1. How well do you know how to live a life with purpose?	3.50	0.80	excellent
2. How well do you love and are loved by others?	3.55	0.67	excellent
3. How well are you able to tolerate the status quo?	3.36	0.66	good
4. How well do you perform chores, study, or work?	3.45	0.80	good
5. How highly do you regard yourself?	3.41	0.80	good
6. How frequently do you participate in religious activities (e.g., visiting the temple, praying, or meditating)?	2.91	0.92	good
7. How frequently do you find a source that boosts your morale?	3.27	0.98	good
Mean score for spiritual growth domain	**3.35**	**0.21**	**good**
6. **Stress management (5 items)**			
1. How effectively do you cope with the stress that can occur?	3.27	0.66	good
2. How well do you relax?	3.36	0.96	good
3. How effectively do you organize your tasks?	2.91	0.87	good
4. How well do you deal with problems and stress?	3.32	0.84	good
5. How often do you seek help when you are unable to solve a problem on your own?	2.64	0.73	good
Mean score for stress management domain	3.10	0.31	good
Mean score for self-health care behaviors	**3.17**	**0.41**	**good**