ARAŞTIRMA / RESEARCH

Effects of chronic illness adaptation on the healthy lifestyle behaviours of patients in internal services

Dahili servislerde yatan hastaların kronik hastalıklara uyumunun sağlıklı yaşam biçimi davranışları üzerine etkisi

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Abstract

Purpose: This descriptive study investigated the effects of chronic illness adaptation on the healthy lifestyle behaviours of patients in internal services.

Materials and Methods: The research was conducted with 104 inpatients at the Bingöl State Hospital. No sampling method was used in the study. A descriptive information form was utilised to record the patients' sociodemographic characteristics. The Adaptation to Chronic Illness Scale (ACIS) and the Healthy Lifestyle Behavior Scale-II (HLBS-II) were used to collect the data on their adaptation and behaviour levels.

Results: The patients' total mean ACIS score was 84.99±12.45, meaning that their adaptation to chronic illness was above average. Moreover, since their total mean HLBS-II score was 130.27±24.50, their adaptation to healthy lifestyle behaviours was moderate. The patients' adaptation to chronic illness positively affected their healthy lifestyle behaviours (B=1.045), and this result was statistically significant.

Conclusion: Chronic illness adaptation positively influenced healthy lifestyle behaviours.

Keywords:. Chronic disease, adaptation to illness, healthy lifestyle

Öz

Amaç: Bu araştırma, kronik hastalığı olan bireylerin kronik hastalıklarına uyumlarının, sağlıklı yaşam biçimi davranışları üzerine etkisini değerlendirmek amacıyla yapılmıştır.

Gereç ve Yöntem: Araştırmanın yürütüldüğü zaman aralığında dahili kliniklerde yatan ve araştırma kriterlerini karşılayan 104 hasta ile araştırma yürütülmüştür. Verilerin toplanmasında hastaların sosyo-demografik özelliklerini değerlendiren "Tanıtıcı Bilgi Formu", "Kronik Hastalıklara Uyum Ölçeği (KHUÖ)" ve "Sağlıklı Yaşam Biçimi Davranışları Ölçeği II (SYBDÖ)" kullanılmıştır.

Bulgular: Hastaların KHUÖ toplam puan ortalamasının 84.99±12.45 olduğu ve hastaların kronik hastalıklara uyumunun ortalamanın üzerinde olduğu görülmüştür. Hastaların SYBDÖ toplam puan ortalaması ise 130.27±24.50 bulunmuş ve hastaların sağlıklı yaşam biçimi davranışlarını benimseme düzeylerinin ortalama düzeyde olduğu belirlenmiştir. Hastaların kronik hastalıklara uyumunun sağlıklı yaşam biçimi davranışlarını benimseme düzeyi üzerine pozitif yönde etkili olduğu (B=1.045) ve istatistiksel olarak sonucun önemli olduğu saptanmıştır.

Sonuç: Hastaların kronik hastalıklara uyumunun sağlıklı yaşam biçimi davranışlarını benimseme düzeyi üzerine pozitif yönde etkili olduğu bulunmuştur.

Anahtar kelimeler: Kronik hastalık, hastalığa uyum, sağlıklı yaşam biçimi

INTRODUCTION

Chronic diseases lead to the gradual impairment of physiological functions, last for a long time (at least three months), involve irreversible changes and may require ongoing medical attention or limit the activities of daily living[1]. Notably, these diseases adversely affect the physical, psychological, social, cultural and spiritual dimensions that encompass an individual's integrity[2]. Many people with chronic diseases experience changes in their daily living activities and social and familial relationships, body image disturbance, reduced quality of life, reduced ability to cope and increased fear of death[3]. Furthermore, these diseases may negatively influence their eating habits, work life and relationships and also trigger physical and psychological symptoms such as pain, fatigue, fear and stress[4]. Therefore, because effective management of chronic conditions is vital, patients must understand, accept and adapt to all changes caused by their chronic illnesses[5].

Adaptation is an important component of chronic disease management. It refers to the process of an individual acknowledging the different situations that arise from their internal and external environments. Additionally, adaptation expresses one's ability to display appropriate behaviours and attitudes during this process[6]. Adaptation to an illness includes the patient's application of the prescribed diet, their drug use and recommended lifestyle modifications[7].

Because well-being is now synonymous with a healthy lifestyle, patients should adopt and maintain behaviours that encourage such a lifestyle[8]. Individuals with a healthy lifestyle control the behaviours and attitudes that affect their health and both select and apply health-promoting behaviours in their daily lives. Healthy lifestyle behaviours include maintaining balanced and healthy nutrition habits, engaging in regular physical activity, managing stress, doing activities that support spiritual growth and keeping interpersonal relationships alive[9]. Significantly, changes in healthy lifestyle behaviours among individuals with chronic diseases positively affect their management of the related symptoms.

To protect and improve the health of individuals with chronic diseases, several health behaviours must be changed at the same time[10]. Michishita et al. followed middle-aged and elderly men for five years, and they found that some participants' healthy lifestyle behaviours, especially those who exercised lightly and did not snack before going to sleep, reduced their risk of chronic kidney disease[11]. Likewise, many studies revealed that lifestyle modifications, such as diet and physical activity, were effective in preventing diabetes[12,13]. Other showed that healthy lifestyle behaviours were important to enhancing the quality of life of patients undergoing hemodialysis[14].

Following the literature, modifications to healthy lifestyle behaviours are critical to the management of chronic diseases. Moreover, patients' perception of and adaptation to chronic illness are vital to their adoption of these behaviours. However, the literature has not investigated the effect of chronic illness adaptation on healthy lifestyle behaviours. Given the growing number of chronic diseases, it is important to fill this research gap. Hence, this study examined the effects of chronic illness adaptation on the healthy lifestyle behaviours of inpatients at a hospital.

MATERIALS AND METHODS

Sample

This descriptive study was carried out at the Bingöl State Hospital between October 2019 and May 2020. This study's population consisted of 104 inpatients in the internal clinics (e.g. internal medicine, endocrine and nephrology clinics) of the Bingöl State Hospital who were hospitalised during the study period. This study did not use a sampling method. The data collection stage was prolonged due to the COVID-19 pandemic. This study included individuals who had been diagnosed with at least one chronic disease by a physician, had no communication problems and volunteered to participate in the research. Furthermore, this study excluded individuals who were diagnosed with any psychiatric disease or dementia and who were placed into contact isolation.

Data collection

The researchers obtained written consent from the Bingöl Provincial Directorate of Health and ethical approval (decision number: 26.09.2019-E.1937) from the Committee on Publication Ethics of Bingöl University. Moreover, the researchers informed the participants that they were free to participate in the study, and they instructed the participants on its purpose and how its results would be used. The researchers also obtained their verbal or written consent prior to data collection.

This study used three different data collection forms: a descriptive information form, the Adaptation to

Chronic Illness Scale (ACIS) and the Healthy Lifestyle Behavior Scale-II (HLBS-II). The researchers collected the data using face-to-face interviews while visiting the internal clinics. The researchers informed the participants of the study and obtained their verbal/written consent prior to data collection.

The researchers distributed the data collection forms to the participants and granted them the required time (10–15 minutes) to fill these forms out. For illiterate participants, a researcher read the questions aloud and marked their answers on the forms. In many previous studies, researchers asked illiterate individuals one-to-one questions that involved scales and marked their answers on the relevant forms[5, 14, 30, 36, 37]. In fact, since the questions contained in some scales are difficult to understand, the questions can be read by the researchers, the necessary explanations are made, and the answers given by the participants can be marked on the forms. Questions on all subjects except the special situation of the participants such as sexual life can be read to the participants and the answers can be recorded in the forms.

Measures

Descriptive Information Form

The researchers created a descriptive information form to collect data on the participants' sociodemographic characteristics. The form consists of seven items that address age, gender, marital status, educational status, income level, present chronic disease and time of diagnosis.

Adaptation to Chronic Illness Scale (ACIS)

Atik and Karatepe developed the ACIS in 2016[6]. This 5-point Likert-type scale has 25 items and three subscales: physical adaptation, social adaptation and psychological adaptation. The scale ranges from 1 (strongly disagree) to 5 (strongly agree). The negative items are reverse scored. The highest score is 125. High subscale and overall scores reflect a high level of patient adaptation to a disease[6]. The Cronbach's alpha value was found to be 0.88 for the original scale[6], whereas it was determined to be 0.90 in this study.

Healthy Lifestyle Behaviour Scale II (HLBS-II)

Pender et al.[15] developed the HLBS-II, and Bahar et al.[16] adapted it into Turkish. This 4-point Likert-type scale consists of 52 items and uses six sub-

dimensions: health responsibility, physical activity, nutrition, spiritual development, interpersonal relations and stress management. The lowest score on the scale is 52, and the highest is 208. There is no specified cut-off value for the total mean score obtained from the scale. A high total score indicates that the individual applied the specified health behaviours at a high level. The Cronbach's alpha internal consistency coefficient was previously reported as 0.92[16] for the original HPLP-II, whereas it was determined to be 0.90 in this study.

Statistical analysis

This study used the total HLBS-II score as its dependent variable and the demographic characteristics and the total ACIS score as its independent variables.

The researchers analysed the data using the IBM SPSS 22.0 package program. Sociodemographic characteristics and scale mean scores were expressed with numbers, percentages, means and standard deviations. The Cronbach's alpha internal consistency coefficient was calculated to assess the internal consistency of the scales. The compliance of the data with the normal distribution was evaluated with the Kolmogorov-Smirnov test. Non-parametric tests (i.e. the Kruskal-Wallis H test and the Mann-Whitney U test) were applied to non-normally distributed variables. The T-test was performed in independent groups for binary groups that fit the normal distribution. Correlation analysis was performed to evaluate the relationship between the scale mean scores. Linear regression (enter model) was used to analyse the effect of adaptation on healthy lifestyle behaviours. The significance level was set to $p<0.05$.

RESULTS

Table 1 shows the sociodemographic characteristics of the participants. Their mean age was 52.9±17.7 years, their time of diagnosis was 9.6±4.5 years, 53.8% were female, 80.8% were married, 26.9% were illiterate, 51.9% had a middle-income level and 45.2% were diagnosed with diabetes (Table 1).

Table 2 displays the mean ACIS and HLBS-II scores of the participants. Their total mean ACIS score was 84.99±12.45. Their mean scores for the subscales of physical adaptation, social adaptation and psychological adaptation were 41.75±5.78,

21.14±5.22 and 22.09±4.54, respectively. Considering that the maximum ACIS score was 125, the participants' chronic illness adaptation was satisfactory. The participants' total mean HLBS-II score was 130.27±24.50. Their total mean scores for the sub-dimensions were as follows: 22.42±5.77 for

health responsibility, 15.36±4.98 for physical activity, 21.55±4.39 for nutrition, 25.00±5.21 for spiritual development, 26.25±5.25 for interpersonal relations and 19.67±4.60 for stress management (Table 2). Hence, their adaptation to healthy lifestyle behaviours was moderate

Table 1. The participants' sociodemographic characteristics

Socio-demographic variables		Number (N)	Percentage (%)
Age X±SD 52.9±17.7			
Time of diagnosis 9.6±4.5			
Gender	Female	56	53.8
	Male	48	46.2
Marital Status	Single	20	19.2
	Married	84	80.8
Educational Status	Illiterate	28	26.9
	Literate	15	14.4
	Primary	24	23.1
	Secondary	18	17.3
	Higher Education	19	18.3
Income Level	High	33	31.7
	Middle	54	51.9
	Low	17	16.3
Present Chronic Disease*	Diabetes	47	45.2
	Hypertension	41	39.4
	Chronic Renal Failure	16	15.4
	Asthma/COPD	14	13.5
	Other	33	31.7

* Questions were answered with more than one answer, and percentages were calculated over those marking the 'Yes' option.

Table 2. The participants' mean ACIS and HLBS-II scores

	Min-Max	X-SD
Physical adaptation	24.0-52.0	41.75±5.78
Social adaptation	7.0-34.0	21.14±5.22
Psychological adaptation	10.0-34.0	22.09±4.54
Adaptation to Chronic Illness Scale Total	45.0-117.0	84.99±12.45
Health responsibility	9.0-36.0	22.42±5.77
Physical activity	8.0-29.0	15.36±4.98
Nutrition	12.0-31.0	21.55±4.39
Spiritual development	12.0-35.0	25.00±5.21
Interpersonal relations	12.0-34.0	26.25±5.25
Stress management	10.0-31.0	19.67±4.60
Healthy Lifestyle Behavior Scale II Total	66.0-195.0	130.27±24.50

X: Mean, SD: Standard Deviation

The ACIS had a moderate positive significant correlation with the HLBS-II ($r=0.531$, $p<0.001$). Likewise, HLBS-II had moderate positive significant correlations with the physical adaptation, social adaptation and psychological adaptation subscales

($r=0.523$, $p<0.001$; $r=0.395$, $p<0.001$ and $r=0.336$, $p<0.001$, respectively) (Table 3). Our results showed that individuals with a high chronic illness adaptation level also applied their specified health behaviours at a high level.

Table 3. The correlation between the mean scores of the ACIS and the HLBS-II

	Health responsibility	Physical activity	Nutrition	Spiritual growth	Interpersonal Relations	Stress management	HLBS-I Total
Physical adaptation	r:.482** p=.000	r:.442** p=.000	r:.395** p=.000	r:.505** p=.000	r:.302** p=.002	r:.406** p=.000	r:.523** p=.000
Social adaptation	r:.266** p=.006	r:.251* p=.010	r:.309** p=.001	r:.465** p=.000	r:.385** p=.000	r:.239* p=.014	r:.395** p=.000
Psychological adaptation	r:.216* p=.027	r:.214* p=.029	r:.229* p=.020	r:.411** p=.000	r:.318** p=.001	r:.239* p=.015	r:.336** p=.000
ACIS Total	r:.414** p=.000	r:.389** p=.000	r:.396** p=.000	r:579** p=.000	r:.418** p=.000	r:.376** p=.000	r:.531** p=.000

*$p<0.05$, **$p<0.001$, r: Correlation coefficient

This study used regression analysis to examine the effect of chronic illness adaptation on healthy lifestyle behaviours. Our results demonstrated that adaptation had a positive effect on healthy lifestyle behaviours (B=1.045). Furthermore, this study determined that 28.2% of the total variance of the HLBS-II dependent variable was explained by the total ACIS score. This result was also statistically significant (R=0.531, R^2=0.282, $p<0.001$).

Table 4. The regression analysis of the effect of chronic illness on healthy lifestyle behaviours

	Unstandardized Coefficients		Standardized Coefficients						
Model	B	SE	Beta	t	Sig.	F	Sig	R	R^2
Constant	41.451	14.179		2.923	.004				
ACIS Total	1.045	.165	.531	6.331	**.000**	40.084	.000[b]	.531[a]	**.282**

a. Dependent variable: HLBS-II Total
b. Predictors: (Constant): ACIS Total

Table 5 displays a comparison of the sociodemographic variables and the mean ACIS and HLBS-II scores. The results showed that age and time of diagnosis had negative and very poor correlations with the ACIS and the HLBS-II ($p>0.05$). Time of diagnosis had a moderate significant correlation with the psychological adaptation subscale ($p<0.05$). Moreover, as the participants' time of diagnosis increased, their psychological adaptation decreased. This study also identified significant negative poor correlations between time of diagnosis and the physical adaptation and stress management subscales ($p<0.05$). Participants with a longer time of diagnosis had reduced physical activity and stress management levels. In addition, this study found statistically insignificant differences between gender and both the ACIS and HLBS-II ($p>0.05$). In contrast, the difference between gender and the psychological adaptation subscale was statistically significant ($p<0.05$).

Our results highlighted that differences between marital status and both the ACIS and the HLBS-II were statistically significant ($p<0.05$). Overall, married participants adapted better to their chronic illnesses. The differences between marital status and the spiritual development, interpersonal relations and stress management subscales were statistically significant ($p<0.05$). Married participants had higher levels of adaptation to healthy lifestyle behaviours, and they also obtained higher scores on the HLBS-II and all its subscales than single participants.

Our results showed that the differences between educational status and the ACIS and social adaptation subscale were statistically significant ($p<0.05$). Participants with high education levels had high levels of chronic illness adaptation. In addition, our results suggested that educational status and the HLBS-II had statistically significant differences with the physical activity, nutrition, spiritual development and stress management subscales ($p<0.05$). Thus, participants with high educational levels also applied their specified health behaviours at high levels.

This study found that the differences between income level and the ACIS and social adaptation subscale were statistically significant (p<0.05). Participants with good incomes adapted well to their chronic illnesses. Further, this study identified that the difference between income and the HLBS-II was statistically insignificant (p>0.05). However, participants with moderate or good incomes had high HLBS-II mean scores. In addition, the results demonstrated statistically significant differences between income level and both the physical activity and spiritual growth subscales (p<0.05) (Table 5).

Table 5. Comparison of the socio-demographic characteristics of the patients and their mean scores regarding the ACIS and its subscales, HLBS-II and its subscales

Variables	Physical adaptation	Social adaptation	Psychological adaptation	ACIS Total	Health responsibility	Physical activity	Nutrition	Spiritual development	Interpersonal relations	Stress management	HLBS-II Total
Age	r=.133 p=.177	r=-.104 p=.291	r=-.100 p=.313	r=-.018 p=.854	r=.083 p=.400	r=-.016 p=.874	r=.188 p=.056	r=-.041 p=.682	r=-.025 p=.804	r=-.129 p=.193	r=-.012 p=.903
Time of Diagnosis	r=-.048 p=.628	r=-.051 p=.607	r=-.309 p=.001*	r=-.156 p=.113	r=-.124 p=.211	r=-.206 p=.034*	r=.098 p=.324	r=-.066 p=.504	r=-.055 p=.580	r=-.252 p=.010*	r=-.127 p=.200
Gender											
Female	41.6±5.7	21.3±5.3	23.1±4.2	86.2±11.8	22.0±5.9	14.9±4.9	21.2±4.3	24.7±5.3	26.6±5.1	19.2±4.7	128.9±24.2
Male	41.8±5.9	20.8±5.0	20.8±4.6	83.5±13.0	22.8±5.6	15.8±5.0	21.9±4.4	25.2±5.0	25.7±5.4	20.1±4.4	131.7±24.9
	t=-.203 p=.840	t=.485 p=.629	t=2.752 p=.007*	t=1.083 p=.281	t=-.635 p=.527	t=-1.004 p=.318	t=-.769 p=.444	t=-.471 p=.639	t=.935 p=.352	t=-1.012 p=.314	t=-.581 p=.563
Marital Status											
Single	39.8±7.3	16.5±6.3	20.2±4.8	76.6±16.9	19.0±8.2	14.0±5.0	20.0±5.9	20.4±7.1	21.3±6.6	17.3±4.9	112.2±33.5
Married	42.2±5.3	22.2±4.2	22.5±4.3	86.9±10.2	23.2±4.7	15.6±4.9	21.9±3.8	26.0±3.9	27.4±4.1	20.2±4.3	134.5±19.7
	Z=-1.161 p=.245	Z=-3.925 p=.000*	Z=-1.856 p=.063	Z=-2.951 p=.003*	Z=-2.162 p=.031	Z=-1.377 p=.168	Z=-1.291 p=.197	Z=-3.219 p=.001*	Z=-3.734 p=.000*	Z=-2.332 p=.020*	Z=-2.764 p=.006*
Educational Status											
Illiterate	39.3±5.9	18.7±5.6	21.3±3.6	79.4±10.5	20.6±6.0	13.5±4.3	20.3±4.0	21.6±5.2	25.3±6.3	16.8±4.1	118.3±23.4
Literate	43.4±2.5	19.6±2.9	20.6±2.7	83.7±6.3	22.3±2.6	16.2±3.7	19.2±2.8	25.0±2.5	26.0±2.5	20.8±2.5	128.6±10.0
Primary	42.7±5.3	23.0±4.3	24.5±4.5	89.4±11.2	23.8±4.5	14.5±4.9	23.2±2.4	26.8±3.6	28.0±3.8	20.5±3.6	137.0±17.3
Secondary	40.7±7.7	20.6±5.8	21.5±4.7	82.9±16.3	20.6±7.1	14.8±3.7	21.3±5.7	24.7±5.9	23.6±6.1	19.5±3.6	129.7±27.8
Higher education	43.5±4.8	23.8±4.6	21.8±5.8	90.2±12.7	25.1±6.0	18.8±6.2	23.9±4.5	27.8±5.2	28.0±4.6	21.9±6.3	145.8±28.9
	x²=7.416 p=.115	x²=15.548 p=.004*	x²=9.236 p=.055	x²=13.843 p=.008*	x²=8.433 p=.077	x²=12.907 p=.012*	x²=22.796 p=.000*	x²=19.115 p=.001*	x²=8.691 p=.069	x²=14.819 p=.005*	x²=15.631 p=.004*
Income Level											
High	43.3±5.3	21.7±6.2	21.7±4.9	86.9±14.3	22.7±6.7	15.9±4.7	23.0±4.9	25.2±4.8	25.4±5.4	19.9±4.6	130.6±26.1
Middle	42.2±5.0	21.7±4.1	22.8±4.1	86.9±9.0	23.0±4.7	16.7±4.7	21.3±3.4	25.8±4.8	27.1±4.6	19.9±4.5	134.0±20.9
Low	36.4±6.0	17.9±5.3	20.4±4.8	74.8±13.4	19.8±6.2	13.1±4.0	19.4±5.2	21.8±5.8	25.0±6.3	18.4±4.8	117.7±28.7
	x²=14.288 p=.001*	x²=7.164 p=.028	x²=.646 p=.724	x²=12.326 p=.002*	x²=1.555 p=.460	x²=10.008 p=.007*	x²=5.980 p=.050	x²=7.409 p=.025*	x²=1.931 p=.381	x²=1.196 p=.550	x²=5.146 p=.076

r: correlation coefficient, t: independent samples t-test, Z: Mann-Whitney U test, x²: Kruskal-Wallis H test

DISCUSSION

The present study examined the effects of chronic illness adaptation on the healthy lifestyle behaviours of patients in internal services. This study determined that the participants had good levels of adaptation, with a total ACIS score of 84.99±12.45. This finding is consistent with the results of Karatepe et al. (83.03±10.58). They found higher levels of physical chronic illness adaptation than this study did[17]. Moreover, Yılmaz and Kara also reported above-average chronic illness adaptation levels (84.57±14.25)[5]. Similarly, Atik and Güngör noted that haemodialysis patients had above-average

general and physical chronic-disease adaptation levels and medium social and psychological adaptation levels (85.32±14.50)[34]. Likewise, one study conducted on patients hospitalised in a cardiology clinic reported a total ACIS score of 76.80±10.94[35]. Thus, this study's findings are consistent with the literature. Following its results, patients with chronic illnesses need high adaptation levels for effective illness management.

This study determined that chronic illness adaptation was an effective factor in healthy lifestyle behaviours. A high adaptation level indicated that a given individual also applied their specified health behaviours at a high level. Focusing on patients with hypertension, Erci et al. concluded that as their adaptation to therapy increased, their quality of life also increased[18]. Furthermore, Kapucu and Çalık emphasised the importance of healthy lifestyle behaviours in patients struggling with chronic conditions, and they stated that healthy lifestyle behaviours are important for diabetic patients to adapt to the disease[19]. Many studies have argued that the course of the disease is positively affected in patients who adapt to healthy lifestyle behaviors[20,21,22]. Therefore, this study asserts that individuals with chronic illnesses should increase their adaptation levels and be informed about their disease, their symptoms and the relevant healthy lifestyle behaviours.

This study identified a negative very poor correlation between age and adaptation, but this correlation was also statistically insignificant. Regardless, elderly patients were found to have lower adaptation levels than younger patients. Targeting patients with chronic obstructive pulmonary disease, Yuet identified that psychosocial adjustment to illness was worse in elderly patients[23]. Additionally, Yılmaz and Kara revealed that as age increased, adaptation to illness decreased[5]. They found that patients with a longer time of diagnosis had lower adaptation levels. As chronic diseases progress, they increase physical symptoms, cognitive and functional losses, social and psychological problems and care dependency. These factors negatively affect illness adaptation[24]. Hence, this study suggests that weakened coping mechanisms due to increased age and longer time of diagnosis as well as increased symptom frequency may negatively affect adaptation.

This study found statistically significant differences between the ACIS and marital status, educational status and income level. Gender did not create a significant difference. Patients who were married with high education and income levels also had high adaptation levels. Yılmaz and Kara determined that sociodemographic variables such as age, educational status, perceived income level and time of diagnosis were factors that influenced chronic illness adaptation[5]. Further, Karatepe et al. found a statistically significant difference between educational status and physical adaptation to chronic illness, and they reported that high school and university graduates had higher levels of physical adaptation than participants with lower education levels[17]. According to a study that graded the health status of individuals with chronic diseases in Malaysia, individuals who were over 60 years of age, female, divorced and unemployed had worse health than their peers[22]. Likewise, one study on individuals with chronic diseases revealed that the drug compliance of married participants was higher than that of single participants[25]. In general, the high adaptation levels of married participants may be due to the social and care support that they receive from their families. Following the literature, illness adaptation may be facilitated by higher educational status and income levels, increased sources of information, increased opportunities to receive professional care and education and easier access to healthcare services.

This study determined that the participants' levels of adaptation to healthy lifestyle behaviours were average. Their total mean HLBS-II score (130.27±24.50) is in line with the results of Savaşan et al., who focused on patients with coronary artery disease[26]. One study on prostate cancer patients revealed that their adaptation to healthy lifestyle behaviours was moderate[27]. In the present study, the HLBS-II subscales' scores indicated that the participants' interpersonal relations were good, whereas their physical activity levels were low. This finding is consistent with the results of Gömleksiz et al., who studied medical faculty students[28]. One study examined the healthy lifestyle behaviours of healthcare professionals, and it determined that the participants had their highest scores on the spiritual development subscale, while their lowest scores were on the physical activity subscale[29]. Ultimately, the present study's adaptation levels regarding healthy lifestyle behaviours are consistent with the literature.

This study found statistically significant differences between the mean HLBS-II score and both marital status and educational status. Married participants with a high educational status were found to

effectively adopt healthy lifestyle behaviours. Küçükberber et al. determined that the total HLBS scores of married participants were higher than those of single participants[30]. Likewise, Özkaraman et al. conducted a study of patients receiving haemodialysis treatment and concluded that compared to single patients, married patients more frequently adopted healthy lifestyle behaviours[31].A study on cardiac patients revealed that those who were male, married, aged between 49–60 years, had an educational status of bachelor's degree and above, had a good socioeconomic status and had no comorbidities exhibited healthy lifestyle behaviors[30]. Plus, a study on healthcare workers indicated that there was a significant difference between the healthy lifestyle behaviour scale and variables such as marital status, age, unit, exercise status and income level[29].

According to the literature, illiterate individuals adopt healthy lifestyle behaviours less frequently than those who are literate. Presumably, limited access to educational materials and difficulties in reading written materials may impact the low mean lifestyle behaviour scores of patients with low education levels. In a recent study conducted on individuals with chronic diseases in Taiwan, participants with an educational status of university or above had better health than those with a secondary or lower educational status. The study also observed that individuals with a higher educational status had a better health status than their peers[10]. In addition, Softa et al.,[36] Polat and Kahraman[37] and Kulakçı et al.[38] claimed that the difference between education level and the total score of healthy lifestyle behaviours was statistically significant. Overall, married patients with a high educational status, easy access to sources of information and social support granted by their families are expected to effectively adapt to healthy lifestyle behaviours.

Lastly, this study identified statistically insignificant differences between the mean HLBS-II score and age, gender, time of diagnosis and income level. Male patients who reported moderate income levels had higher mean HLBS-II scores than other patients. This is consistent with the results of Küçükberber et al.,[30] Özkaraman et al.,[31] Sungur et al.[32] and Kılınç et al.,[33]. Women may have lower levels of adaptation to healthy lifestyle behaviours because they utilise fewer social opportunities and have more chronic comorbidities than men. Additionally, this study found significant differences between income level and the physical activity and spiritual development subscales.

This study has several limitations. Because the data used in this study were collected from one public hospital, the generalisability of its results is limited. Moreover, since the data collection process coincided with the COVID-19 pandemic, it was difficult to reach patients. Most importantly, the researchers needed to ask illiterate individuals one-to-one questions and mark their answers on the forms, which may have affected the real answers and caused data loss. However, to identify the problems of illiterate individuals and produce solutions, they should be included in surveys. Otherwise, their problems will be ignored, which is contrary to research ethics.

This study determined that chronic illness adaptation positively influenced healthy lifestyle behaviours. Following the results, the participants had satisfactorily adapted to their chronic conditions, while their use of healthy lifestyle behaviours was moderate. The ACIS and the HLBS scores had statistically significant differences with the variables of marital status, educational status and income level.

In line with these results, this study recommends that nurses provide education and counselling to patients with chronic diseases, as this will increase their adaptation. In addition, patients should be reminded of the importance of healthy lifestyle behaviours, which are closely associated with adaptation. Furthermore, family members should be made aware of healthy lifestyle behaviours and chronic illness adaptation. This study also suggests that health-promotion programmes should target women, at-risk seniors, patients who were diagnosed a long time ago and individuals with low education and income levels. This should be done while prioritising the use of community resources.

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