Research Article

Exercise and Personal Income Level are Independently Associated with Health-Related Quality of Life in Patients with Newly Diagnosed Stable Angina

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Abstract

Objective: The aim of this study was to explore risk factors associated with HRQL in patients with newly diagnosed stable angina.

Methods: A cross-sectional survey was conducted with 342 consecutive outpatients with newly diagnosed stable angina. Physical and mental HRQL were evaluated via the 36-item Short-Form Health Survey. Multiple stepwise regression was performed to determine the factors associated with HRQL.

Results: Patients who were older, were females, did not exercise, and had lower educational levels, lower monthly incomes, smoking/drinking habits, diabetes, hypertension, and hyperlipemia showed low physical HRQL scores, while those who were older with lower educational levels and monthly incomes showed low mental HRQL scores. The results of multiple stepwise regression showed that physical and mental HRQL were positively correlated with exercise and monthly income and negatively associated with age. Sleep quality and drinking were negatively associated with physical, but not mental, HRQL.

Conclusions: Our findings indicated that exercise and personal income level, as modifiable factors, were positively associated with both physical and mental HRQL. These findings could have implications for clinical suggestions and strategies to improve HRQL in patients with stable angina.

Keywords: coronary outpatients; exercise; health-related quality of life; monthly income

Introduction

Coronary Artery Disease (CAD) is the most common clinical type of Cardiovascular Disease (CVD), which is the leading cause of morbidity and disability worldwide [1]. Because of considerable advances in the treatment and management of CAD in recent decades, the number of CAD patients in low- and middle-income countries continues to increase [2]. Moreover, some research has shown that patients with CAD exhibited poor Health-Related Quality of Life (HRQL) [3], which is an important indicator in evaluating patient-centered health outcomes, the impact of disease burden, and the effectiveness of treatment interventions. Nevertheless, evidence regarding factors associated with HRQL in CAD patients using outpatient services is lacking, particularly with respect to common factors in daily life.

HRQL is a self-reported outcome of individual health and well-being including subjective symptoms, general health, functional status, and satisfaction with life [4]. Based on the notion that health is more than the absence of disease, HRQL evaluation has become a major public topic over recent decades. According to the latest research, age, chronic disease, health services, medical insurance, education, economic status, and physical exercise are the main factors influencing HRQL in the general population; in particular, age and disease are independent risk factors [5]. However, the factors that influence HRQL in CAD outpatients and the issue as to whether they are consistent in both physical and mental HRQL remain unclear.

Therefore, the current study aimed to assess the associations between these factors and HRQL and explore predictive relationships in CAD outpatients. The findings could provide valuable evidence for medical decision-making in the development of strategies to improve HRQL in CAD outpatients.

Materials and Methods

Study design and sample: We conducted a cross-sectional survey between March 15, 2018 and September 30, 2018, with 342 consecutive outpatients with stable angina from the outpatient department of cardiology at Xinqiao Hospital, Chongqing, China. According to a previous definition [6], patients with chronic stable angina and/or ischemia, as demonstrated via stress tests, exhibit stenosis of any diameter greater than 70% in at least one epicardial vessel. The exclusion criteria included lesions in the left main coronary artery; multivessel disease; acute coronary syndrome; and previous myocardial infarction, percutaneous coronary intervention, or coronary artery bypass grafting. Participants with serious comorbid illnesses, such as immunological diseases, cognitive impairment, renal failure requiring hemodialysis, and cancer and those who could not understand the questionnaire sufficiently were also excluded from the study.

The sample size was predetermined and the statistical power was calculated by using the PASS software, version 11 (NCSS, LLC, Kaysville, UT, USA), suggesting that 342 consecutive outpatients would provide more than 80% power for the present study.

Participants' basic characteristics: The following general characteristics were recorded and categorized: age (≤45, 46–60, or >60 years), gender (male or female), body mass index (BMI, [kg]/height [m²], normal: 18.5–23, overweight: 24–28, obese: >28), educational level (bachelor's degree or lower or master's degree or higher), monthly income (<5,000 or ≥5,000 yuan), marital status (married, unmarried, or divorced), smoker (yes or no), drinker (yes or no), exercise (never,

once per week, or twice per week or more), work/rest cycle (regular or irregular), sleep quality (good or poor), diabetes (blood glucose 126 mg/dl or 7 mmol/L or use of a specific pharmacological treatment), hypertension (systolic blood pressure of ≥140 mmHg, diastolic blood pressure of ≥90 mmHg, or treatment for hypertension), hyperlipemia (total cholesterol of ≥240 mg/dl or 6.2 mmol/l or use of lipid-lowering drugs). We defined poor sleep quality as follows: insomnia, <5 h sleep per night or use of sleeping medication. Responses regarding chronic disease (excluding the diabetes, hypertension, hyperlipemia) were yes or no.

HRQL measurement: The 36-Item Short Form health survey (SF-36; Mandarin version), which has been identified as a reliable and valid measurement tool for HRQL (Cronbach's αs = .75 to .90), was used to assess physical and mental HRQL [7]. The SF-36 includes 36 items and assesses eight dimensions of HRQL including Physical Functioning (PF), Role-Physical (RP), Bodily Pain (BP), General Health (GH), Vitality (VT), Social Functioning (SF), role limitation due to Emotional Problems (RE), and Mental Health (MH). The Physical Component Summary (PCS) is calculated as the sum of PF, RP, BP, and GH scores, and the Mental Component Summary (MCS) is calculated as the sum of VT, SF, RE, and MH scores. Higher scores, which indicate better health, are calculated and transformed into a value ranging from 0 to 100 [8].

Statistical analysis: We used SPSS 18.0 (SPSS Inc., Chicago, IL, USA) to perform two-sample t tests, one-way ANOVAs, or Kruskal-Wallis H tests as appropriate, and multivariate stepwise regression was performed to evaluate the factors influencing HRQL. In addition, we performed t tests and ANOVAs to evaluate the distribution of HRQL for the categorical variables. We also performed Pearson's correlation analysis to assess correlations between HRQL scores and continuous variables. Collinearity between two variables was considered to exist when the correlation coefficient for the relationship between the variables was >.50. No collinear variables were identified, and multivariate stepwise regression was conducted using HRQL clusters as dependent variables and basic characteristics as independent variables. Data are expressed as means ± standard deviations (SD), and the significance level was set at p < .05.

Results

Basic characteristics: Data were obtained from 342 outpatients with stable angina. The participants' basic characteristics are shown in Table 1. The age of participants ranged from 30 to 65 years. Most participants were men (N=209, 61.1%). One third of participants had a normal BMI (N=128, 37.4%), 88 participants were overweight, and 126 participants were obese. Of the 342 participants, 12.0% (N=40) had a Master or higher degree, and the rest of the participants (N=301) had a bachelor or lower degree. The monthly income of 84.8% of the participants (N=290) was lower than 5,000 Yuan; just 15.2% of participants (N=72) earned more than 5,000 Yuan every month. Regarding participant marital status, the majority (80.1%) of participants were married and 19.9% were single or divorced. A number of participants were smokers (N = 222, 58.3%) or drinkers (N = 212, 62.0%). With respect to their exercising habits, 39.2% of participants (N=238) never exercised, 27.2% of participants (N=93) exercised once per week, and 34.2% participants (N=117) exercised twice or more per week. One hundred twenty-one participants (35.4%) had a regular work/rest cycle, whereas the rest had an irregular cycle, and 108 participants (31.6%) had good sleep quality, while the rest did not. A number of participants got Diabetes (N = 40, 11.7%), or Hypertension (N = 110, 32.2%), or Hyperlipemia (N = 55, 16.1%).

Physical and mental HRQL: The results regarding physical HRQL are shown in Table 1. There were gender differences in PF, RP, and PCS

scores, and men displayed higher scores relative to those of women. PF, RP, BP, GH, and PCS scores decreased significantly with age, particularly in those aged >60 years. Outpatients with a master's degree or higher exhibited higher PF, RP, BP, GH, and PCS scores relative to those observed in participants with a bachelor's degree or lower. Regarding monthly income, participants who earned ≥5,000 yuan showed higher PF, RP, BP, and PCS scores relative to those observed for participants who earned <5,000 yuan. Married participants' RP scores were higher and GH scores were lower relative to those observed in unmarried participants. Drinkers' PF, RP, and PCS scores were lower relative to those of nondrinkers, and smokers' PF, RP, BP, and PCS scores were lower relative to those of nonsmokers. Furthermore, participants who exercised regularly showed higher PF, RP, GH, and PCS relative to those observed in participants who never exercised, but who exercised once per week higher than twice. Participants who reported poor sleep showed lower PF, RP, BP, GH, and PCS scores relative to those observed in participants who reported good sleep. Participants with diabetes exhibited lower PF, RP, BP, GH, and PCS scores relative to those observed in participants without diabetes, and participants with hypertension or hyperlipemia displayed lower BP, GH, and PCS relative to those observed in participants without these illnesses. No significant differences were observed according to BMI or work/rest cycle.

Mental HRQL results are shown in Table 2. There was a gender difference in VT scores, with men displaying higher scores relative to those of women. VT, SF, RE, and MCS scores decreased significantly with age, particularly in participants aged >60 years. Regarding educational level, participants with a master's degree or higher showed higher VT, MH, and MCS scores relative to those observed in participants with a bachelor's degree or lower. VT, SF, MH, and MCS scores observed for participants who earned ≥5,000 yuan were higher relative to those displayed by participants who earned <5,000 yuan. Smokers, VT and MH scores were lower relative to those observed in nonsmokers, and drinkers' VT scores were lower relative to those observed in nondrinkers. Furthermore, relative to those observed in participants who never exercised, participants who exercised once per week displayed higher VT and MH scores, and participants who exercised at least twice per week exhibited higher VT and RE scores. Participants who reported poor sleep showed lower VT sores relative to those observed in participants who reported good sleep. Participants with hypertension displayed lower SF scores and those with coronary heart disease exhibited lower VT scores, relative to those observed in participants without these illnesses. No significant differences were observed according to BMI, marital status, work/rest cycle, diabetes, or hyperlipemia.

Factors associated with physical and mental HRQL: The results of the stepwise multiple regression analysis of PCS showed that it was negatively associated with age, sleep quality, and drinking (Table 3). In addition, MCS was positively correlated with exercise and monthly income and negatively associated with age (Table 4).

Discussion

This cross-sectional study involving outpatients with stable angina demonstrated that physical HRQL was positively correlated with exercise and monthly income and negatively associated with age, sleep quality, and drinking, while mental HRQL was positively correlated with monthly income and exercise and negatively associated with age.

CAD is one of the most common health problems, with costly and preventable conditions reported worldwide [9]. The disease burden of CAD is usually evaluated by measuring HRQL, and the results of a longitudinal cohort study showed that approximately 26% of CAD patients experienced a significant reduction in HRQL over a 5-year

Table 1: PF, RP, BP, GH, and PCS scores based on the characteristics of patients with newly diagnosed stable angina (mean ± standard deviation).

Variable	n	PF	RP	BP	GH	PCS
Gender						
Male	209	47.1 ± 36.7	50.0 ± 33.8	62.8 ± 25.3	49.1 ± 18.7	52.3 ± 18.3
Female	133	36.7 ± 27.2*	42.3 ± 33.6*	59.0 ± 24.5	48.8 ± 16.8	46.7 ± 17.9*
Age						
≤45 years	84	59.2 ± 29.5	60.1 ± 32.6	68.2 ± 22.9	54.4 ± 20.9	60.5 ± 17.0
46–60 years	129	42.7 ± 30.2*	49.1 ± 33.7*	61.3 ± 25.5	50.4 ± 17.1	50.9 ± 18.5*
>60 years	129	32.9 ± 29.8*#	36.5 ± 31.7*#	57.0 ± 25.1*	44.0 ± 15.3*#	42.6 ± 15.4*#
BMI (kg/m²)						
Normal (<23)	128	43.5 ± 29.9	44.6 ± 33.5	60.9 ± 25.8	47.7 ± 19.3	49.2 ± 19.7
Overweight (23–25)	88	40.4 ± 30.8	48.8 ± 34.7	61.4 ± 25.6	49.2 ± 17.1	50.0 ± 17.9
Obese (>25)	126	44.4 ± 29.0	48.3 ± 33.7	61.8 ± 24.0	50.1 ± 17.1	51.2 ± 17.2
Educational level						
Bachelor's degree or lower	301	41.4 ± 28.8	44.4 ± 34.0	60.0 ± 25.1	48.1 ± 17.3	48.5 ± 17.5
Master's degree or higher	41	54.9 ± 34.2*	66.0 ± 34.6*	71.2 ± 22.6*	55.3 ± 21.4*	61.9 ± 17.1*
Monthly income						
<5,000 yuan	290	40.5 ± 29.1	43.6 ± 33.7	60.1 ± 25.5	48.5 ± 17.8	48.2 ± 18.1
≥5,000 yuan	52	57.5 ± 29.9*	66.3 ± 27.7*	68.3 ± 21.5*	51.9 ± 18.6	61.0 ± 15.5*
Marital status						
Married	274	43.1 ± 29.2	49.0 ± 33.5	61.4 ± 25.5	47.9 ± 18.1	50.4 ± 18.2
Unmarried/Divorced	68	42.9 ± 32.2	38.9 ± 33.4*	61.3 ± 23.2	53.3 ± 16.8*	49.1 ± 18.8
Smoker						
No	120	49.5 ± 28.1	55.4 ± 30.9	62.4 ± 22.2	50.6 ± 17.6	54.5 ± 16.4
Yes	222	39.6 ± 30.1*	42.5 ± 34.5*	60.8 ± 26.5	48.1 ± 18.1	47.7 ± 18.9*
Drinker						
No	130	49.8 ± 27.9	55.2 ± 32.6	62.5 ± 23.5	52.1 ± 17.6	54.9 ± 17.0
Yes	212	38.9 ± 30.2*	42.0 ± 33.7*	60.6 ± 26.0	47.1 ± 17.9*	47.2 ± 18.5*
Exercise						
Never	132	35.6 ± 29.2	34.3 ± 30.6	58.4 ± 26.4	44.9 ± 16.3	43.6 ± 16.8
Once per week	93	49.1 ± 29.2*	59.4 ± 32.6*	63.0 ± 23.1	51.8 ± 18.6*	55.8 ± 17.4*
At .least twice per week	117	45.5 ± 31.2*	51.6 ± 33.7*	63.4 ± 24.8	51.3 ± 18.4*	52.9 ± 18.5*
Work/rest cycle						
Regular	121	41.7 ± 28.0	46.0 ± 34.0	62.0 ± 25.4	49.4 ± 17.9	49.8 ± 18.1
Irregular	221	43.8 ± 30.7	47.6 ± 33.8	61.0 ± 24.9	48.8 ± 18.0	50.3 ± 18.4
Sleep quality						
Good	108	49.2 ± 30.9	54.0 ± 35.2	67.1 ± 22.9	52.4 ± 20.6	55.7 ± 18.7
Poor	234	40.2 ± 28.9*	43.8 ± 32.8*	58.7 ± 25.6*	47.4 ± 16.4*	47.5 ± 17.6*
Diabetes						
No	302	44.1 ± 30.7	48.3 ± 34.3	61.8 ± 24.8	49.5 ± 17.9	50.9 ± 18.4
Yes	40	35.5 ± 20.7*	37.5 ± 29.0*	58.1 ± 26.9	44.8 ± 17.6	44.0 ± 16.3*
Hypertension						
No	232	44.2 ± 30.9	47.0 ± 34.7	64.5 ± 24.3	51.0 ± 18.9	51.7 ± 18.6
Yes	110	40.6 ± 27.3	47.2 ± 32.1	54.6 ± 25.4*	44.8 ± 14.9*	46.8 ± 17.4*
Hyperlipemia						
No	287	42.8 ± 30.3	48.1 ± 34.5	62.5 ± 24.9	50.1 ± 18.3	50.9 ± 18.7
Yes	55	44.6 ± 27.1	41.5 ± 29.8	55.2 ± 25.3*	42.9 ± 14.3*	46.1 ± 15.6*

*P < .05 vs the first row in the same category, #P < .05 vs the second row in the same category, BMI: body mass index, BP: bodily pain, GH: general health, PCS: physical component summary, PF: physical functioning, RP: role-physical, SD: standard deviation

period [10]. Moreover, the framework developed by the International Classification of Functioning, Disability and Health demonstrated that reductions in HRQL in CAD patients involve not only physical symptoms with activity limitations but also social support, participation, and personal perception [11].

Angina is the initial clinical manifestation in 25% to 50% of all CAD patients [12] and has been associated with poor HRQL and depressive symptoms, and individuals with angina exhibit higher scores for pain or worry relative to those observed in individuals without angina

[13,14]. However, to our knowledge, the disease burden and risk factors for newly diagnosed stable angina, as evaluated via HRQL, have not been examined comprehensively. The current results showed that physical and mental HRQL were positively associated with exercise and monthly income and negatively associated with age. The findings are consistent with those of a previous study indicating that poor HRQL was associated with greater fatigue and decreased exercise capacity, independent of mental distress and CAD severity in CAD patients undergoing rehabilitation [15]. Another study revealed that both age

Table 2: VT, SF, RE, MH, and MCS scores according to the characteristics of patients with newly diagnosed stable angina (mean ± SD).

Variables	n	VT	SF	RE	MH	MCS
Gender						
Male	209	48.3 ± 19.9	66.5 ± 18.8	71.5 ± 27.1	59.9 ± 17.6	61.6 ± 13.7
Female	133	43.5 ±20.1*	64.7 ± 21.7	67.7 ± 31.3	59.9 ± 18.7	58.9 ± 14.1
Age						
≤45 years	84	51.9 ± 20.5	69.5 ± 17.4	75.5 ± 25.7	58.8 ± 18.4	63.9 ± 13.4
46–60 years	129	47.9 ± 20.5	67.0 ± 20.5	70.9 ± 29.3	61.1 ± 18.1	61.7 ± 14.1
>60 years	129	41.4 ± 18.3*#	62.2 ± 20.5*	65.6 ± 29.7*	59.3 ± 17.7	57.1 ± 13.3*#
BMI (kg/m^2)						
Normal (<23)	128	46.0 ± 20.7	63.6 ± 20.7	67.5 ± 32.1	57.4 ± 18.7	58.6 ± 15.4
Overweight (23–25)	88	44.7 ± 21.2	68.4 ± 19.0	69.5 ± 28.2	62.2 ± 17.8	61.2 ± 12.8
Obese (>25)	126	48.1 ± 18.6	66.1 ± 19.8	72.9 ± 25.5	60.8 ± 17.2	62.0 ± 12.8
Educational level						
Bachelor or lower	301	45.6 ± 19.8	65.1 ± 20.2	69.5 ± 28.9	59.2 ± 18.2	59.9 ± 13.8
Master or higher	41	52.8 ± 21.4*	70.7 ± 17.9	73.4 ± 28.2	64.7 ± 16.3*	65.4 ± 13.2*
Monthly income						
<5,000 yuan	290	44.8 ± 20.1	64.8 ± 20.5	69.3 ± 29.5	59.1 ± 18.6	59.5 ± 13.9
≥5,000 yuan	52	55.6 ± 17.4*	71.4 ± 15.5*	73.7 ± 24.5	64.4 ± 13.7*	66.3 ± 12.1*
Marital status						
Married	274	46.8 ± 19.2	66.1 ± 19.6	70.2 ± 28.3	59.4 ± 17.7	60.6 ± 13.9
Unmarried/Divorced	68	45.2 ± 23.3	64.7 ± 21.6	69.1 ± 31.2	61.7 ± 19.1	60.2 ± 13.8
Smoker						
No	120	51.4 ± 16.8	63.9 ± 17.2	71.4 ± 25.0	57.0 ± 16.9	60.9 ± 12.4
Yes	222	43.8 ± 21.2*	66.8 ± 21.3	69.3 ± 30.7	61.5 ± 18.4*	60.3 ± 14.5
Drinker						
No	130	51.7 ± 18.1	64.5 ± 17.9	73.3 ± 25.2	57.8 ± 16.7	61.8 ± 12.8
Yes	212	43.3 ± 20.6*	66.6 ± 21.2	68.0 ± 30.7	61.2 ± 18.7	59.7 ± 14.4
Exercise						
Never	132	41.4 ± 21.5	66.7 ± 23.2	64.5 ± 32.0	61.4 ± 18.9	58.5 ± 15.5
Once per week	93	51.2 ± 16.6*	66.7 ± 16.5	72.2 ± 27.2	55.3 ± 15.2*	61.2 ± 12.3
At least twice per week	117	48.4 ± 19.8*	64.6 ± 18.6	74.4 ± 25.3*	61.8 ± 18.5	62.3 ± 12.9
Work/rest cycle						
Regular	121	46.0 ± 20.4	66.0 ± 19.3	69.8 ± 29.8	60.9 ± 17.7	60.7 ± 13.6
Irregular	221	46.7 ± 19.9	65.7 ± 20.4	70.1 ± 28.3	59.3 ± 18.2	60.5 ± 14.0
Sleep quality						
Good	108	50.8 ± 18.7	68.0 ± 17.7	70.5 ± 29.0	59.5 ± 15.8	62.2 ± 13.3
Poor	234	44.4 ± 20.4*	64.8 ± 20.9	69.8 ± 28.8	60.0 ± 19.0	59.7 ± 14.1
Diabetes						
No	302	46.9 ± 20.1	66.5 ± 19.4	70.8 ± 28.5	59.9 ± 17.7	61.0 ± 13.5
Yes	40	43.3 ± 19.6	60.6 ± 23.5	64.2 ± 30.6	59.9 ± 20.5	57.0 ± 15.9
Hypertension						
No	232	46.6 ± 20.5	68.2 ± 19.3	69.7 ± 29.4	60.5 ± 17.7	61.2 ± 13.7
Yes	110	46.1 ± 19.2	60.7 ± 20.6*	70.7 ± 27.6	58.5 ± 18.7	59.0 ± 14.2
Hyperlipemia						
No	287	46.9 ± 20.7	66.0 ± 20.5	69.2 ± 29.2	59.7 ± 18.2	60.4 ± 14.2
Yes	55	44.3 ± 16.8	64.9 ± 17.0	74.2 ± 26.3	61.0 ± 17.2	61.1 ± 12.1

*P < .05 vs the first row in the same category, #P < .05 vs the second row in the same category, BMI: body mass index, MCS: mental component summary, MH: mental health, RE: role emotional, SD: standard deviation, SF: social functioning, VT: vitality

and household income were associated with HRQL; however, gender, perceived social support, history of angina, and dyslipidemia were identified as risk factors [16]. This partial inconsistency could be attributed to differences between participants. Previous studies reported that comorbid conditions (i.e., heart failure and peripheral artery disease), the frequency with which patients visited family physicians, and educational level were significant predictors of HRQL in CAD patients [3]. Factors such as heart failure, peripheral artery disease, and the frequency with which participants visited family physicians

were not included in the current study; however, comorbid conditions (i.e., diabetes, hypertension, and hyperlipemia) and educational level were not identified as risk factors for poor HRQL in patients with stable angina. Furthermore, sleep quality and drinking were negatively associated with physical, but not mental, HRQL, which is consistent with previous results [17].

Reduced HRQL has been associated with poor prognosis in CAD patients [18]. Moreover, HRQL plays a predictive role in clinical events in this populations and is not affected by health-related behavior,

Table 3: Stepwise regression predicting PCS scores.

Variables	Physical Component Summary (PCS)				
	Step1 (β)	Step2 (β)	Step3 (β)	Step4 (β)	Step5 (β)
Age	-0.524**	-0.518**	-0.479**	-0.456**	-0.430**
Exercise		4.569**	4.342**	4.045**	4.133**
Monthly income			7.379**	7.844**	7.417**
Sleep quality				-5.701**	-5.725**
Drinking					-4.678**

*P < .05, **P < .01

Table 4: Stepwise regression predicting the MCS scores.

Variables	Mental Component Summary (MCS)		
	Step1 (β)	Step2 (β)	Step3 (β)
Age	-0.224**	-0.199**	-0.198**
Monthly income		4.840*	4.534*
Exercise			3.556*

*P < .05, **P < .01

socioeconomic factors, or health condition [19]. Therefore, exploration of risk factors affecting HRQL scores in patients with newly diagnosed stable angina is of great importance. Although we cannot delay aging, we can improve the quality of physical life by exercising properly, improving sleep quality, actively treating cardiovascular diseases, and petitioning the government to increase average income. In addition, to improve the quality of mental life, patients should rest quietly to recuperate, and we should petition the government to increase average income.

Limitations

The study was subject to some limitations. For example, the cross-sectional study design did not allow inference of causal relationships between variables. Further, the use of self-reported assessments could have led to bias in the data analysis, although the reliability and validity of the SF-36 have been evaluated extensively. Moreover, because the study sample included only one type of participant, caution should be exercised in generalizing the results to the general population.

Conclusion

This study showed that physical health status was associated with age, sleep quality, exercise habits, and monthly income, while mental health status was associated with age, exercise, and monthly income in outpatients with newly diagnosed stable angina. Higher monthly income was associated with higher physical and mental HRQL scores, while regular exercise was related to higher PCS scores. These findings are important in planning strategies to improve physical and mental health in cardiovascular medicine outpatients. Future research should involve a large survey with random samples of outpatients with newly diagnosed stable angina worldwide.

Summary Statement

What is already known about this topic?

- Stable angina is one of the most common clinical type of Coronary artery disease (CAD), and is associated with poor health-related quality of life (HRQL).

- Few studies evaluate the risk factors associated with HRQL in patients with newly diagnosed stable angina.

What this paper adds?

- Patients who were older, were females, did not exercise, and had lower educational levels, lower monthly incomes, smoking/drinking habits, diabetes, hypertension, and hyperlipemia showed low physical HRQL scores.

- Patients who were older with lower educational levels and monthly incomes showed low mental HRQL scores.

- The results of multiple stepwise regression showed that physical and mental HRQL were positively correlated with exercise and monthly income and negatively associated with age. Sleep quality and drinking were negatively associated with physical, but not mental, HRQL.

The implications of this paper:

- These findings are important in planning strategies to improve physical and mental health in cardiovascular medicine outpatients.

Ethics statement

The study protocol was approved by the ethics committee on human experimentation at the Second Affiliated Hospital of the Army Military Medical University, Chongqing, China (NO: 2018-YD078-01) and conformed to the standards established by the Declaration of Helsinki. All participants read and signed the consent form.

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