Observational Study

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Association between subjective health status and responses to traditional Korean medicine assessments in healthy adults

A cross-sectional study

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Abstract

Subjective health status comprises an individual's self-assessment of health and indicates their actual health outcomes. This study aimed to explore the relationship between traditional Korean Medicine (KM) inquiry outcomes and subjective health status to provide a better understanding of the potential benefits of KM practices, which have been overlooked in existing research. This observational study recruited 5987 healthy adults (age ≥ 19 years) between April 11, 2022, and December 19, 2023. Participants were surveyed using standardized KM inquiries and subjective health status assessments. Statistical analyses included chi-square tests and multivariate logistic regression analyses to examine the relationship between KM inquiry outcomes and subjective health status. An analysis of 4935 respondents who completed KM inquiries revealed that factors affecting subjective health status for both men and women included appetite, digestive discomfort, residual urine sensation, waking condition, cold intolerance, and exercise habits. Factors affecting subjective health status differed slightly by sex; for men, dry mouth and alcohol consumption were significant, whereas, for women, dry mouth, meal frequency, sleep quality, and feelings after sweating were significant. This study confirms the utility of KM inquiries in assessing the subjective health status of healthy adults and provides insights into the development of sex-specific lifestyle health-management strategies.

Abbreviations: IPAQ-SF = International Physical Activity Questionnaire Short Form, KM = traditional Korean medicine, PSQI = Pittsburgh Sleep Quality Index.

Keywords: observation study, self-perceived health, subjective health status, traditional Korean Medicine

1. Introduction

Subjective health is an individual's evaluation of their health status. It involves a holistic assessment wherein the individual, the primary stakeholder of their health, evaluates health-related aspects such as pain, discomfort, and fatigue.[1,2] As extensively proven, subjective health is a valid surrogate for actual health and significantly prognosticates mortality rates, even after adjusting for health-related variables.[3–5] Additionally, subjective health is an indicator not only for societal aspects, such as quality of life, spiritual status, and interpersonal relationships but also is a summary measure for patient health monitoring in the clinical setting.[6,7]

In traditional Korean Medicine (KM), health is conceptualized as the harmonization of *yin* and *yang*, encompassing the body's internal state and external influences and principles of essence, *qi*, spirit, harmony and balance, and individuality. Unlike the static entities of health and disease in Western medicine, KM considers the state of the body as a dynamic continuum,[8,9] and KM inquiry is a diagnostic method wherein information is gathered directly from patients regarding their complaints, disease history, and current symptoms.[10] The method of KM inquiry is crucial because it relies on patients' responses, and patients are often the most knowledgeable about their condition. KM inquiry probes not only the primary symptoms but also various ancillary symptoms. A comprehensive understanding of the patient's overall condition, including dietary habits, sleep patterns, and bowel movements, can enhance diagnostic accuracy.[11] KM inquiry utilizes a range of measures associated

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The authors declare that they have no conflicts of interest.

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

This study was approved by the institutional review board of 5 hospitals in accordance with the Declaration of Helsinki: Gachon University Gil Medical Center (GIRB-22-101; GIRB-23-103), Dongguk University Ilsan Oriental Hospital (DUIOH-2022-01-005; DUIOH-2023-03-001), Naju Dongshin University Korean Medicine Hospital (NJ-IRB-013; NJ-IRB-23-3), Pusan National University Korean Medicine Hospital (PNUKHIRB-2022-02-001; PNUKHIRB-2023-02-002), and Semyung University Korean Medicine Hospital (SMJOH-2022-06; SMJOH-2023-04). Informed consent was obtained from all the eligible participants.

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with self-reported health status to ascertain aspects of physical and emotional well-being. Therefore, identifying the factors that influence subjective health status within a KM inquiry has significant clinical relevance. However, the relationship between subjective health and KM inquiries has been sparsely researched.

This study aimed to explore the association between KM inquiry and subjective health status among healthy adults.

2. Methods

2.1. Study population

In this observational study, we analyzed the data on the KM examination results of participants recruited between April 11, 2022, and December 19, 2023. KM inquiry involves standardizing and quantifying the measurement protocol based on KM's core indicators commonly used to evaluate the patient's health status in KM clinical practice.[12] Participants were voluntarily recruited on a first-come, first-served basis and screened for eligibility.

2.1.1. Selection criteria. All the participants were healthy men and women (aged ≥ 19 years) without cognitive impairment.

2.1.2. Exclusion criteria. The exclusion criteria were as follows: inability to move independently or use measurement devices (e.g., an InBody device); current diagnosis of cardiovascular diseases (e.g., myocardial infarction, congestive heart failure, angina, and arrhythmia); cerebrovascular diseases (e.g., cerebral infarction and paralysis); malignant neoplasms (e.g., cancer); mental illnesses (e.g., depression and anxiety disorder); rheumatoid arthritis; and thyroid diseases (e.g., hyperthyroidism and hypothyroidism). Lifestyle-related diseases included the diagnosis of hypertension, diabetes mellitus, and hyperlipidemia.

2.2. Study design

2.2.1. Subjective health status. Subjective health status was evaluated based on the participants' responses (very good, good, average, bad, or very bad) to the question: "In general, how would you rate your current health status?" For the analysis, very good and good responses were categorized as "good," whereas average, bad, and very bad responses were categorized as "fair/bad."

2.2.2. Health behaviors. Participants' sex and age were recorded, and their height and weight were measured to calculate their body mass index (BMI; kg/m^2). Furthermore, the prevalence of hypertension, diabetes mellitus, and dyslipidemia was assessed.

2.2.3. KM inquiry. Participants completed the KM inquiry, which included items on thirst, dry mouth, number of meals per day, meal duration, appetite, digestive discomfort, number of bowel movements per day, straining during defecation, tenesmus, frequency of micturition per day, a sensation of residual urine, nocturia, dysuria, time from alarm to actual waking, condition upon waking, number of awakenings during sleep per day, insomnia caused by dreams per week, sleep quality, amount of sweating, feeling after sweating, night sweats, cold intolerance, heat intolerance, cold sensation, heat sensation, smoking status, alcohol consumption, and exercise habits. The Pittsburgh Sleep Quality Index (PSQI) was used to measure sleep quality.[13,14] Exercise habits were evaluated using the International Physical Activity Questionnaire Short Form (IPAQ-SF).[15,16]

2.4. Statistical analysis

Data were analyzed using SPSS Version 20 (SPSS Inc., Chicago, Illinois, USA). All statistical tests were 2-sided, and the significance level was set at $P < .05$. The frequency and percentage of participants stratified by general characteristics and KM inquiry were presented, and the sex differences for each variable were ascertained using the chi-square test. The Fisher exact test was used for small sample sizes or low expected cell frequency.

To identify the factors influencing subjective health status, the statistically significant variables in the univariate analysis were used as independent variables in the multivariate logistic regression analysis, with subjective health status as the dependent variable. The reference group for this analysis comprised participants who perceived themselves to be in good health. The results were presented as adjusted odds ratios (ORs) with 95% CIs.

3. Results

From an initial pool of 6000 individuals, 13 were excluded based on the selection criteria, and the remaining 5987 were enrolled as participants. During the study period, 10 participants withdrew their consent, and 1042 participants were excluded because of incomplete responses or erroneous data in their KME questionnaire. The analysis included data from the remaining 4935 participants. Figure 1 shows the flowchart of the enrollment process.

3.1. Participant characteristics

Among the 4935 participants (men: 1305 [26.4%]; women: 3630 [73.6%]), men were predominantly in their 40s (n = 313 [24.0%]), whereas women were mostly in their 50s (n = 1041 [28.7%]). Regarding the BMI, the majority of men were classified as obese (BMI > 25.0 kg/m^2; n = 610 [46.7%]), whereas the majority of women were within the normal range (BMI: 18.5 to 22.9; n = 1746 [48.1%]). In terms of subjective health status, 633 (48.5%) men and 1269 (35.0%) women reported good health (Table 1).

3.2. Health behavior-stratified characteristics of subjective health status

In both sexes, subjective health status was significantly associated with age, BMI, hypertension, diabetes mellitus, and dyslipidemia (Table 2). A higher proportion of participants who were diagnosed with hypertension, diabetes mellitus, or dyslipidemia reported fair/bad health than good health, irrespective of sex.

3.3. KM inquiry-stratified characteristics of subjective health status

Differences in subjective health status according to the KM inquiry of the participants are shown in Table 3.

In both sexes, the absence of thirst and dry mouth were significantly associated with a higher proportion of good health. Variables related to the number of daily meals were significant only in women. In both sexes, a meal duration >10 minutes was associated with a significantly higher proportion of good health. Participants with appetite and without digestive discomfort were significantly more likely to report good health, irrespective of sex.

Although the number of bowel movements per day was not significant, participants who experienced straining during defecation or tenesmus were significantly more likely to report fair/bad health, regardless of sex. The frequency of micturition per day was not significant; however, participants who reported a sensation of residual urine or dysuria were significantly more likely to report fair/bad health. Nocturia, defined as 2 or more episodes of micturition at night, was associated with a significantly higher proportion of fair/bad health in both sexes.

Participants who took more than 20 minutes from alarm to actual waking, reported poor conditions upon waking, experienced more than 2 awakenings during sleep per day and suffered from dream-associated insomnia 3 to 7 days per week all reported a significantly higher proportion of fair/bad health. In both sexes, a PSQI score >5, which is indicative of poor sleep quality, was associated with a significantly higher proportion of fair/bad health.

Perspiration was significant only in women, with both sexes being significantly more likely to report fair/bad health if they experienced postsweating discomfort. Among women, the absence of night sweats was significantly associated with a perception of good health.

Cold intolerance was significant for both sexes, whereas heat intolerance was not significant among women. Conversely, the absence of cold or heat sensations was significantly associated with both sexes' perceptions of good health.

Although smoking was not significantly associated, a significantly higher proportion of men who consumed alcohol reported good health status.

Men and women with high exercise levels had a significantly higher proportion of good health.

3.4. Factors associated with the subjective health status and KM inquiry

Using a multivariate logistic regression model, we examined KM factors associated with subjective health status.

3.4.1. Men. The KM factors that significantly affected subjective health status included thirst, appetite, digestive discomfort, sensation of residual urine, condition when waking up, cold sensation, alcohol consumption, and exercise, as measured by the IPAQ-SF (Table 4).

The ORs (95% confidence interval [CI]) indicated that participants with symptoms of thirst and digestive discomfort were 0.67 (0.49 to 0.93) and 0.59 (0.46 to 0.75) times less likely to be classified in the group with a higher perception of subjective health, whereas those with appetite had a 2.27-fold (1.78 to 2.90) increased likelihood of being classified therein.

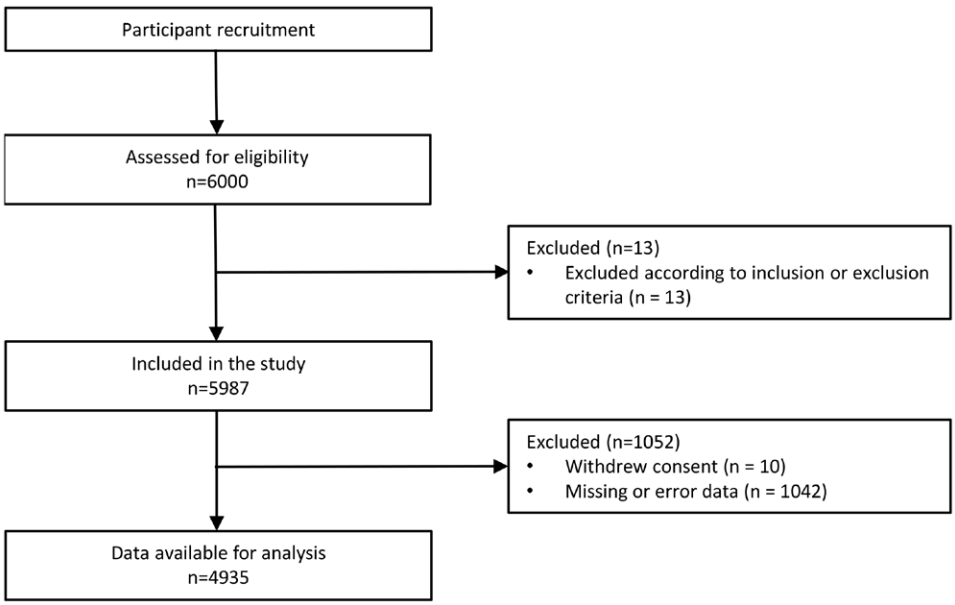

Figure 1. Flowchart of participant selection.

Table 1

Characteristics of the participants.

Characteristics	Total	Men	Women	*P* value
n (%)	4935 (100.0%)	1305(26.4%)	3630 (73.6%)	
Age (yr)				
20 to 29	640 (13.0%)	248 (19.0%)	392 (10.8%)	<.001
30 to 39	769 (15.6%)	244 (18.7%)	525 (14.5%)	
40 to 49	1316 (26.7%)	313 (24.0%)	1003 (27.6%)	
50 to 59	1273 (25.8%)	232 (17.8%)	1041 (28.7%)	
60+	937 (19.0%)	268 (20.5%)	669 (18.4%)	
BMI (kg/m^2)				
<18.5	169 (34.0%)	7 (0.5%)	162 (4.5%)	<.001
18.5 to 22.9	2071 (42.0%)	325 (24.9%)	1746 (48.1%)	
23.0 to 24.9	1122 (22.7%)	363 (27.8%)	759 (20.9%)	
>25.0	1573 (31.9%)	610 (46.7%)	963 (26.5%)	
Subjective health status				
Good health	1902 (38.5%)	633 (48.5%)	1269 (35.0%)	<.001
Fair/bad health	3033 (61.5%)	672 (51.5%)	2361 (65.0%)	

P values were obtained from chi-squared tests. The categorical variables are reported as frequency and proportion. BMI = body mass index.

Participants with a sensation of residual urine were 0.71 (0.56 to 0.91) times less likely to be classified in the group with a higher perception of subjective health, whereas those reporting a good condition on waking were 2.26 (1.51 to 3.39) times more likely to be classified in this group as compared to those reporting a bad condition. The presence of a cold sensation was associated with a 0.64-fold (0.48 to 0.84) decreased likelihood of being classified into the group with a higher perception of subjective health. Compared to nondrinkers, current alcohol consumers were found to be 1.49 (1.13 to 1.98) times more likely to be classified in the group with a higher perception of subjective health. Participants who engaged in regular moderate and high-intensity exercise were 1.83 (1.32 to 2.55) and 1.51 (1.16 to 1.96) times more likely to be classified in the group with a higher perception of subjective health compared to those who engaged in low-intensity exercise.

3.4.2. Women. The KM inquiry factors that significantly influenced subjective health status included dry mouth, number of meals per day, meal duration, appetite, digestive discomfort, sensation of residual urine, condition on waking, sleep quality as measured by the PSQI, and feeling after sweating, cold sensation, and exercise, as measured by the IPAQ-SF (Table 5).

Those experiencing symptoms of dry mouth were 0.75 (0.49 to 0.67) times less likely to be classified in the group with a higher perception of subjective health. Consuming 3 to 5 meals per day, compared to 1 to 2 meals, was associated with a 0.75-fold (0.64 to 0.87) lower likelihood of inclusion in the group with a higher perception of subjective health. A meal duration of >10 minutes increased this likelihood by 1.27 (1.08 to 1.50) times. Appetite increased the likelihood of inclusion in the group with a higher perception of subjective health 1.58 (1.37 to 1.83) times, whereas the presence of digestive discomfort decreased it by 0.57 (0.49 to 0.67) times. Sensation of residual urine was associated with a 0.84-fold (0.72 to 0.98) decreased likelihood of inclusion in the group with a higher perception of subjective health. Reporting a good condition upon waking up increased the likelihood of inclusion in the group with a higher perception of subjective health 1.93 (1.52 to 2.46) times, whereas a PSQI score >5, indicating worse sleep quality, decreased the likelihood 0.66 (0.56 of the 0.78) times. Compared to a bad feeling, a fair or good feeling after sweating increased the likelihood of being classified in the group with a higher perception of subjective health by 1.67 (1.32 to 2.11) and 1.43 (1.19 to 1.73) times, respectively. The presence of a cold sensation decreased the likelihood of being included in the group with a higher perception of subjective health 0.81 (0.70 to 0.94) times. Regular exercise at medium and high intensity increased the likelihood of being classified in the group with a higher perception of subjective health 1.86 (1.52 to 2.29) and 1.48 (1.24 to 1.75) times, respectively, compared to those who undertook low-intensity exercise.

4. Discussion

This study investigated the relationship between KM inquiries and the subjective health status of healthy adults.

Our findings indicate that in both sexes, subjective health status is significantly associated with hypertension, diabetes mellitus, and dyslipidemia. After adjusting for related factors, subjective health status was independently associated with hypertension in both men and women among Korean adults.[17] A study conducted in the United States between 1996 and 2005 found that adults with diabetes mellitus who rated their subjective health as fair/bad were more likely to experience adverse health outcomes.[18] An association between subjective health status and cardiovascular disease risk factors such as hypertension, dyslipidemia, diabetes mellitus, and obesity has been identified.[19] Improper lifestyle habits can lead to health abnormalities and gradually lead to the onset of lifestyle-based diseases, such as hypertension, dyslipidemia, and diabetes mellitus. These conditions were significantly associated with subjective health status.

In particular, for diseases characterized predominantly by subjective symptoms with minimal objective physical signs or those arising from emotional factors, the primary complaints reported by the patient during the inquiry can guide the physician in identifying disease-specific aspects that require focused attention. The outcomes of KM inquiry, which can influence subjective health status, exhibited distinct sex differences. Multivariate logistic regression analysis identified several factors that significantly influenced the subjective health status of both men and women, including appetite, digestive discomfort, residual urine sensation, waking condition, cold sensation, and exercise. Inflammation is one of the leading causes of decreased

Table 2

Differences in subjective health status according to the health behaviors of the participants.

	Men (N = 1305)			Women (N = 3630)		
Characteristics	**Good health**	**Fair/bad health**	***P*-value**	**Good health**	**Fair/bad health**	***P* value**
Age (years)						
20 to 29	136 (21.5%)	112 (16.7%)	.049	181 (14.3%)	211 (8.9%)	<.001
30 to 39	135 (21.3%)	109 (16.2%)		177 (13.9%)	348 (14.7%)	
40 to 49	131 (20.7%)	182 (27.1%)		316 (24.9%)	687 (29.1%)	
50 to 59	108 (17.1%)	124 (18.5%)		335 (26.4%)	706 (29.9%)	
60+	123 (19.4%)	145 (21.6%)		260 (20.5%)	409 (17.3%)	
BMI (kg/m^2)						
<18.5	3 (0.5%)	4 (0.6%)	.017	66 (5.2%)	96 (4.1%)	<.001
18.5 to 22.9	165 (26.1%)	160 (23.8%)		663 (52.2%)	1083 (45.9%)	
23.0 to 24.9	187 (29.5%)	176 (26.2%)		270 (21.3%)	489 (20.7%)	
≥25.0	278 (43.9%)	332 (49.4%)		270 (21.3%)	693 (29.4%)	
Hypertension						
No	575 (90.8%)	557 (82.9%)	<.001	1194 (94.1%)	2142 (90.7%)	<.001
Yes	58 (9.2%)	115 (17.1%)		75 (5.9%)	219 (9.3%)	
Diabetes mellitus						
No	607 (95.9%)	618 (92.0%)	<.001	607 (95.9%)	2275 (96.4%)	<.001
Yes	26 (4.1%)	54 (8.0%)		26 (4.1%)	86 (3.6%)	
Dyslipidemia						
No	586 (92.6%)	586 (87.2%)	<.001	1183 (93.2%)	2110 (89.4%)	<.001
Yes	47 (7.4%)	86 (12.8%)		86 (6.8%)	251 (10.6%)	

Values are presented as numbers (%). *P* value is derived using the chi-squared test or the Fisher exact test. BMI = body mass index.

Table 3

Differences in subjective health status stratified by the KM inquiry of the participants.

	Men (N = 1305)			Women (N = 3630)		
Characteristics	**Good health**	**Fair/bad health**	***P* value**	**Good health**	**Fair/bad health**	***P* value**
Thirsty						
No	145 (22.9%)	87 (12.9%)	<.001	247 (19.5%)	274 (11.6%)	<.001
Yes	488 (77.1%)	585 (87.1%)		1022 (80.5%)	2087 (88.4%)	
Dry mouth						
No	213 (33.6%)	154 (22.9%)	<.001	417 (32.9%)	498 (21.1%)	<.001
Yes	420 (66.4%)	518 (77.1%)		852 (67.1%)	1863 (78.9%)	
Number of meals per day						
1 to 2	203 (32.1%)	220 (32.7%)	.796	484 (38.1%)	804 (34.1%)	.014
3 to 5	430 (67.9%)	452 (67.3%)		785 (61.9%)	1557 (65.9%)	
Meal duration						
≤10 min	185 (29.2%)	231 (34.4%)	.046	318 (25.1%)	705 (29.9%)	.002
>10 min	448 (70.8%)	441 (65.6%)		951 (74.9%)	1656 (70.1%)	
Appetite						
No	179 (28.3%)	350 (52.1%)	<.001	510 (40.2%)	1216 (51.5%)	<.001
Yes	454 (71.7%)	322 (47.9%)		759 (59.8%)	1145 (48.5%)	
Digestive discomfort						
No	351 (55.5%)	245 (36.5%)	<.001	588 (46.3%)	629 (26.6%)	.001
Yes	282 (44.5%)	427 (63.5%)		681 (53.7%)	1732 (73.4%)	
Number of stools per day						
<0.5	69 (10.9%)	59 (8.8%)	.312	356 (28.1%)	665 (28.2%)	.320
0.5 to 2.0	514 (81.2%)	550 (81.8%)		886 (69.8%)	1626 (68.9%)	
>2.0	50 (7.9%)	63 (9.4%)		27 (2.1%)	70 (3.0%)	
Straining during defecation						
No	135 (21.3%)	98 (14.6%)	.001	257 (20.3%)	349 (14.8%0	<.001
Yes	498 (78.7%)	574 (85.4%)		1012 (79.7%)	2012 (85.2%)	
Tenesmus						
No	183 (28.9%)	143 (21.3%)	.001	389 (30.7%)	516 (21.9%)	<.001
Yes	450 (71.1%)	529 (78.7%)		880 (69.3%)	1845 (78.1%)	
Number of urines per day						
<8	489 (77.3%)	513 (76.3%)	.697	947 (74.6%)	1748 (74.0%)	.699
≥8	144 (22.7%)	159 (23.7%)		322 (25.4%)	613 (26.0%)	
Residual urine sensation						
No	325 (51.3%)	250 (37.2%)	<.001	781 (61.5%)	1176 (49.8%)	<.001
Yes	308 (48.7%)	422 (62.8%)		488 (38.5%)	1185 (50.2%)	
Nocturia						
0 to 1 d	368 (58.1%)	349 (51.9%)	.024	647 (51.0%)	1090 (46.2%)	.006
2 to 7 d	265 (41.9%)	323 (48.1%)		622 (49.0%)	1271 (53.8%)	
Pain during urination						
No	564 (89.1%)	551 (82.0%)	<.001	1179 (92.9%)	2108 (89.3%)	<.001
Yes	69 (10.9%)	121 (18.0%)		90 (7.1%)	253 (10.7%)	
Time from alarm to actual wake-up						
<20 min	542 (85.6%)	546 (81.2%)	.034	1057 (83.3%)	1832 (77.6%)	<.001
≥20 min	91 (14.4%)	126 (18.8%)		212 (16.7%)	529 (22.4%)	
Condition when waking up						
Bad	518 (81.8%)	629 (93.6%)	<.001	1041 (82.0%)	2210 (93.6%)	<.001
Good	115 (18.2%)	43 (6.4%)		228 (18.0%)	151 (6.4%)	
Number of awakenings during sleep per day						
≤1	474 (74.9%)	456 (67.9%)	.005	856 (67.5%)	1368 (57.9%)	<.001
≥2	159 (25.1%)	216 (32.1%)		413 (32.5%)	993 (42.1%)	
Number of insomnia episodes caused by dreams per week						
0	436 (68.9%)	411 (61.2%)	.013	793 (62.5%)	1217 (51.5%)	<.001
1 to 2	135 (21.3%)	183 (27.2%)		342 (27.0%)	756 (32.0%)	
3 to 7	62 (9.8%)	78 (11.6%)		134 (10.6%)	388 (16.4%)	
Sleep quality (PSQI)						
0 to 4	234 (37.0%)	170 (25.3%)	<.001	502 (39.6%)	561 (23.8%)	<.001
5 to 21	399 (63.0%)	502 (74.7%)		767 (60.4%)	1800 (76.2%)	
Amount of sweating						
Many	122 (19.3%)	133 (19.8%)	.095	456 (35.9%)	868 (36.8%)	.010
Normal	289 (45.7%)	269 (40.0%)		569 (44.8%)	953 (40.4%)	
Few	222 (35.1%)	270 (40.2%)		244 (19.2%)	540 (22.9%)	
Feeling after sweating						
Bad	106 (16.7%)	143 (21.3%)	<.001	204 (16.1%)	545 (23.1%)	<.001
Fair	339 (53.6%)	403 (60.0%)		726 (57.2%)	1453 (61.5%)	
Good	188 (29.7%)	126 (18.8%)		339 (26.7%)	363 (15.4%)	
Night sweating						
No	583 (92.1%)	598 (89.0%)	.055	1180 (93.0%)	2102 (89.0%)	<.001
Yes	50 (7.9%)	74 (11.0%)		89 (7.0%)	259 (11.0%)	

(*Continued*)

Table 3

(*Continued*)

Characteristics	Men (N = 1305)			Women (N = 3630)		
	Good health	Fair/bad health	*P* value	Good health	Fair/bad health	*P* value
Cold intolerance						
No	39 (6.2%)	23 (3.4%)	.020	42 (3.3%)	52 (2.2%)	.045
Yes	594 (93.8%)	649 (96.6%)		1227 (96.7%)	2309 (97.8%)	
Heat intolerance						
No	15 (2.4%)	6 (0.9%)	.034	26 (2.0%)	36 (1.5%)	.245
Yes	618 (97.6%)	666 (99.1%)		1243 (98.0%)	2325 (98.5%)	
Cold sensation						
No	512 (80.9%)	461 (68.6%)	<.001	734 (57.8%)	1059 (44.9%)	<.001
Yes	121 (19.1%)	211 (31.4%)		535 (42.2%)	1302 (55.1%)	
Heat sensation						
No	495 (78.2%)	489 (72.8%)	.023	828 (65.2%)	1289 (54.6%)	<.001
Yes	138 (21.8%)	183 (27.2%)		441 (34.8%)	1072 (45.4%)	
Smoking						
No	493 (77.9%)	506 (75.3%)	.271	1240 (97.7%)	2305 (97.6%)	.869
Yes	140 (22.1%)	166 (24.7%)		29 (2.3%)	56 (2.4%)	
Alcohol						
No	137 (21.6%)	186 (27.7%)	.012	520 (41.0%)	1011 (42.8%)	.283
Yes	496 (78.4%)	486 (72.3%)		749 (59.0%)	1350 (57.2%)	
Exercise (IPAQ-SF)						
Low	98 (15.5%)	155 (23.1%)	<.001	255 (20.1%)	667 (28.3%)	<.001
Medium	237 (37.4%)	286 (42.6%)		592 (46.7%)	1166 (49.4%)	
High	298 (47.1%)	231 (34.4%)		422 (33.3%)	528 (22.4%)	

Values are presented as numbers (%). *P* value derived by the chi-square test. IPAQ-SF = International Physical Activity Questionnaire Short Form, PSQI = Pittsburgh Sleep Quality Index.

appetite, as it can reduce gastrointestinal motility, alter gastric secretions, and induce taste aversions.[20] Functional dyspepsia and irritable bowel syndrome are associated with digestive discomfort, both commonly presenting with upper abdominal discomfort or pain.[21,22] Patients with lower urinary tract symptoms who report a sensation of incomplete bladder emptying have a reduced quality of life.[23] Individuals who wake-up tired may have poor sleep quality, side effects of medication, heart issues, aging, and depression.[24] Cold hypersensitivity of the hands and feet is associated with diabetes mellitus, dyslipidemia, degenerative arthritis, chronic gastritis, gastroduodenal ulcers, reflux esophagitis, and chronic rhinitis.[25] Physical exercise is positively correlated with subjective health.[26,27] These factors are risk factors for various diseases through their subjective symptoms and thereby influence perceived health.

Interestingly, in men, good subjective health was associated with a lack of thirst and alcohol consumption. Most healthy people adequately meet their daily water needs when their thirst is a guide.[28] The lack of appropriate water consumption is associated with several serious health problems.[29] Moderate alcohol consumption is associated with a lower risk of myocardial infarction compared to non-drinking.[30] Among current drinkers, moderate alcohol consumption was associated with better subjective health.[31]

Among women, notable differences were observed in factors such as dry mouth, number of meals per day, meal duration, sleep quality, and feelings after sweating. Dry mouth is more common in women than in men and is particularly prevalent after menopause. In healthy individuals, it can be caused by lifestyle factors such as caffeine consumption and alcohol intake, leading to discomfort.[32,33] There was no correlation between increased meal frequency and the risk of type 2 diabetes in women. However, irregular breakfast consumption has been associated with a higher risk of type 2 diabetes in women.[34] Eating 1 or 2 meals per day is more advantageous for weight control than eating 3 or more meals daily, but irregular eating habits can increase the risk of weight gain.[35] Individuals who ate quickly were twice as likely to be obese.[36] In Korea, the rate of self-perceived weight status as obese, which refers to the proportion of individuals who perceived themselves as fat despite nonobese body weight, was 84.6% in men and 94.7% in women from 2019 to 2021.[37] In women, the number of meals per day and meal duration are associated with obesity and affect their subjective health. However, our study investigated only the frequency and duration of meals. Future studies should include the amount of food consumed per meal and irregular eating habits to understand their relationship with subjective health better. Sleep quality, measured using the PSQI, is associated with subjective health status. However, several studies have reported varying results regarding sex differences.[38] Our study found that subjective health status was associated with the condition upon awakening in both men and women. These findings provide meaningful insights into sleep quality.[39] However, research on feelings after sweating is limited. In KM, feeling tired after sweating is a sign of *qi* deficiency. The most frequently reported symptoms of *qi* deficiency include lack of power or energy, tiredness or fatigue, dizziness, loss of appetite, and sweating.[40] These symptoms affect health-related quality of life.[41]

This study is one of the first to investigate the relationship between outcomes of the KM inquiry process and subjective health status. This study validated the utility of KM diagnostics by analyzing the impact of various KM diagnostic elements on subjective health status. This finding suggests that KM diagnostic methods can effectively assess the overall health status of patients. This study compared and analyzed the factors influencing subjective health status in men and women, revealing sex-based differences in health assessments. These findings can contribute to the development of sex-specific health-management strategies. By examining the impact of lifestyle factors such as meal frequency, exercise habits, and sleep quality on subjective health status, this study emphasizes the importance of healthy lifestyle habits. This provides valuable information for the development of health promotion programs.

This study has some limitations. First, due to its cross-sectional design, causal relationships based on temporal precedence could not be established. Second, the self-reported nature of the inquiry items introduces the potential for self-selection bias, as respondents may provide insincere answers, underreport negative behaviors, and overpositive behaviors. Third, this study focused on common inquiries in KM and excluded diagnostic questions specific to both children and women.

Table 4

Multivariate logistic regression of the association of subjective health status with KM inquiry in men.

Factor	Odds ratio (95% CI)	*P* value
Thirst		.017
No	Reference	
Yes	0.67 (0.49 to 0.93)	
Appetite		<.001
No	Reference	
Yes	2.27 (1.78 to 2.90)	
Digestive discomfort		<.001
No	Reference	
Yes	0.59 (0.46 to 0.75)	
Residual urine sensation		.006
No	Reference	
Yes	0.71 (0.56 to 0.91)	
Condition when waking up		<.001
Bad	Reference	
Good	2.26 (1.51 to 3.39)	
Cold sensation		.002
No	Reference	
Yes	0.64 (0.48 to 0.84)	
Alcohol		.005
No	Reference	
Yes	1.49 (1.13 to 1.98)	
Exercise (IPAQ-SF)		<.001
Low	Reference	
Medium	1.83 (1.32 to 2.55)	<.001
High	1.51 (1.16 to 1.96)	.002

CI = Confidence interval, IPAQ-SF = International Physical Activity Questionnaire Short Form.

Table 5

Multivariate logistic regression of the association of subjective health status with KM inquiry in women.

Factor	Odds ratio (95% CI)	*P* value
Dry mouth		.001
No	Reference	
Yes	0.75 (0.63 to 0.88)	
Number of meals per day		<.001
1 to 2	Reference	
3 to 5	0.75 (0.64 to 0.87)	
Meal duration		.004
≤10 min	Reference	
>10 min	1.27 (1.08 to 1.50)	
Appetite		<.001
No	Reference	
Yes	1.58 (1.37 to 1.83)	
Digestive discomfort		<.001
No	Reference	
Yes	0.57 (0.49 to 0.67)	
Residual urine sensation		.027
No	Reference	
Yes	0.84 (0.72 to 0.98)	
Condition when waking up		<.001
Bad	Reference	
Good	1.93 (1.52 to 2.46)	
Sleep quality (PSQI)		<.001
0 to 4	Reference	
5 to 21	0.66 (0.56 to 0.78)	
Feeling after sweating		<.001
Bad	Reference	
Fair	1.67 (1.32 to 2.11)	<.001
Good	1.43 (1.19 to 1.73)	<.001
Cold sensation		.006
No	Reference	
Yes	0.81 (0.70 to 0.94)	
Exercise (IPAQ-SF)		<.001
Low	Reference	
Medium	1.86 (1.52 to 2.29)	<.001
High	1.48 (1.24 to 1.75)	<.001

CI = confidence interval, IPAQ-SF = International Physical Activity Questionnaire Short Form, PSQI = Pittsburgh Sleep Quality Index.

Fourth, although the study targeted healthy adults, it also included individuals with hypertension, diabetes mellitus, and dyslipidemia, which may have influenced the results.

Based on this study, future research directions include investigating the relationship between KM inquiry outcomes and subjective health status in patients with various diseases. This study provides insights into the application of KM diagnostics to manage and improve patient health under specific medical conditions. Comparative studies of healthy individuals and patients with diseases could help to understand how KM inquiry outcomes differ and influence subjective health status under different health conditions.

5. Conclusion

This study investigated the association between KM inquiries and subjective health status in healthy adults. Factors influencing subjective health status, such as appetite, digestive discomfort, sensation of residual urine, condition on waking, cold sensation, and exercise, provide a comprehensive understanding of how subjective symptoms affect perceived health. By validating the utility of KM diagnostics and revealing sex differences in lifestyle health assessments, this study provides valuable insights for developing individualized health management strategies.

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