BMC Complementary Medicine and Therapies

RESEARCH

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Use of acupuncture among chronic disease patients attending primary healthcare facilities: a cross-sectional study in Korea

Su Yeon Lee[1,2], Soo Jeung Choi[1,2,3], Hyea Bin Im[1,2], Dain Choi[1,2] and Dongwoon Han[1,2,3,4*]

Abstract

Background Given the crucial role of integrating acupuncture treatment into primary care for managing chronic diseases, this study endeavors to identify the utilization of acupuncture among chronic disease patients seeking primary care services in Korea. Additionally, it aims to evaluate their knowledge level and perceptions related to acupuncture use.

Methods A descriptive cross-sectional study was conducted among chronic disease patients attending a primary care clinic in Korea. A self-reported questionnaire comprising 37 items was employed to evaluate the utilization of acupuncture treatment. These items covered socio-demographic information, respondents' health status, levels of acupuncture knowledge, and patterns of acupuncture use. Using the SPSS Statistics 26.0 Network Version program, descriptive statistics, a chi-square test, and a logistic regression analysis were performed to identify factors associated with acupuncture treatment.

Results Out of 370 respondents, 44.3% reported utilizing acupuncture treatment. The most popular reason for the utilization of acupuncture was to enhance the effectiveness of the current treatment. The patients with musculoskeletal disease had the highest utilization rate of 53.2%. The main source of information for acupuncture use was family and friends. The average score for the level of knowledge on acupuncture treatment among the respondents was 65.4%, and the knowledge level of the acupuncture group was high. Potential predictors of acupuncture use included musculoskeletal disease, and intention to recommend acupuncture.

Conclusion This study highlights the widespread acceptance of acupuncture use among patients with chronic diseases in primary healthcare context. Integration of acupuncture into primary care emerges as a viable avenue for effective chronic disease management, and fostering a comprehensive and holistic approach to healthcare.

Clinical trial number Not applicable.

Keywords Acupuncture, Chronic disease, Knowledge, Primary healthcare, Cross-sectional study

*Correspondence:
Dongwoon Han
dwhan@hanyang.ac.kr
[1]Department of Global Health and Development, Graduate School, Hanyang University, 222 Wangsimni-ro, Seongdong-gu, Seoul 133-791, South Korea
[2]Institute of Health Services Management, Hanyang University, Seoul, South Korea
[3]Department of Preventive Medicine, Hanyang University College of Medicine, Seoul, South Korea
[4]Faculty of Medicine, Datta Meghe Institute of Higher Education & Research, Meghe, Wardha, Maharashtra 442107, India

Background

The increasing prevalence of chronic diseases in aging populations presents a significant challenge facing healthcare systems worldwide [1]. According to the World Health Organization (WHO), chronic diseases contribute to 60% of the global burden of disease [2], with chronic pain being a major driver of ongoing medical intervention [3]. However, the use of opioids for pain management raises concerns about addiction, misuse-related side effects, and the economic burden [4–7]. As a result, non-pharmacological approaches like acupuncture have gained interest as alternative treatments for chronic conditions [6, 7], particularly in community-based primary healthcare institutions [8, 9].

Numerous studies have provided evidence supporting the safety and cost-effectiveness of acupuncture [10, 11], demonstrating its efficacy in improving symptoms and providing pain relief compared to pharmaceuticals [12, 13]. Notably, certain clinical guidelines recommend acupuncture as a primary treatment option, prioritizing it over medication [14, 15]. This recognition of acupuncture's safety, drug-free pain relief, and cost-effectiveness has led developed countries, including the United States and Europe, to recommend its use for chronic pain management [14, 16, 17]. Furthermore, some countries have adopted an integrated medical model, offering acupuncture treatment within primary care settings to address prevalent health issues [18–20].

However, the implementation of integrative care faces several challenges due to various healthcare policies, limited accessibilities, funding constraints, and negative perceptions and insufficient knowledge regarding acupuncture [20–24]. In Korea, although a substantial number of traditional Korean medicine (TKM) users opt for acupuncture [25]. However, debates regarding its effectiveness and differing perspectives among key stakeholders, such as healthcare professionals and patients, hinder its integration into the modern healthcare system [26, 27]. Consequently, understanding the perceptions and knowledge of health professionals and patients, as well as the factors influencing acupuncture use is crucial in promoting integrative care. Particularly, patients' perceptions and accurate knowledge play an important role in the decision-making process for acupuncture use [22, 28], yet there is a scarcity of studies concerning patients in this area. Therefore, this study aims to explore the use of acupuncture among chronic diseases patients in primary care settings in Korea and assess their level of knowledge and perceptions regarding acupuncture use.

Methods

Study design and participants

This study was a descriptive, cross-sectional survey conducted among patients with chronic diseases. To ensure unbiased data sampling, we collected data from six primary medical institutions in Seoul and Gyeonggi Province between November 2018 and January 2019 through face-to-face interviews using questionnaires. The sample size was determined using a formula based on the confidence interval. Based on the prevalence of acupuncture use reported in previous studies [22, 28–30], we assumed an expected acceptance rate of approximately 31%. The calculated sample size was 329, based on this assumption. To account for a potential non-response rate of 20%, the total sample size was set at 400. Participants were chronic disease patients over the age of 18 who had received treatment for the same disease for at least three months. The purpose of the survey was explained to potential participants, and only those who provided consent were allowed to participate in the self-reported survey.

The research protocol was ethically approved by the Institutional Review Board and Ethics Committee for Human Subjects Research of Hanyang University (HYI-18-208-1).

Development and validation of the questionnaire

The self-report questionnaire was developed in Korean based on a review of similar studies published in the literature [28, 29, 31–33]. For this survey iteration, a small pilot study was conducted with five patients who have chronic diseases. Minor edits were made to improve the wording and enhance clarity before distributing it. The final questionnaire consisted of 37 items, which were divided into four sections. These sections included both multiple-choice and open-ended questions. The initial section of the questionnaire consisted of seven questions regarding the participants' personal information, including gender, age, education level, occupation, annual family income, type of health insurance, and residential area. The second section consisted of 12 questions regarding respondents' health status, type of chronic disease (Check all conditions you've had for more than 3 months), characteristics related to the chronic disease, self-perceived severity of the disease (rated on a 5-point scale from "not at all" to "very much"), and their treatment for the chronic disease (also rated on a 5-point scale from "not at all" to "very much").

The third section of the questionnaire on patients' knowledge of acupuncture was based on a previous study [28] and modified for Korea, consisting of 19 questions related to participants' knowledge of acupuncture. This section comprises items designated as a "true (T) or false (F)" question, a type of assessment in which participants are presented with a statement and are required to determine whether it is true or false. The objective of this assessment is to evaluate the subject's knowledge regarding the various facets of acupuncture. These aspects

include common concerns about acupuncture (6 items), government regulations (2 items), acupuncture efficacy (2 items), types of acupuncture (1 item), methods of performing acupuncture (2 items), and general knowledge of acupuncture (6 items). Knowledge of acupuncture was categorized into three levels based on the number of correct responses to the 19 knowledge items: low (0–9), moderate (10–14), and high (15–19). The final section of the questionnaire consisted of 14 questions regarding the use of acupuncture. The first question asked participants if they had used acupuncture in the past 12 months. Other questions in this section explored the reasons for acupuncture use, the respondents' attitudes and perceptions about acupuncture, their intention to continue using acupuncture, their satisfaction with acupuncture, and the sources of information they had received regarding acupuncture.

Statistical analysis

In this study, the collected data of 370 participants were analyzed using SPSS Program version 26.0. The descriptive statistics were used to examine the respondents' demographic characteristics, attitudes, and perceptions regarding acupuncture use. The knowledge score can be obtained as a perfect score of 100% when all responses to the item are correct, and frequencies and percentages were obtained by dividing the patients into groups of having used acupuncture and not having used acupuncture. A chi-squared test was used to determine if there were significant associations between participant characteristics and their use of acupuncture. An independent t-test was used for two groups to assess the level of acupuncture knowledge among participants, while ANOVA was used for comparisons involving three or more groups. In addition, a logistic regression model was used to identify predictive factors associated with acupuncture use. Statistical significance was determined based on a two-tailed p-value of less than 0.05.

Results

Sociodemographic and health-related characteristics of the study participants

Table 1 summarizes the sociodemographic and health-related characteristics of the 370 participants in this study. The mean age was 51.13 years old (SD=16.55). The majority were more than half female (59.2%), had more than a high school degree (87.9%), and were housewives (28.1%). A significant difference was found between acupuncture users and non-users in terms of age and monthly income. Acupuncture was used more frequently by those aged 50 or older (56.7%) and those with a monthly income of 3 million KRW or more (57.3%).

Regarding health-related characteristics, the majority of participants reported low sleep disorders (56.5%; $p=0.016$), low disease severity (76.8%; $p=0.028$), moderate acupuncture knowledge (60.3%; $p=0.038$), and a positive impression of acupuncture (64.3%; $p<0.001$). There was a statistically significant difference between acupuncture users and non-users with respect to these characteristics. The top three disease categories leading to acupuncture visits were musculoskeletal diseases (53.2%), digestive system diseases (29.7%), and hypertension (26.2%).

Average comparison of study participant's level of acupuncture knowledge and sociodemographic characteristics

The sociodemographic and health-related characteristics of the study participants and their knowledge scores related to acupuncture are presented in Table 2. Participants answered 19 knowledge items, and the mean knowledge score was 12.43(SD=3.16). Significant differences in knowledge scores were observed among participants with different levels of education ($F=12.620$, $p<0.001$), income levels ($t=2.436$, $p<0.05$), musculoskeletal diseases ($t = -2.017$, $p<0.05$), various cancers ($t = -1.976$, $p<0.05$), use of acupuncture ($t = -2.232$, $p<0.05$), and acupuncture recommendations ($F=14.274$, $p<0.001$). Responses to the level of acupuncture knowledge of the participants are summarized in Supplement 1.

Overall, 65.4% of respondents correctly answered questions about their knowledge of acupuncture (Fig. 1). Particularly, 89.5% of the participants were aware that acupuncture treatment helps with pain relief, and over 78% of the participants were knowledgeable about health insurance coverage and licensing requirements for acupuncturists. However, the participants had low levels of knowledge about the different types of acupuncture and the common concerns about acupuncture. The correct answer rate was the lowest for questions related to the side effects of acupuncture, with only 26.5% knowing that some patients may experience dizziness after their first acupuncture treatment.

Reason and pattern of acupuncture utilization

Out of the 164 acupuncture users, 44.5% used acupuncture to enhance the treatment effect, 33.5% used it based on a recommendation from a friend, 28.7% sought it for pain relief, and 25.0% used it as an alternative therapy. The majority of users obtained information about acupuncture from their family or relatives (36.4%), followed by friends (35.2%), and themselves (29.6%). Satisfaction with acupuncture was evaluated, with 48.2% rating acupuncture as 'neutral' and 45.1% rating it as 'satisfaction'. Only 37.8% of acupuncture users disclosed their use to healthcare providers. The majority of the participants did not disclose their use because they did not consider

Table 1 Sociodemographic and health-related characteristics of participants

Variables	Total (*N* = 370)	Users (*N* = 164)	Non-users (*N* = 206)	*p*-value
	N (%)	*N* (%)	*N* (%)	
Gender				
Male	151 (40.8)	65 (39.6)	86 (41.7)	0.750
Female	219 (59.2)	99 (60.4)	120 (58.3)	
Mean age (year)`	51.13 ± 16.55			
< 40	100 (27.0)	35 (21.3)	65 (31.6)	0.005**
40–49	95 (25.7)	36 (22.0)	59 (28.6)	
≥ 50	175 (47.3)	93 (56.7)	82 (39.8)	
Education level				
Lower than middle school	45 (12.2)	21 (12.8)	24 (11.7)	0.694
High school	95 (25.7)	45 (27.4)	50 (24.3)	
College or above	230 (62.2)	98 (59.8)	132 (64.1)	
Income				
< 3 million KRW	179 (48.4)	70 (48.4)	109 (52.9)	< 0.050*
≥ 3 million KRW	191 (51.6)	94 (57.3)	97 (47.1)	
Occupation				
Housewife	104 (28.1)	47 (28.7)	57 (27.7)	0.942
Profession	102 (27.6)	47 (28.7)	55 (26.7)	
Service position	43 (11.6)	19 (11.6)	24 (11.7)	
Other	121 (32.7)	51 (31.1)	70 (34.0)	
Main diagnosis[bc]				
Musculoskeletal disease	197 (53.2)	109 (66.5)	88 (42.7)	< 0.001***
Digestive system disease	110 (29.7)	51 (31.1)	59 (28.6)	0.608
Hypertension	97 (26.2)	44 (26.8)	53 (25.7)	0.811
Endocrine disease	60 (16.2)	29 (17.7)	31 (15.0)	0.495
Respiratory disease	57 (15.4)	26 (15.9)	31 (15.0)	0.831
Cardiovascular disease	55 (14.9)	26 (15.9)	29 (14.1)	0.633
Neurological disease	38 (10.3)	23 (14.0)	15 (7.3)	0.034*
Skin disease	34 (9.2)	13 (7.9)	21 (10.2)	0.453
Various cancers	11 (3.0)	4 (2.4)	7 (3.4)	0.761[d]
Subjective sleep quality[a]				
Poor	209 (56.5)	91 (55.5)	118 (57.3)	0.016*
Fair	117 (31.6)	45 (27.4)	72 (35.0)	
Good	44 (11.9)	28 (17.1)	16 (7.8)	
Perceived severity of disease[e]				
Not severe	284 (76.8)	117 (71.3)	167 (81.1)	0.028*
Severe	86 (23.2)	47 (28.7)	39 (18.9)	
Acupuncture knowledge level[f]				
Low	55 (14.9)	16 (9.8)	39 (18.9)	0.038*
Middle	223 (60.3)	102 (62.2)	121 (58.7)	
High	92 (24.9)	46 (28.0)	46 (22.3)	
Treatment period				
Less than 6 months	128 (34.6)	54 (32.9)	74 (35.9)	0.583
6 months to less than 5 years	126 (34.1)	54 (32.9)	72 (35.0)	
More than 5 years	116 (31.4)	56 (34.1)	60 (29.1)	
Intention to recommend acupuncture				

Table 1 (continued)

Variables	Total (*N* = 370)	Users (*N* = 164)	Non-users (*N* = 206)	*p*-value
	N (%)	*N* (%)	*N* (%)	
Yes	238 (64.3)	135 (82.3)	103 (50.0)	< 0.001***
No	41 (11.1)	10 (6.1)	31 (15.0)	
Don't know	91 (24.6)	19 (11.6)	72 (35.0)	

[a] Participants were asked to rate their subjective sleep quality level (rated on a 5-point scale from "Poor: 1, 2", "Fair: 3" to "Good: 4, 5")

[b] Columns do not add up to 100% due to the selection of multiple answers

[c] Physician-diagnosed diseases and conditions (yes vs. no)

[d] Fisher's exact test

[e] Participants were asked to rate their perceived severity of disease level (rated on a 5-point scale from "Not severe: 1–3" to "Severe: 4–5")

[f] Participants were scored on their level of knowledge on acupuncture ("Low: less than 10 points"; "Middle: 10–14 points" to "High: 15–19 points")

*: $p<0.05$, **: $p<0.01$, ***: $p<0.001$

it important to do so (49.0%) or because they were not asked by their healthcare providers (27.5%). These findings are summarized in Table 3.

Respondents' intention for to continue using acupuncture

Table 4 showed that the majority of those who have had acupuncture were in favor of repeating or continuing it in the future, while 9.1% said they would not. The most common reason for continuing to use acupuncture was its effectiveness (67.8%), followed by accessibility, low side effects, and no pain during treatment. Conversely, reasons for discontinuing acupuncture included lack of treatment effect, pain during treatment, high cost, and other factors.

Potential predictors of acupuncture use

The results of the multivariate logistic regression analysis are presented in Table 5. The analysis revealed that two variables were independently associated with acupuncture use: musculoskeletal disease (OR: 2.29, CI: 1.43–3.68) and receiving a recommendation for acupuncture (OR: 4.06, CI: 2.21–7.47).

Discussion

This study explored the patterns of acupuncture usage among patients with chronic diseases in Korea and examined their level of knowledge regarding its use. Notably, nearly half of them used acupuncture as a therapeutic intervention. Consistent with previous research [29, 34, 35], a higher utilization of acupuncture was observed, especially among individuals diagnosed with musculoskeletal and neurological disorders. Additionally, the study revealed that 90.9% of acupuncture users expressed their intention to continue utilizing acupuncture, with 67.8% reporting its effectiveness. Despite observing a correlation between education level and knowledge of acupuncture, the study did not consistently find this translating into actual utilization of acupuncture therapy [29].

Previous research indicates the use of acupuncture was associated with older age [29, 34, 36]. In this study, a similar trend was observed, with older individuals showing a greater inclination to utilize acupuncture; however, age did not stand out as a significant predictor of acupuncture utilization. As age advances, interest in health issues tends to increase, and individuals may turn to acupuncture based on prior experiences [29, 34, 35, 37]. While chronic diseases can affect individuals of all ages, elderly people are more likely to have two or more complex conditions [34, 38], leading them to visit primary care facilities more frequently [39, 40].

Among chronic diseases, musculoskeletal diseases are considered one of the most significant burdens [38, 41]. In our study, acupuncture use was notably associated with musculoskeletal disease ($p<0.001$). These findings align with research from surveys conducted in the U.S., Germany, and Norway, which also reported a higher likelihood of acupuncture usage among individuals with musculoskeletal diseases [29, 36, 42]. This is consistent with several studies [43, 44] demonstrating the efficacy of acupuncture in the management of musculoskeletal disorders and highlights its potential as a valuable treatment option for conditions such as chronic pain.

The use of acupuncture is influenced by the availability of health insurance coverage. Several countries have expanded the coverage of acupuncture within health insurance schemes to reduce the financial burden on elderly patients with chronic diseases and improve healthcare access [45–47]. In Korea, the national health insurance scheme covers traditional Korean medicine, including acupuncture, with reduced out-of-pocket expenditure for the elderly. This coverage has increased accessibility to acupuncture services, contributing to the high utilization rate in Korea compared to other countries. Previous studies suggest that expanding health insurance coverage for acupuncture services can lead to increased utilization [48–52]. For instance, in Oregon, United States, the expansion of coverage for complementary and alternative medicine (CAM) services under

Table 2 Comparison of knowledge levels of acupuncture based on participant characteristics

Variables		Total (*N* = 370)	Mean ± SD	t/F[d]	*p*-value
Gender					
Female		219	12.43 ± 3.28	0.017	0.986
Male		151	12.43 ± 2.99		
Age					
< 40		100	12.85 ± 2.67	2.575	0.078
40–49		95	12.69 ± 3.36		
≥ 50		175	12.43 ± 3.16		
Education level					
Lower than middle school		45	11.00 ± 3.35	12.620	< 0.001***
High school		95	11.63 ± 3.25		
College or above		230	13.04 ± 2.92		
Income					
< 3 million KRW		179	12.02 ± 3.25	-2.436	0.015*
≥ 3 million KRW		191	12.81 ± 3.03		
Occupation					
Housewife		104	12.74 ± 2.89	0.568	0.636
Profession		102	12.21 ± 3.75		
Service position		43	12.51 ± 2.22		
Other		121	12.31 ± 3.13		
Subjective sleep quality[a]					
Poor		209	12.72 ± 2.92	2.639	0.073
Fair		117	11.89 ± 3.70		
Good		44	12.45 ± 2.44		
Main diagnosis[b]					
Neurological disease	No	332	12.42 ± 3.11	-0.042	0.967
	Yes	38	12.45 ± 3.60		
Musculoskeletal disease	No	173	12.08 ± 3.28	-2.017	0.044*
	Yes	197	12.74 ± 3.02		
Endocrine disease	No	310	12.40 ± 3.09	-0.418	0.676
	Yes	60	12.58 ± 3.52		
Cardiovascular disease	No	315	12.50 ± 3.14	1.041	0.299
	Yes	55	12.02 ± 3.23		
Digestive system disease	No	260	12.28 ± 3.21	-1.335	0.183
	Yes	110	12.76 ± 3.02		
Respiratory disease	No	313	12.38 ± 3.25	-0.668	0.504
	Yes	57	12.68 ± 2.62		
Hypertension	No	273	12.56 ± 3.19	1.365	0.173
	Yes	97	12.05 ± 3.04		
Skin disease	No	336	12.37 ± 3.10	-1.111	0.267
	Yes	34	13.00 ± 3.68		
Various cancers	No	359	12.37 ± 3.16	-1.976	0.049*
	Yes	11	14.27 ± 2.53		
Perceived severity of disease[c]					
Not severe		284	12.49 ± 3.22	2.024	0.490
Severe		86	12.22 ± 2.95		
Use of acupuncture					
No		206	12.10 ± 3.31	-2.232	0.026*
Yes		164	12.84 ± 2.92		
Intention to recommend acupuncture					

Table 2 (continued)

Variables	Total (*N* = 370)	Mean ± SD	t/F[d]	*p*-value
No	41	10.59 ± 2.86	14.274	< 0.001***
Yes	238	13.01 ± 3.07		
Don't know	91	11.73 ± 3.08		

[a] Participants were asked to rate their subjective sleep quality level (rated on a 5-point scale from "Poor: 1, 2", "Fair: 3" to "Good: 4, 5")

[b] Columns do not add up to 100% due to the selection of multiple answers

[c] Participants were asked to rate their perceived severity of disease level (rated on a 5-point scale from "Not severe: 1–3" to "Severe: 4–5")

[d] Independent *t*-test was used when comparing two groups, and ANOVA was used when three or more groups were compared

*: $p < 0.05$, ***: $p < 0.001$

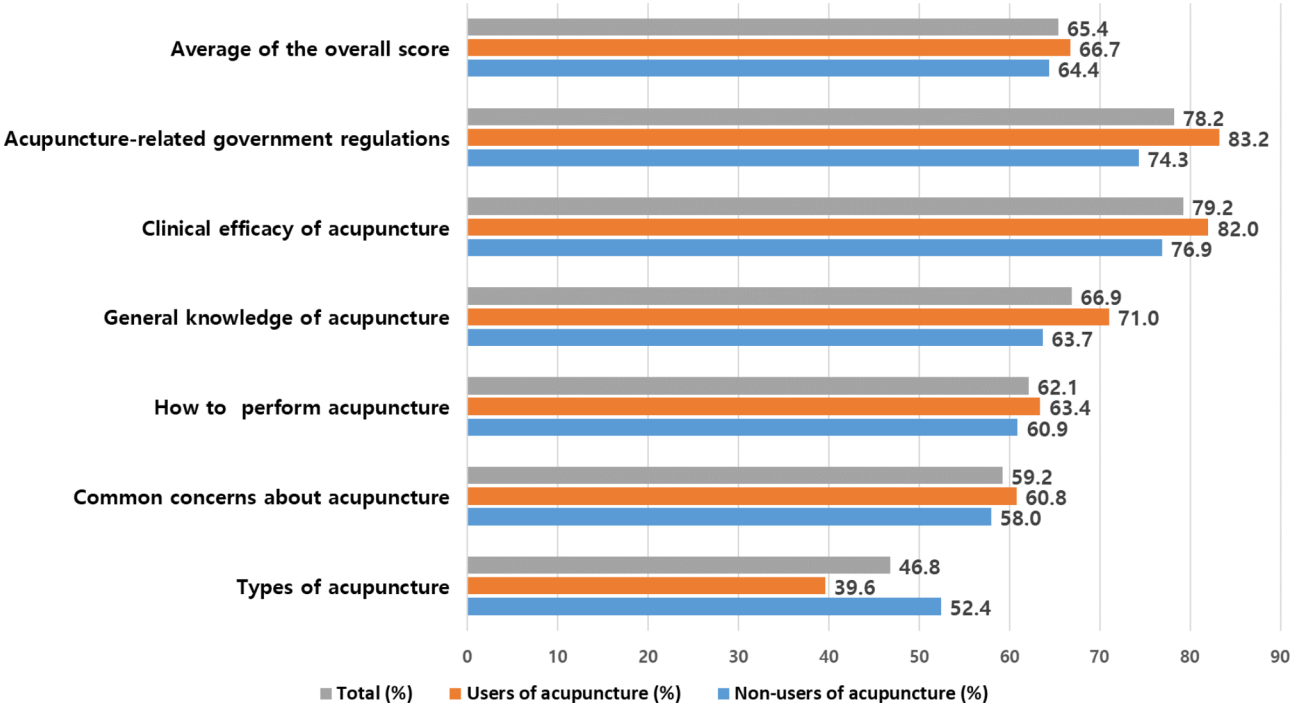

Fig. 1 Level of acupuncture knowledge between acupuncture users and non-users

Medicaid resulted in a significant rise in acupuncture utilization [52]. Similarly, in countries like Austria, Taiwan, Germany, and Italy, health insurance partially covers acupuncture for specific conditions such as musculoskeletal and nervous system diseases, making it more accessible to patients in primary care settings [48–51]. The increasing inclusion of acupuncture within health insurance coverage in many countries signifies its growing acceptance as a potential treatment option.

Despite its widespread use, the effectiveness and safety of acupuncture have not been thoroughly evaluated. Therefore, promoting effective communication between healthcare professionals and patients about acupuncture use is imperative to mitigate potential side effects and optimize the treatment outcome [53–55]. However, our findings revealed that only 37.8% of patients engaged in communication with their physicians regarding acupuncture use. This low communication rate is primarily due to inadequate patient awareness about the importance of discussing complementary medical practices with their physicians, as well as challenges in effectively communicating with healthcare providers. This reflects a common issue worldwide, where the conventional medical system and traditional medicine system are often perceived as separate entities, leading to patient hesitation when discussing the use of complementary alternative medicine. Nonetheless, open and transparent communication among conventional healthcare providers, traditional Korean medicine doctors, and patients is essential to minimize potential side effects and provide optimal patient care. The National Institutes of Health (NIH) recommends that physicians provide information about complementary and alternative medicine (CAM) to their patients and actively involve them in healthcare decisions [55]. Such communication empowers patients, fosters collaboration between healthcare systems, and enhances

Table 3 Reason and pattern of acupuncture use patients (*N* = 164)

Variables	*N*	%
Reasons for acupuncture use[a]		
Increase the effectiveness of treatment	73	44.5
Recommendations from people around	55	33.5
Pain relief	47	28.7
As an alternative	41	25.0
To increase the duration of pain relief	20	12.2
Disease prevention and health promotion	16	9.8
Low cost of acupuncture	12	7.3
Hate taking medicine	9	5.5
Curiosity	2	1.2
Others	3	1.8
Sources of information[a]		
Family or relatives	59	36.4
Friends	57	35.2
On one's own	48	29.6
From patients with the same disease	21	13.0
Medical advice	16	9.9
Media	10	6.2
Internet or book	5	3.1
Others	2	1.2
Disclosure to health care providers		
Yes	62	37.8
No	102	62.2
Reasons for non-disclosure		
Not important to disclose	50	49.0
Never asked by the health care provider	28	27.5
Healthcare providers do not like it	13	12.7
Healthcare providers unlikely to know	6	5.9
Others	5	4.9
Satisfaction of acupuncture treatment		
Satisfaction	74	45.1
Neutral	79	48.2
Dissatisfaction	8	4.9
No response	3	1.8

[a] Columns do not add up to 100% due to the selection of multiple answers

Table 4 Reported reasons for the continuation or discontinuation of acupuncture use (*N* = 164)

Variables	*N*	%
Continue to use[a]	149	90.9
Effective in treatment	101	67.8
Accessibility	29	19.5
Low side effects	26	17.4
No pain during treatment	19	12.8
Low cost	13	8.7
Reduction in number of medications	10	6.7
Reduction in number of visits to medical institutions	4	2.7
Others	6	4.0
Discontinue the use[a]	15	9.1
No treatment effect	9	60.0
Pain during treatment	5	33.3
Expensive cost	1	6.7
Poor accessibility	1	6.7
Others	1	6.7

[a] Columns do not add up to 100% due to the selection of multiple answers

Table 5 Multivariate logistic regression analysis between the use of acupuncture and participant characteristics

Variables	OR	95% CI	*p*-value
Age			
< 40		Ref.	
40–49	1.03	0.54–1.99	0.971
≥ 50	1.78	1.00-3.18	0.051
Income			
< 3 million KRW		Ref.	
≥ 3 million KRW	1.55	0.97–2.48	0.069
Subjective sleep quality[a]			
Poor		Ref.	
Fair	0.88	0.52–1.49	0.635
Good	2.04	0.87–4.82	0.103
Main diagnosis			
Musculoskeletal disease	2.29	1.43–3.68	< 0.001***
Neurological disease	1.74	0.81–3.71	0.155
Perceived severity of disease[b]			
Not serve		Ref.	
Severe	1.07	0.57–2.02	0.837
Acupuncture knowledge level[c]			
Low		Ref.	
Middle	1.48	0.72–3.04	0.285
High	1.41	0.62–3.19	0.412
Intention to recommend acupuncture			
Don't know		Ref.	
Yes	4.06	2.21–7.47	< 0.001***
No	1.13	0.45–2.86	0.794

[a] Participants were asked to rate their subjective sleep quality level (rated on a 5-point scale from "Poor: 1, 2", "Fair: 3" to "Good: 4, 5")

[b] Participants were asked to rate their perceived severity of disease level (rated on a 5-point scale from "Not severe: 1–3" to "Severe: 4–5")

[c] Participants were scored on their level of knowledge on acupuncture ("Low: less than 10 points"; "Middle: 10–14 points" to "High: 15–19 points")

***: $p < 0.001$

the integration of acupuncture into patient care. By establishing a robust communication framework, healthcare providers can effectively address patients' concerns, impart comprehensive education on the potential benefits and associated risks of acupuncture, and facilitate well-informed decisions that contribute to enhanced patient well-being.

Integrated care has the potential to enhance access to primary care and improve service quality. To effectively integrate acupuncture into primary healthcare settings, healthcare professionals must possess knowledge about acupuncture, and patients must be willing to incorporate it into their treatment [22]. Patient willingness to use acupuncture is influenced by their experiences with the therapy and their understanding of its effectiveness and potential side effects [22]. This study supports

previous literature by demonstrating that acupuncture users exhibit a higher level of knowledge about acupuncture compared to non-users [22, 28, 30]. While acupuncture users demonstrated considerable knowledge about government regulations (83%) and the efficacy of acupuncture (82%), their understanding of acupuncture types (40%) and safety concerns, including potential adverse effects (61%), was relatively low. The significant level of knowledge regarding acupuncture's efficacy suggests patients' expectations of its therapeutic benefits. However, in contrast to a UK study [28] that reported high knowledge levels exceeding 80% regarding acupuncture's safety and side effects, this study reveals a knowledge gap in these areas. Therefore, efforts to improve patient education and understanding of acupuncture safety and types are necessary to enhance the utilization and effectiveness of acupuncture as a complementary therapeutic option.

In Korea, patients often rely on incorrect information from the general public rather than seeking specific information about acupuncture therapy from healthcare professionals. Our study revealed the influence of family, friends, and acquaintances on the use of acupuncture services, which aligns with previous research [22, 28, 32, 34]. These findings emphasize the importance of seeking reliable information from medical experts rather than solely relying on limited information from personal networks. Relying on inaccurate information can lead to misinformation and misunderstandings about the potential side effects of acupuncture [31]. These findings highlight the need for proper education and communication between healthcare providers and patients to ensure informed decision-making about acupuncture as a complementary therapy. Enhanced patient education and transparent communication are essential to mitigate risks and optimize the benefits of acupuncture, thereby improving patient outcomes and fostering a more integrated healthcare approach.

The level of knowledge regarding acupuncture varies depending on the patient's illness. Patients with musculoskeletal disorders and cancer demonstrated relatively high overall knowledge of acupuncture compared to other patient groups, suggesting a greater interest in its effectiveness for pain relief. Furthermore, the study revealed that 82% of acupuncture users who had positive experiences and good knowledge of acupuncture were likely to recommend it to others, aligning with similar findings in Australia (95%) and the United States (96%) [22, 56]. This highlights the significant influence that patients' trust in acupuncture, formed through their own experiences and knowledge, can have on their decisions regarding its use [11].

The study has several limitations that may have influenced its findings. First, the participants had a higher education level compared to respondents in other studies, with nearly half of them holding a bachelor's degree or higher. This educational disparity could have influenced the study outcomes and may not fully represent the general population. Second, the survey was only conducted in only 6 hospitals in Seoul and Gyeonggi Province of Korea, which may limit the generalizability of the findings to the entire population. Future research should investigate subjects with specific diseases to obtain more accurate and specific results. Third, the study found that the majority of chronic disease patients had multiple comorbidities. However, it was not possible to determine whether the use of acupuncture was causally influenced by these comorbidities or other treatment modalities. This limitation makes it difficult to establish a causal relationship with the use of acupuncture. Fourth, as the primary objective of this study was to assess the level of awareness and knowledge of acupuncture among patients with chronic diseases, it has inherent limitations in demonstrating the efficacy of acupuncture or identifying specific indications for various symptoms within this population. Therefore, further research is necessary to gain a more comprehensive understanding of the effects of acupuncture and its associations with chronic diseases. Lastly, although it is widely recognized that the financial burden is a significant barrier to acupuncture access, this study did not collect sufficient data to analyze this particular aspect. Further research is needed to explore the impact of financial factors on the utilization of acupuncture and healthcare expenditure among users.

Conclusion

The widespread use of acupuncture among chronic disease patients seeking primary care services in Korea underscores its perceived therapeutic benefits and the strong desire for its continued use. The high level of awareness observed among these patients underscores the need for a collaborative approach between conventional primary care treatment modalities and acupuncture. This underscores the imperative for developing comprehensive guidelines and continuing research efforts for chronic disease management in the primary care settings, aimed at ensuring optimal treatment outcomes.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12906-024-04699-5.

Supplementary Material 1

Acknowledgements

The authors extend their heartfelt gratitude to all participants for their valuable cooperation and to their support.

Author contributions
SY, SJ, HB, DI, and DW were responsible for the study concept and design. SY and DW contributed to the design of the data collection tools and data collection. SY and DW analyzed the data and drafted the manuscript. SY, SJ, HB, DI, and DW critically reviewed the manuscript and contributed intellectual content. All authors have read and approved the final manuscript.

Funding
Not applicable.

Data availability
The data will be accessible by contacting the corresponding author of this study.

Declarations

Ethics approval and consent to participate
The study protocol was ethically approved by the Institutional Review Board on Human Subjects Research and Ethics Committees, Hanyang University, Seoul, Korea (HYI-18-208-1). Enrollment of the respondents was voluntary, and all patients gave written informed consent to participate in the study.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

Received: 31 August 2023 / Accepted: 2 November 2024
Published online: 07 January 2025

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