



Investigation on the Satisfaction of Musculoskeletal Problems to Acupuncture and Moxibustion in Japan

ISHIZAKI Naoto, FUKUDA Fumihiko, YANO Tadashi

Department of Clinical Acupuncture and Moxibustion, Meiji University of Integrative Medicine

ABSTRACT

Musculoskeletal problem is one of the most common and costly health problems and considerable number of the patient with chronic low back pain seek complementary or alternative medical (CAM) care²). Results of a survey in the U.S. indicated that high knowledge of the therapy significantly influence patients' willingness to try it for their back pain³). Although approximately 60% of the residents have moderate or higher knowledge of acupuncture and moxibustion⁴) and more than 20% of the population had one or more experience in their lifetime in Japan¹), it is still unclear that how many percent of the patients with musculoskeletal problems have tried acupuncture and/or moxibustion and whether they had satisfied with the treatment, as compared with the other health care modalities. In the present study, we intended to clarify these questions through further analysis of a nation-wide survey which was conducted in 2007.

KEYWORDS

Acupuncture and moxibustion; Satisfaction; Low back pain; Shoulder stiffness; Knee pain.

1. Introduction

The authors had been conducted annual nationwide surveys every year from 2003 through 2007 and in 2012 on the utilization of acupuncture in Japan in which respondents were encouraged to fill a questionnaire regarding use of acupuncture and moxibustion.

According to the series of surveys, annual utilization of acupuncture in the nation from 2003 to 2006 were 6.5%, 4.8%, 6.4%, and 6.7% respectively, while experience in their life time were estimated as 26.7%, 19.4%, 24.4% and 25.4%, respectively¹). Respondents who had utilized acupuncture and/or moxibustion tended to be older than those who had no experience. We had also found from the surveys that acupuncture was mainly used for musculoskeletal symptoms (81.6% of respondents), and a breakdown of the musculoskeletal symptoms showed that top three symptoms for which acupuncture was sought by the patients were low back pain (50.9%), shoulder stiffness (35.9%) and knee pain (12.0%).

2. Methods

2.1 Subjects and Sampling Methods

The data was collected as part of omnibus surveys which were conducted by a research company (Central Research Services, Inc. Tokyo, Japan) in March 2007 with the support of Public Interest Incorporated Foundation for Training and Licensure Examination in Amma-Massage-Acupressure, Acupuncture and Moxibustion (Toyo Ryoho Kenshu Siken Zaidan)⁵. The subjects of the survey were individuals whose age was 20 years or older and who were randomly selected from Japanese population. The data were collected as a part of omnibus questionnaire that was brought to the individuals by interviewers. The subjects were then asked to answer closed-ended questions regarding usage of and satisfaction with acupuncture and/or moxibustion treatment. Sampling method of the survey was as following: All municipalities in Japan were divided geographically into 12 blocks, which was further stratified into 30 areas according to the city scale (major cities, cities, and towns or villages). From the 30 areas stratified, 157 local areas were selected in the random manner according to the population size to obtain 10-14 samples from a local point, which will be a total of 2,000 samples.

2.2 Questions Asked

Questions in the survey included overall utilization of acupuncture and/or moxibustion within the past 12 month and lifetime experience as well as basic characteristics of the respondents such as age, gender, education level and occupation. Also, we asked whether they had sought any health care services for one or more of the following musculoskeletal problems: 1) low back pain,

Table 1. Utilization of acupuncture/moxibustion by respondents

experie nce	overall		(S D)	men		(S D)	wo men		num ber	(%) ^a	ag e	(S D)
	num ber	(%) ^a		num ber	(%) ^a		num ber	(%) ^a				
	(1.5)		(10)	(0.8)					15	(2. 1)	64	(1 1)
saw practiti oner												
current ly	num ber	age mean		num ber	age mean	(S D)						
treatm ent	20	63		5	60	(8)						
within	40 (3.1)	56 (14	)	11 (1.8)	53 (16	)	29 (4.		83 (11		58 (1	3)
12 month	160 (12.2)	55 (17	)	8 (1.3)	56 (18	)	9) (11				54 (1	6)
more than 1	10 (0.8)	55 (12	)	23 (3.8)	57 (13)						
year	279 (4.1)	56 (12	)	124 (20.4)	56 51 (13)						
ago	1029 (21.3)	51 ^d (17	)	485 (79.6)	53 (12)						
7	7 (0.5)	58 (13	)	5 (0.8)	52 (16)						
1315		52 (15	)	614 (46.7)								
self applica tion at home												
within												
12									2 (0. 3)		54 (1	7)
									18 (4. 3)		53 (1	4)

month	(17)	(18)		
more than 1 year ago	(17)			
subtotal ^{b, c}		155	(22 .2)	56 (1 5)
none		544	(77 .8)	50 (1 6)
don't know		2	(0. 3)	71 (1 0)
total ^c		701	(53 .3)	51 (1 6)

2) shoulder stiffness and 3) knee pain and whether they had satisfied with the treatment used. Since the time and the number of questions was limited in the survey, satisfaction with the treatment was obtained simply as binary answers (yes or no). The options for the treatment were categorized as conventional medicine, osteopathy/chiropractic, amma/massage/shiatsu, acupuncture and moxibustion, herbal medicine (kampo) prescribed by physician, over the counter kampo, aromatherapy and others.

2.3 Statistical Analysis

Percentages in the descriptive statistics were provided with the 95% confidence intervals (95% CIs) which were estimated based on binomial distribution. Fisher's exact test was performed to detect significant differences between proportions where necessary. Student's t-test was performed in order to detect significant difference in mean age of the respondents with and without experience of acupuncture and/or moxibustion. Differences were considered statistically significant when type I error (α) was <5% under null hypothesis. All the computation was performed with R statistical software package (ver. 3.5.0) 6).

3. Results

a: denominator (1308, 609 and 699 for men and women respectively) for calculation of the percentage was defined as the total respondents except who answered 'do not know' b: total of those who had experienced acupuncture in any form sometime in their life c: summation of each column in the total/subtotal number will not be equal to the total number of the respondents because of multiplied answers d: $p < 0.001$ v.s. those with experience of acupuncture and/or moxibustion by Student's t-test

Difference in the proportion of utilization between men and women are found when compared in terms of the period of within 12 month (including current usage) (16/609 in men v.s. 44/699 in women, $p = 0.0014$), however the difference was not significant in their lifetime experience (124/609 in men v.s. 155/699 in women, $p = 0.4568$) (Fisher's exact test).

Of the 2,000 individuals visited by the interviewers, 1,315 (65.8%) responded. Of those responded, 60 (4.6%) had visited acupuncture clinic in the past 12 month, while 279 (21.3%) reported their lifetime experience including their own use at home (Table 1). Mean (SD) age of the respondents with and without experience of acupuncture in their life time were 56 (15) and 51 (17), indicating statistical significance ($P < 0.01$). There was a significant difference in utilization of acupuncture and/or moxibustion within 12 months between men and women, but not in their lifetime experience.

Characteristics of the subjects by experience of treatment for low back pain, shoulder stiffness, and knee pain are summarized in Table 2. Among the three kinds of musculoskeletal symptoms, low back pain (LBP) was the highest for which the subjects sought some kind of health care services (34.2%, 95%CI,31.7-36.9%), followed by shoulder stiffness (19.7%, 95%CI, 17.622.0%) and knee pain (14.5%, 95%CI, 12.7-16.5%). Also, number of the subjects who reported more than two symptoms for which health care services was sought were highest for combination of low back pain and shoulder stiffness (8.8%, 95%CI, 7.3-10.4%), followed by combination of services for all of the three symptoms was 3.7% (95%CI, 2.8-4.9%).

2. Experience of musculoskeletal problems and satisfaction with the treatment used

Table 2. Characteristics of the subjects by clinical symptoms for which healthcare services were sought

Table 2. Characteristics of the subjects by clinical symptoms for which healthcare services were sought

condition ^a	LBP	SS	KP	LBP and SS	LBP and KP	SS and KP	ALL	none	overall
number	450	259	191	115	62	15	49	705	1315
(M/F)	(216/234)	(74/185)	(62/129)	(34/81)	(28/34)	(1/14)	(15/34)	(355/350)	(614/701)
%	34.2	19.7	14.5	8.8	4.7	1.1	3.7	53.7	100.0
(M/F) ^b	(35.2/33.3)	(12.1/26.4)	(10.0/18.4)	(5.5/11.6)	(4.6/4.9)	(0.2/2.0)	(2.4/4.9)	(57.9/49.9)	(100.0/100.0)
95%CI	31.7-36.9	17.6-22.0	12.7-16.5	7.3-10.4	3.6-6.0	0.6-1.9	2.8-4.9	50.9-56.4	-
mean[SD] age	55 [16]	54 [15]	59 [16]	53 [15]	60 [16]	63 [9]	58 [16]	49 [17]	52 [17]
(M/F)	(56 [16]/53 [16])	(57 [16]/52 [14])	(56 [19]/60 [15])	(61 [14]/50 [14])	(56 [17]/62 [15])	(73 [-]/62 [9])	(57 [20]/58 [14])	(50 [18]/49 [16])	(52 [18]/51 [16])
occupation ^c									
A/F/F	9(2.0)	3(1.2)	6(3.1)	0(0.0)	3(4.8)	0(0.0)	2(4.1)	18(2.6)	29(2.2)
C/I	64(14.2)	46(17.7)	22(11.5)	18(15.7)	6(9.7)	2(13.3)	9(18.4)	74(10.5)	162(12.3)
office worker	66(14.7)	42(16.2)	12(6.3)	21(18.3)	3(4.8)	0(0.0)	6(12.2)	125(17.7)	209(15.9)
laborer	84(18.7)	45(17.4)	37(19.4)	18 (15.7)	11(17.7)	4(26.7)	5(10.2)	163(23.1)	286(21.7)
I/A	11(2.4)	5(1.9)	5(2.6)	3(2.6)	2(3.2)	0(0.0)	2(4.1)	25(3.5)	37(2.8)
Housewife	113(25.1)	84(32.4)	62(32.5)	40(34.8)	16(25.8)	7(46.7)	14(28.6)	165(23.4)	333(25.3)
Student	5(1.1)	2(0.8)	4(2.1)	1(0.9)	2(3.2)	0(0.0)	1(2.0)	20(2.8)	26(2.0)

Table 2 shows kind of treatment used by the patients who had experienced low back pain sometimes in their life time. Of 450 who experienced low back pain and sought some kind of treatment, 287 (63.8%) used one kind, 109 (24.2%) used two kinds and 54 (12.0%) used more than three kinds of treatment for the problem. Among those who used some kind of treatment for low back pain, 172 (38.2%, 95%CI, 33.7-42.9%) used medication or injection in Western medical hospital. Osteopathy or Chiropractic (35.3%, 95%CI, 30.9-39.9%), rehabilitation in Western medical hospital (24.4%, 95%CI,

Satisfaction with treatments utilized by the subjects for shoulder stiffness is summarized in Table 6. Amma/massage/shiatsu was the highest in percentage of the subjects who satisfied with the therapy for shoulder stiffness (73.9%, 95%CI, 65.1-81.6%). Acupuncture and/or moxibustion was the second highest (73.4%, 95%CI, 60.9-83.7%), which was followed by osteopathy/chiropractic (68.5%, 95%CI, 56.6-78.9).

The most utilized treatment by the subjects for knee pain was medication or injection in hospital (55.0%, 95%CI, 47.6-62.2%), which was followed by rehabilitation in hospital (30.9%, 95%CI, 24.4-38.0%) and osteopathy/chiropractic and acupuncture and/or moxibustion (14.1%, 95%CI, 9.5-19.9%).

In contrast to the relatively smaller utilization, satisfaction with acupuncture for knee pain was the highest among therapies used for knee pain (85.1%, 95%CI, 66.3-95.8%), followed by kampo prescribed by physician (80.0%, 95%CI, 28.4-99.5%) and osteopathy and chiropractic (77.8%, 95%CI, 57.7-91.4%) (Table 8).

4. Discussion

Our present data showed that the utilization of acupuncture and/or moxibustion in Japanese population in 2007 appeared to be slightly decreased from those in the previous years¹⁾. However, according to the similar statistics based on the research in 2012, the utilization within a year seemed to be increased again⁷⁾. When compared with the other countries, the percentage is still higher than those in the U.S.⁸⁾ and in Austraria⁹⁾,

while similar¹⁰) or higher utilization is reported in some countries in Europe¹¹). In contrast, lifetime experience of acupuncture and/or moxibustion of our subjects still remained at more than 20%, which was considered as relatively high percentage.

Although acupuncture and moxibustion is one of the popular traditional medicines in Japan, satisfaction of the patients who used the remedy is still unclear. Satisfaction with the treatment may vary between countries and regions, according to sociodemographic factors and pathological condition for which acupuncture and moxibustion were sought by the patients. It is therefore useful to investigate utilization and satisfaction with the treatment by countries/regions and specific condition of the patients.

According to our previous nation-wide survey research, the most common condition for which acupuncture and/or moxibustion was utilized was musculoskeletal problems and low back pain was the most frequent condition among the problem, followed by shoulder stiffness and knee pain¹).

The effect of acupuncture and moxibustion on the musculoskeletal disorders such as low back pain, shoulder stiffness and knee pain were assessed in several studies and some of them proven beneficial effects of acupuncture¹²⁻¹⁴).

Results of a study in the United States indicated that 41.2% of the LBP population used CAM in the previous year of the 2012 National Health Interview Survey and acupuncture was utilized by 2.4% of the population²). According to the study, more than 80% of the subject who utilized acupuncture for low back pain felt some or more benefit. The study provided encouraging result regarding benefit of acupuncture for low back pain in an actual society setting.

However, because health care service environment varies between countries and the local government, statistics of the individual country/region may provide different information. In addition, similar statistics of the other popular conditions such as shoulder stiffness and knee pain remain unclear.

In the present study, of 450 subjects who had sought any kind of healthcare for low back pain, 172 (38.2%, 95%CI, 33.7-42.9%) had visited hospital and been prescribed some kind of medication or injection by physician. Although acupuncture and/or moxibustion was the fourth highest (23.3%, 95%CI, 19.5-27.5%) chosen modality by the subjects, satisfaction rate with the treatment was the highest among the healthcare options (77/105, 73.3%, 95%CI, 63.8-81.5%).

Also, satisfaction rate with acupuncture and/or moxibustion treatment was the second highest among the options for shoulder stiffness (47/64, 73.4%, 95%CI, 60.9-83.7%) and those for knee pain was the highest (23/27, 85.1%, 95%CI, 66.3-95.8%). These results suggest that most of the subjects who used acupuncture had found some beneficial effect of the therapy for the musculoskeletal disorders in an actual situation. In fact, results of an RCT study indicates that acupuncture have better effects for low back pain when compared with conventional medicine¹⁵). A systematic review which involved 27 studies on the effect of acupuncture for neck disorders¹³) suggests that acupuncture provides shortterm relief in the symptom. However, whether the neck condition included in the review article are comparable with the "shoulder stiffness" in the present study because the condition is not clearly defined although it is commonly used expression for the stiffed neck muscles among Japanese population. Sufficient satisfaction rate by the subjects who utilized acupuncture and/or moxibustion for knee pain in the present study was also encouraging because the effect of acupuncture for chronic knee pain is still controversial^{16,17}).

Although the result of the present study provides encouraging statistics regarding satisfaction of the patients who utilized acupuncture for popular musculoskeletal conditions in an actual situation, readers should take

account of limitation to interpret the results of the present study: 1) Classification of the condition according to severity of each condition or appropriate diagnosis is unknown and we could not take those account in the analysis. Because patients with severer condition may likely to visit orthopedists than the other health care providers, difference in the severity of conditions between the subjects who utilized different treatment modality may have influenced the satisfaction. 2) Some of the subjects experienced more than one healthcare service and some did not. This violates independency of the satisfaction rate between options and make direct comparison difficult. 3) Numbers of the subjects in each treatment modality were insufficient to maintain sufficient power of the statistical inference and to interpret the results.

Further study is necessary to improve these limitations with a setting that the sufficient number of subjects who are properly diagnosed by physician are eligible and randomly allocated to one of these options.

Our present study suggest that acupuncture and/or moxibustion may have beneficial effect as a treatment modality for common musculoskeletal disorders in terms of overall satisfaction of the patients.

5. Conclusions

1. We investigated selection of treatment modality by patients who were suffered from musculoskeletal problems such as low back pain, shoulder stiffness or knee pain, as well as satisfaction with the treatment.
2. The most frequently utilized treatment by the subjects with low back pain, shoulder stiffness and knee pain was medication or injection in hospital (172/450, 38.2%), amma/massage/shiatsu (119/259, 45.9%) and medication or injection in hospital (105/191, 55.0%), respectively.
3. Proportion of the patients who satisfied with acupuncture for low back pain [77/105, 73.3%] and knee pain [23/27, 85.1%] was the highest and that for shoulder stiffness was the second highest [47/64, 73.4%] among those with the treatment modalities utilized for these conditions.

References

- Ishizaki N, Yano T, Kawakita K, "Public Status and Prevalence of Acupuncture in Japan." *eCAM* 2010, 7(4):493-500.
- Ghildayal N, Johnson PJ, Evans RL, Kreitzer MJ. "Complementary and Alternative Medicine Use in the US Adult Low Back Pain Population." *Glob Adv Health Med.* 2016, 5(1):69-78.
- Sherman KJ, Cherkin DC, Connelly MT, Erro J, Savetsky JB, Davis RB, Eisenberg DM. "Complementary and Alternative Medical therapies for chronic low back pain: what treatments are patients willing to try?" *BMC Complement Altern Med.* 2004, 4:9.
- Yano T, Ishizaki N, Kawakita K, Tanzawa S. "What is required for acupuncture and moxibustion community in order to make the nation to utilize the treatment (6) recognition of acupuncture and moxibustion (in Japanese)." *Ido no nippon* 2006, 751:129-133.
- "Public Interest Incorporated Foundation for Training and Licensure Examination in AmmaMassage-Acupressure, Acupuncture and Moxibustion." <http://www.ahaki.or.jp/>
- R Core Team. R, "A language and environment for statistical computing." R Foundation for Statistical Computing, Vienna, Austria, 2018. URL <https://www.R-project.org/>.
- Yano T, Nabeta T, Yasuno F, Ishizaki N, Fujii R. "Utilizaion of Acupuncture and Moxibustion in Japan: has the utilization rate been increased in the last 10 years?" (in Japanese), *Ido-no-Nippon*, 2013, 72(11):202-13.
- Daw MU, Bethany WR. "A Sociobehavioral Wellness Model of Acupuncture Use in the United States 2007." *J Altern Complement Med*, 2014, 20(1):32-9.
- Maclennan AH, Myers SP, Taylor AW. "The continuing use of complementary and alternative medicine in South Australia: costs and beliefs in 2004." *Med J Aust*, 2006, 184(1):27-3.

- Klein SD, Torchetti L, Frei-Erb M, Wolf U. "Usage of complementary Medicine in Switzerland: Results of the Swiss health Survey 2012 and Development Since 2007." *PROS ONE*, October 29, 2015. DOI:10.1371/journal.pone.0141985
- Frass, M, Strassl RP, Friehs H, Müllner M, Kundi M, Kaye AD. "Use and acceptance of complementary and Alternative Medicine among the general population and medical personnel: A systematic review." *Ochsner Journal*, 2012, 12(1):45-56.
- Liu L, Skinner M, McDonough S, Mabire L, Baxter GD. "Acupuncture for low back pain: An overview of Systematic Reviews." *eCAM*, 2015. <http://dx.doi.org/10.1155/328196>.
- Trinh K, Graham N, Irnich D, Cameron ID, Forget M. "Acupuncture for neck disorders." *Cochrane Database of Systematic Reviews*, 2016, Issue 5. Art. No.: CD004870. DOI: 10.1002/14651858.CD004870.pub4.
- Li A, Wei ZJ, Liu Y, Li B, Guo X, Feng SQ. "Moxibustion Treatment for Knee Osteoarthritis." A systematic review and Meta-Analysis. *Medicine*, 2016, 95(14):1-9.
- [Inoue M, Hojo T, Nakajima M, Kitakoji H, Itoi M. "Comparison of the effectiveness of acupuncture treatment and local anaesthetic injection for low back pain: a randomized controlled trial." *Acupunct Med*, 2009, 27:174-7.
- Hinman RS, McCrory P, Pirotta M, Relf I, Forbes A, Crossley KM et al. "Acupuncture for chronic knee pain: a randomized clinical trial." *JAMA* 2014, 312:1313-22.
- Sun N, Shi GX, Tu JF, Li YT, Zhang LW, Cao Y et al. "Traditional Chinese acupuncture versus minimal acupuncture for mild-to-moderate knee osteoarthritis: a protocol for a randomised, controlled pilot trial." *BMJ Open* 2016, 6(12):e013830.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal. This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).