



## Research paper

# Implementing evidence into clinical practice. A survey amongst Norwegian acupuncturists

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## ABSTRACT

**Introduction:** As the knowledge base evolves in research and clinical application, the demands for adaptability and development in the acupuncture community increase. This study investigates whether acupuncturists in Norway implement changes in their practice according to the developments in research, and which sources of information they use to inform their practice.

**Methods:** Between June and September 2021, Norwegian Acupuncture Association (NAA) members received a link to an online survey collecting demographics, education, years in practice, patients per week, continuing education, and implementation of evidence into clinical practice. The sampling strategy was self-selection. Data was analysed using Microsoft Excel, reported as means, numbers, and percentages. A qualitative descriptive approach was used to analyse, code and categorise data for the open-ended question.

**Results:** Two hundred and four registered Norwegian acupuncturists responded. Nearly two thirds reported that they do not have the time for continuing professional development. Thirty-nine percent responded that an evidence-based acupuncture practice provides the best treatment for patients, and 51% believed that in some cases evidence-based practice provided the best treatment for patients. Ten percent were unsure if evidence-based acupuncture practice provided the best treatment.

**Conclusion:** Acupuncture does not appear to differ from other medical disciplines with regards to barriers to continuing education and professional development. Despite not working full-time, Norwegian acupuncturists reported lack of time as a barrier to continuing professional development. Barriers to improvement of acupuncture clinical practice were also reported and the onus was on the NAA to implement evidence-based knowledge and likewise update strategies.

## 1. Introduction

Acupuncturists in Norway treat several thousand patients every year and provide a significant contribution to health care as a non-pharmacological treatment with few side-effects [1,2]. As the knowledge base evolves in acupuncture research and clinical application, the demand for adaptability and development in the professional acupuncture community and clinical practice increase. The Framework Requirements for Acupuncturists and Professional Ethics [1] requires all members of the Norwegian Acupuncture Association (NAA) to meet quality assurance criteria for competence and continue to develop and

enhance their skills in clinical practice. It is crucial that acupuncturists adapt to this professionalisation, development, and knowledge expansion, in order to continue strengthening and securing the profession. Lagging behind will weaken both acupuncture practice and the professional organisations.

In the last twenty years acupuncture research has expanded more than four times with 13,320 publications by 2014 and continuing growing with an annual growth rate of 10.7% [2]. This is double the 4.5% annual growth rate of research in biomedicine [2]. A large number of systematic reviews, meta-analyses, and individual patient data (regarded the highest strength of evidence), have been published in

**Abbreviations:** NAA, Norwegian Acupuncture Association; TCM, Traditional Chinese Medicine.

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recent years [2]. Evidence from acupuncture research plays a fundamental role in enhancing the reliability of acupuncture, which is still debated in the medical community [2]. Although, acupuncture is an evidence-based medicine that is clinically effective, cost-effective and included in 2189 clinical practice guidelines, it has not yet received the recognition of or incorporation into mainstream healthcare [3,4].

Literature suggests that there are considerable difficulties getting health research and evidence translated into clinical practice [5,6]. The average time lag between health research evidence and change in clinical practice is 17 years. To our knowledge, comparable studies on translational and implementation science have not yet been performed on acupuncture research; however, previous studies have found a certain level of resistance and reservations about research amongst the acupuncture community, in addition to the low use of evidence-based knowledge in clinical decision-making [7,8].

This survey aimed to explore the sources of information utilised by acupuncturists in Norway to inform their practice and explore whether acupuncturists are implementing any changes in their practice in accordance with research conducted over the last ten years.

## 2. Methods

### 2.1. Survey design

The methodology used in this study was a survey consisting of an online self-administered questionnaire that measured professional and clinical development in the acupuncture profession in Norway. This is the most widely used method to collect data from a target group of people [9].

### 2.2. Aim

The primary aim of the questionnaire survey was to collect information and to gain an understanding about professional and clinical development in the acupuncture profession in Norway in order to aid the academic committee to build a strategy for professional development.

### 2.3. Survey

The online survey was developed and hosted on Microsoft Forms. The content of the survey was developed by the academic committee of the Norwegian Acupuncture Association (NAA) with support from Professor Terje Alræk, Kristiania University College. The questionnaire survey consisted of open and closed-ended questions. The survey was not piloted. The questions covered the practitioner demographics and education, number of years in practice, number of patients per week, sources of information (e.g., seminars and webinars), and implementing of evidence from research into clinical practice.

### 2.4. Recruitment

Invitations to participate in the survey were distributed via email and social media between June 28 and September 1, 2021, via the NAA. Two reminders were posted on a closed professional group on social media. Due to summer vacation amongst the staff one reminder was emailed to 417 members by the NAA. Self-selection sampling of the members of NAA was the sampling strategy used. Participant information was included in the introduction of the survey and completing the survey was a statement of consent.

### 2.5. Participants

The inclusion criterion for participation was a member of the NAA. The majority of the NAA members are Traditional Chinese Medicine (TCM) practitioners with a bachelor's degree in acupuncture including biomedicine such as anatomy, physiology, and pathology, a few are

health professionals such as medical doctors, nurses and physiotherapists with 2500 h acupuncture training. The survey was anonymous and there was no direct contact between the researchers and the respondents. As a survey, no calculation was done regarding the numbers of respondents needed.

### 2.6. Data analysis

Data was analysed using Microsoft Excel. Descriptive statistics were reported as means, numbers, and percentages. For the open-ended question relating to measures that can increase the chances for updating acupuncture knowledge, a qualitative descriptive approach was used to analyse and code the data [10]. Initial meaning units were condensed into codes by one researcher (MLD). Codes with similar patterns were grouped into categories. This process and the subsequent categorization were further discussed with the academic committee.

### 2.7. Ethics

According to Norwegian legislation no ethics approval was required for this survey as the data was collected anonymously. By responding to the survey, respondents agreed to participate.

## 3. Results

### 3.1. Participants

Table 1 outlines the demographics of respondents. Two hundred and four registered Norwegian practitioners responded to the survey. All surveys were completed in full. This is a response rate of approximately 50%. The majority of the respondents were female (76.5%) and aged

**Table 1**  
Demographic of responders.

Characteristics	n = 204	%
Gender		
Female	156	76.5
Male	48	23.5
Age		
20–25 years	1	0.49
25–35 years	15	7.35
36–45 years	39	19.12
46–55 years	58	28.43
55–65 years	72	35.29
65+	19	9.31
Level of TCM education		
Diploma	74	36.27
Bachelor-degree	93	46.59
Diploma + Bachelor-module	32	15.69
Masters-degree	3	1.47
PhD	2	0.98
Years in acupuncture practice		
0–5 years	22	11.00
6–10 years	42	20.50
11–15 years	42	20.50
16–20 years	40	19.00
21–25 years	24	12.00
25+ years	34	17.00
Acupuncture patient seen/week		
0–15	72	35.0
16–35	67	33
36–50	30	15.0
51–80	14	7.0
81–100	3	1.5
>100	1	0.5
Currently not in practice	17	8.0
In my clinical practice, I work:		
With other health professionals	89	44.0
Alone	72	35.0
With other acupuncturists	28	14.0
Currently not in practice	15	7.0

between 5565 years-old (35.29%). Most practitioners held a bachelor's degree/level (62.28%), with six to 15 years of clinical experience (41.0%). With regards to practice, 44.0% of respondents worked together with other health professionals and 35.0% worked alone. The two largest groups saw 0–15 patients per week (35.0%) or 16–35 patients per week (33.0%), which indicates that for most acupuncturists this is not a full-time job.

### 3.2. Updating knowledge

Table 2 reports the frequency and time spent on updating knowledge via peer-reviewed journals, research articles and courses/seminars. Over half of the responders (54.0%) reported spending 0 to 5 hours a month on updating their professional knowledge. There were 58% of respondents who reported that they did not have the time to update their acupuncture skills and knowledge due to family circumstances, economy or other reasons not defined. During the last 1-3 years, 35.0% of respondents had attended a course/seminar and 10% of the respondents had not attended any courses since finishing the basic acupuncture training.

On the question: If you have not taken courses in the last two years, what is the reason? There were 30.26% responded that responded they have not found/did not know about online courses, 28.95% responded

**Table 2**  
Update of knowledge.

Frequency	n =	% of those answering
	204	the question
<b>How often do you update your knowledge by reading peer-reviewed journals?</b>		
Daily	9	4.0
Weekly	49	24.0
Monthly	100	49.0
Every 6 months	40	20.0
Once a year	4	2.0
Never	2	1.0
<b>Update of knowledge by reading research articles on acupuncture.</b>		
Daily	2	0.98
Weekly	30	14.71
Monthly	86	42.16
Every 6 months	54	26.47
Once a year	23	11.27
Never	9	4.00
<b>Update of knowledge by attending seminars/courses.</b>		
Attended courses several times last year	22	11.0
Attended courses at least once last year	34	17.0
Have attended a course during the last 1–3 years	71	35.0
Have attended a course during the last 4–6 years	56	27.0
Not attended any courses since finishing the basic acupuncture training	21	10.0
<b>If you have not taken courses in the last two years, what is the reason? (n = 152)*</b>		
Too expensive	29	19.08
Not available courses	44	28.95
Not found / known about online course	46	30.26
No interesting courses online	33	21.71
* Out of potential 204 responders, 152 (ca. 75%) responded to this question (n = 152)		
<b>How many hours per month do you spend on updating your professional knowledge?</b>		
0–5	110	54.0
6–10	66	32.0
11–15	16	8.0
16–20	8	4.0
More than 20 h/month	4	2.0
<b>At the moment I do not have time to update my acupuncture knowledge due to: (n = 118)*</b>		
Just started in practice	2	1.69
Family conditions	19	16.10
Economic conditions	16	13.56
Other	81	68.64

\* Not all respondents answered this question

that there were no available courses, 21.71% responded that there were no interesting online courses and 19.08% responded that taking courses is too expensive.

### 3.3. Evidence-based clinical practice

The majority of the Norwegian practitioners reported the use of the journal DeQi (79.0%) and/or fact sheets (68.0%), both published by the NAA as a source of information on research and advice/guideline on acupuncture. Nearly half of the respondents (46.0%) used PubMed, Medline and/or Cochrane as their source of information on research and advice/guideline on acupuncture.

Forty percent of Norwegian acupuncturists implemented to a large extent new knowledge presented in research articles to their clinical practice, 14.5% to a very large extent and 38.0% to some extent. Thirty-nine percent indicated that evidence-based acupuncture practice provides the best treatment for patients, and 50.5% reported that in some cases evidence-based acupuncture practice provides the best treatment for patients. Ten percent did not know if evidence-based acupuncture practice provides the best treatment for patients.

On the question: *If you get a patient with a problem you have not previously treated and lack knowledge, where do you seek information?* Respondents provided multiple answers. 82.0% responded that they would diagnose and treat on the basis of their TCM theory knowledge. Nearly half of the practitioners (47.5%) would refer the patient to a colleague with experience for this type of problem and 40.0% would search PubMed for relevant publications Table 3 reports on source of information and implementing new knowledge into clinical practice.

### 3.4. Measures to enhance the chances of updating knowledge

The last question, investigating measures to enhance the chances of practitioners updating their acupuncture knowledge, was an open-ended question with a free text box provided for responses. More than half of the respondents proposed seminars and workshops either on location or online arranged by the NAA as important strategies to update knowledge. Mandatory courses and an annual research day were also suggested. Ten per cent of respondents proposed more activity in the districts including courses and peer guidance. Other approaches such as practical clinical courses, mentorship programs and organised discussion groups were also suggested. One respondent brought up the need for guidance on where to locate information on acupuncture research.

To improve updating of acupuncture knowledge, there were various suggestions which ranged from suggestions to establish an acupuncture research database managed by the NAA, presentation of research news on the association website and in the association's Facebook group page, newsletters and emails sharing links to new studies and research articles in the journal DeQi. Two respondents (0.98%) recommended podcast and YouTube lectures as the course of action for updating knowledge. Lack of time, finances, and priorities were barriers that prevented acupuncturists from updating professional knowledge.

## 4. Discussion

This is the first study to measure the implementation of evidence in Norwegian acupuncture practices. This study found that despite not working full-time, nearly two third of the respondents reported the lack of time for continuing professional development. Other reasons for not updating professional competence and knowledge were family circumstances, economy, or other undefined reasons. Norwegian acupuncturists reported that there were barriers to improvement of acupuncture clinical practice and laid the onus on the NAA to implement knowledge updating strategies.

**Table 3**  
Evidence based clinical practice.

Characteristics	n =	%
<b>Where do you find up-to-date information on research and guidelines on acupuncture? Multiple answers are possible.</b>		
DeQi	162	79.0
NAA fact sheet	138	68.0
Journal of Chinese Medicine (JCM)	106	52.0
PubMed/MedLine/Cochrane	94	46.0
Evidence Based Acupuncture (EBA)	56	27.0
The British Acupuncture Council (BAcC)	54	26.0
WHO	39	19.0
Helsebiblioteket	38	19.0
ETCMA	29	14.0
Society for Acupuncture Research (SAR)	19	9.0
WFAS	10	5.0
Other	59	29.0
<b>If you get a patient with a problem you have not previously treated and lack knowledge, where do you seek information? Multiple answers are possible.</b>		
Use knowledge from TCM theory, diagnose and treat on the base of this	168	82.0
Refer the patient to a colleague with experience from this type of problem	97	47.5
Search PubMed for relevant studies	81	40.0
Ask colleagues in colloquium group	65	32.0
Ask colleagues in the Norwegian Acupuncture Association's Facebook group	63	31.0
Ask colleagues in international Facebook groups	18	9.0
<b>If new knowledge is presented in research articles, to what extent do you implement this in your clinical practice?</b>		
To a very large extent	30	14.5
To a large extent	81	40.0
To some extent	77	38.0
To a small degree	15	7.0
Never	1	0.5
<b>To what extent do you change and adapt to new knowledge base in our profession and in clinical practice?</b>		
To a very large extent	31	15.0
To a large extent	71	35.0
To some extent	89	44.0
To a small degree	12	6.0
Never	1	0.5
<b>I think that an evidence-based acupuncture practice provides the best treatment for patients.</b>		
Yes	80	39.0
No.	1	0.5
In some cases	103	50.5
Do not know	20	10.0
<b>I use evidence-based theory / medicine or information from systematic review articles to improve my clinical practice</b>		
To a very large extent	14	7.0
To a large extent	50	24.5
To some extent	115	56.0
To a small degree	22	11.0
Never	3	1.5
<b>I discuss and share evidence-based methods or systematic reviews with other acupuncturists to improve clinical practice at my clinic.</b>		
To a very large extent	6	3.0
To a large extent	29	14.0
To some extent	74	36.0
To a small degree	81	40.0
Never	14	7.0
<b>I change practice based on data / results I collect from patients</b>		
To a very large extent	15	7.0
To a large extent	75	37.0
To some extent	86	42.0
To a small degree	24	12.0
Never	4	2.0

#### 4.1. Barriers to improvement to acupuncture clinical practice

The identified barriers to improving acupuncture clinical practice are in concurrence with research in other health professions, where practitioners strive to attain or maintain competences and skills to provide the best quality of service to their patients [11]. Lack of

self-motivation and time, family commitments, financial constraints, and distance to study events are common barriers mentioned both in Europe, Africa and Asia in several health professions, and may be caused by a lack of understanding of the importance of participating in continuing education [11–13]. In his 1995 article *Great Talents Ripen Late: Continuing Education in the Acupuncture Profession*, the late Hugh MacPherson pointed out that the focus in the acupuncture profession had been ensuring minimum standards of basic training and competence in order to gain access to the profession [14]. However, that phase represents a relatively short time-period in a practitioner's working life [14]. Furthermore, evidence shows that undergraduate education and training is inadequate in a professional work-life context, as knowledge has a half-life of approximately five years, after which it declines [13]. This indicates that continuing education and updating of knowledge and skills is required [13]. Focus on professionalism, defined by principles and professional responsibilities, such as compliance to values, commitment to professional competence and responsibilities, improving quality of care, having scientific knowledge and personal awareness and motivation is necessary in the future development of the profession. The Chinese Medical Doctor Declaration defines professionalism as such: "primacy of patients, honesty and fidelity to promises, commitment to excellence and prudence and lifelong learning." [15]. Acupuncturists that serve the needs and best interest of the patients thus have a responsibility to continue to learn and develop in order to maintain the quality and safety of their treatments [14]. This requires self-regulated learning where personal initiative, determination and resilience are key [16].

This survey found that during the last 1-3 years 35.0% of the practitioners have attended a course/seminar. Another concern was that 10.0% have not attended any courses since finishing the basic acupuncture training. Furthermore, a surprisingly high number of practitioners reported that they did not find nor did not know about online courses (30.26%), that there were no available courses (28.95%) or that there were no interesting online courses (21.71%). These findings are in concurrence to barriers mentioned in the literature [11–13]. The impact from the Covid-19 pandemic in the ability to travel and meet physically at courses and conferences resulted in a growing number of courses and conferences offered online. This cornucopia of web-based knowledge is shared often for free or at an affordable price. Therefore, this can somewhat contribute to overcoming barriers such as distance to the event, irrelevant topics, and lack of awareness of about learning opportunities available to the practitioners [11–13].

#### 4.2. Measures increasing the chances of updating the acupuncture knowledge

This study found that the major source of knowledge is the journal *DeQi* (79.0%) and/or fact sheets (68.0%) both published by the Norwegian Acupuncture Association. Although, 62.28% had a bachelor's degree where academic skills such as critical thinking, reflective practice, analysis, communication, and time management of own learning are part of the curriculum, the majority of respondents placed the responsibility for gathering relevant research literature and distributing the information on the NAA. Such responsibility would require resources and competent staff to implement this on a routine basis. One suggested way to overcome this barrier is to educate the practitioners about their own responsibility towards continuing professional development and creating web-based mandatory learning opportunities focusing on mastering skills such as searching, reading, and critically analysing research papers. Another measure could be the mandatory requirement of continuous education hours or credits every year/every four years that could be initiated for the members of the NAA.

#### 4.3. Standing still or moving forward - dare to change practice

In this survey, only 39.0% of the practitioners considered that an

evidence-based acupuncture practice provided the best treatment for patients. The majority (61.0%) of respondents did not consider that evidence-based acupuncture practice provided the best treatment for patients and could hold back professional development, which is concerning. The results suggest acupuncturists in Norway have chosen another strategy for their practice that the individual is satisfied with, but at group level, it is likely that acupuncture in Norway would be more prominent in the healthcare system if evidence-based acupuncture had become the hallmark and not TCM acupuncture as it is today. Relating the results of this survey to the 20-years of work by the NAA for the authorisation of acupuncturists as a health profession, this gap may be a reason of the lack of desired recognition of the profession in Norway. Additionally, the survey displays that an update of knowledge and professional development is needed in a large group of Norwegian acupuncturists to increase the use of evidence-based knowledge in clinical decision-making [7,8]. Bridging the gap between research results and clinical practice may be the most important focus for the next following years as acupuncture has not yet received the recognition into mainstream healthcare in Norway. Strategies to overcome barriers to implementing research discoveries into clinical practice and communicating this to practitioners that are reluctant or lack knowledge on evidence-based acupuncture practice is crucial. Although training in evidence-based acupuncture practice skills is now a part of the syllabus of the bachelor's degree at Kristiania University College in Norway, many qualified practitioners still lack the expertise required. It is essential for practitioners to gain knowledge and skills in evidence-based acupuncture practice and to continue to take ownership of their practices and continuous learning after their basic training [17]. "It is a fundamental skill to be able to identify and appraise the best available evidence in order to integrate it with your own clinical experience and patients' values." [18]. This is especially important and relevant in cases where a practitioner has not previously treated and lacks the knowledge on a patient's problem. In our survey, the majority (82.0%) of acupuncturists responded that they would diagnose and treat on the base of TCM theory knowledge without searching for relevant publications on the topic. This could have been a great learning opportunity and an initiative to further develop clinical practice.

The present study is the first to objectively assess knowledge about continuing education and implication of research results into clinical practice amongst Norwegian acupuncturists, who are members of NAA. Our data is representative of a broad range of views of TCM practitioners in Norway. Collecting information using cross-sectional surveys can be a relatively quick and inexpensive way to reach a large sample of the population, however the response rates are often low and susceptible to biases such as non-response bias [19,20].

The study contains some limitations which may have impacted on the results, and thereby compromise the generalisability. Surveys are susceptible to selection bias [20]. Using an online survey may have excluded NAA members that are non-familiar with the use of internet and web-based surveys leading to under-representation bias. The recruitment of respondents in this survey was based on self-selection. Self-selection bias can occur as respondents who are more interested in updating knowledge, continuing education and research are more likely to fill in the survey. However, our results do not reflect that.

## 5. Conclusion

This is the first study to measure the implementation of evidence in Norwegian acupuncture practices. Norwegian acupuncturists do not appear to differ from other medical practitioners with regards to barriers for continuing education and professional development. Our study shows that, despite the investment that has been made for Norwegian acupuncturists with regard to evidence-based acupuncture treatment, still the care being delivered is not based on evidence from research. Is there still a gap between clinical experience and research, and how the latter is utilized? Despite not working full-time, the majority of

Norwegian acupuncturists reported lack of time as a barrier for continuing professional development. Norwegian acupuncturists reported that there were barriers to improvement of acupuncture clinical practice and laid the onus on the NAA to implement knowledge updating strategies. The persistent work of NAA for the authorisation of acupuncturists as a health profession requires that practitioners are updated on both their own field and the medical-health professions and practices they are collaborating with.

## Author contributions

**Merete Lindén Dahle:** Conceptualization, Methodology, Project administration, Writing – original draft. **Terje Alraek:** Conceptualization, Supervision, Writing – review & editing.

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## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Data availability

Research data is available upon request. To request the data, contact the corresponding author of the article.

## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.eujim.2023.102234.

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