Interest and experience in the role of acupuncture in in-vitro fertilisation.

Independent Learning Project Final Report

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Abstract

Background

Objectives

(1) To examine the extent of use of CM in subjects at an infertility clinic.
(2) To observe the perspectives and beliefs held by subjects on the use of acupuncture in the setting of IVF.

Design

The study utilises a structured survey in the form of self-completion questionnaires. Sample size of 89 patients from a fertility clinic in Sydney, Australia.

Results

80% of patients had used some form of CM in managing their infertility, of which 64% had used vitamins or minerals, 37% had used acupuncture, 25% had used Chinese herbs, 19% had used naturopathic therapies, 9% used remedial massage, 4% used chiropractic therapy, and 4% had used homeopathy. A large representation (45%) of subjects agreed that acupuncture aids IVF success rates by way of stress reduction, and a similar proportion (44%) thought that it helped with relaxation. 45% of subjects reported past acupuncture use, and 67.5% indicated that it was used in conjunction with IVF. 37.5% had used it for other purposes. Acupuncture users predominantly (85%) agreed that their reason for use was that they were willing to try anything to help their condition. Subjects who had never used acupuncture before mostly (65%) gave the reason that they had never thought about trying it before. Most non-acupuncture user subjects (76%) indicated that they would be interested in trying acupuncture if it were recommended by a specialist, but less so if by a GP (51%) or family/friend (37%).

Conclusion

IVF patients view acupuncture as a possible means of stress reduction and relaxation during the IVF treatment process, which raises the concern that the process of IVF is a contributing source of patient perceived stress, and the possibility that acupuncture addresses patient health and well-being in a way that current conventional medical practice does not. Socio-demographic analysis also showed that a willingness or desperation to try CMs such as acupuncture to improve chances of conception, was correlated with increasing length of infertility and number of treatment cycles. This motivation was also the main motivating factor that led patients to uptake acupuncture treatment. This predominating belief highlights a possible need to challenge how acupuncture's efficacy is measured, as perhaps we need to define it in ways other than quantifiable clinical outcomes may be. The fertility specialists' pivotal role in patients'

interest in the use of acupuncture is also highlighted by this study, and the implications of which are that they should increase in their consciousness of the existence of such modalities and be able to recommend it to patients who may potentially benefit, be it in in quantifiable clinical outcomes, or aiding stress management and sense of well-being.

Contents

Introduction

Since the world's first successful in vitro fertilisation (IVF) pregnancy and birth in 1978, IVF has fast become the treatment of choice in the setting of infertility in reproductive medicine. However, there has been limited success in attempts to increase implantation rates of transferred embryos. Success rates in Australia remaining consistent at around 22% per cycle since 2002 (AIHW, 2009) while this figure is slightly higher at 33% in the United States, but the fact remains that in majority of IVF cycles, transferred embryos do not develop into clinical pregnancies or live births (Anderson et al, 2007).

The profound psychological effects resulting from both infertility and its main form of intervention, IVF, have been demonstrated by studies examining the association between stress and failure to conceive (Nakamura et al, 2008, de Lacey et al, 2009). Women who have difficulty conceiving and are undergoing IVF treatment have to confront both the chronic stress of the possibility of definitive infertility and potentially never having children, and the confront the acute stress associated with IVF treatment itself (de Lacey et al, 2009). This includes stress derived from the invasive nature of IVF, the physical toll of repeated IVF cycles due to low success rates, and high financial costs of IVF with each cycle costing at least A$6500 (IVF Australia, 2010). The culmination of these stressors may hence perpetuate a vicious cycle as the physiological effects of stress may adversely affect their chance of successful conception. As a result, IVF patients are increasingly turning to alternative and complementary therapies in adjunct to IVF, in hope of increasing their chance of conceiving.

Alternative and complementary therapies

Alternative and complementary therapies encompass a range of interventions including vitamins, supplements, homeopathy, naturopathy, chiropractics and

traditional Chinese medicine (TCM). The increasingly widespread use of alternative and complementary medicine in Australia is reflected in a South Australian study in 2004, where an estimated 58% of women and 46% of men used such therapies in the preceding year (AIHW, 2006). In the setting of reproductive medicine, a prospective survey conducted in a South Australian infertility clinic found that 66% of subjects used complementary medicines, with the most commonly used types include multivitamins, herbs, mineral supplements, and most frequented alternative practitioners included naturopaths, chiropractors, and acupuncturists (Stankiewiecz et al, 2007).

However, not all of these alternative and complementary therapies have been subject to evidence-based trials to determine their safety and efficacy. The escalating numbers of subfertile couples that turn to these adjunct therapies while undergoing conventional medical interventions, have hence provided impetus for such studies to be conducted. In particular, the popularity of acupuncture amongst IVF patients has thrived.

Acupuncture, a form of therapy central to TCM with a history of over 3000 years, has gained renewed interest following recent scientific research on its safety and efficacy, and attempts to elucidate its mechanism of action. It involves the insertion of fine needles into acupoints along meridians that delineate the flow of energy or *Qi* in the body, which according to the principles of TCM, corrects *Qi* imbalances in disease states. Modern practice of acupuncture may involve electric stimulation, moxibustion, ear acupuncture and lasers. To date, acupuncture has been shown to mitigate nausea, vomiting, and various types of pain (NIH Consensus Development Panel of Acupuncture, 1998; Streitberger et al, 2004).

The rising popularity of acupuncture in countries that are predominated by the practice of Western medicine makes Australia no exception. A study by Xue *et al.* (2008) has found that approximately one in four adult Australians used acupuncture at least once over a 12-month period, with nearly a fifth of users having been referred to

manipulative therapy (including chiropractic and osteopathy) by medical practitioners. More than 90% of subject considered their therapy to be helpful to their medical conditions, the most common of which was back pain. It is however not without its fair share of risks, although reportedly minor and rare in occurrence; common adverse events associated with acupuncture include pain after needling, tiredness and bruising at needling sites (Xue et al, 2008).

As a result of renewed interest in therapies such as acupuncture, new bodies of evidence have been surfacing in the area of acupuncture use as an adjunct to IVF treatment. However, a review of the current literature, specifically a critical appraisal of nine different studies (de Lacey et al, 2009; Dieterle et al, 2006; Domar et al, 2009; Magarelli et al, 2008; Paulus et al, 2002; Smith et al's, 2006; So et al, 2009; Stankiewicz et al, 2007; Westergaard et al, 2006.) has led to the conclusion that at present, there is insufficient evidence to conclude the proven efficacy of acupuncture in improving success rates of IVF. A study by de Lacey et al (2009) signalled a need to further investigate the perceptions of IVF patients in relation to acupuncture and assess its uptake rate, in order to elucidate patterns of use in correlation to personality types, social demographics, personal beliefs or other variables. This might then lead to further insight into the efficacy of acupuncture and how these socio-psychological factors might interact with outcomes.

Methods

Recruitment

The study involved utilising a structured survey to assess the use of acupuncture amongst IVF patients and investigate their views toward its use.

A structured survey in the form of self-completion questionnaires (Refer to Appendix 1) was conducted at a fertility clinic in Sydney, New South Wales (IVF Australia). Ethics approval for this study was obtained from IVF Australia's Research and Development Ethics Committee. Subjects were recruited in the waiting rooms of IVF Australia. Subject eligibility was defined as follows: if they were female and current infertility patients at IVF Australia. Patients who were presenting for obstetrics-related issues or were presenting to the clinic for their first consultation were excluded.

Survey

Development

The survey was designed to address the main objectives of this study. Questioned generated were a result of examining and reviewing the current literature on the use of acupuncture in the setting of IVF, as well as patients' interest and experience with this specific use of acupuncture therapy.

A self-completion questionnaire was designed to assess the extent of CM and acupuncture use amongst subjects, and further investigate the beliefs held towards acupuncture and how this has influenced their patterns of use. Questions concerning subjects' demographic characteristics and fertility history were included. Potential interest in using acupuncture amongst subjects who had not had any experience using

it was also examined. Questions were deliberately designed to be simple and straightforward to answer, and easily completed within a short period of time to encourage participation. Initial concern over the issue of consent required subjects to include their name and signature on the questionnaire, which led to difficulty recruiting participants. Upon review, this requirement was removed and a clause in the information section was added, stating that completion of the questionnaire indicated subjects' consent. Prior to presenting questionnaires, verbal consent was first acquired by the investigator.

Content

Questions on subjects' demographic characteristics included age and occupation. Fertility history questions enquired the number of children subjects have had, length of infertility, and number of IVF cycles they had gone through. Subjects were asked to indicate CMs they had used in the management of their infertility from a non-exhaustive list of commonly used CMs, with an added option to list names of other non-listed CMs. Listed CMs include vitamins, minerals, homeopathy, naturopathy, remedial massage, chiropractic, Chinese herbs, moxibustion, and acupuncture.

Four final questions targeted the perceptions and beliefs of subjects on the matter of acupuncture use in the setting of IVF. Subjects were asked to select from a list of possible mechanisms by which acupuncture might help them conceive, to indicate what their understanding of how acupuncture might work in aiding infertility. The list included relaxation, stress reduction, improvement of immune system, improvement of hormone balance, improvement of egg quality, and improvement of implantation. An option to provide explanations not listed was also provided.

Subjects were then asked about their experience with using acupuncture. If they had used it before, they were further enquired if it was used in conjunction with IVF treatment. If affirmative, they were asked to indicate reasons for their choice to

use acupuncture with IVF from a list of options, including ‘I believed it would definitely help my condition’, ‘I was willing to try anything to help my condition’, ‘Recommended by family/friends’, ‘Recommended by GP/specialist’, and an option to list other reasons. If the acupuncture was used for a purpose other than in conjunction with IVF, they were asked to specify what it was used for.

Subjects who had never used acupuncture before were asked to indicate reasons for not using it. Listed reasons included ‘Don’t believe it works’, ‘Don’t think it’s worth the extra cost’, ‘Don’t like needles’, ‘Never thought about trying’, ‘Have not heard of it before’, and an option to list other reasons. Lastly, these same subjects who had no experience with the use of acupuncture were asked to indicate their interest in using this form of therapy, in particular if they had been recommended by either a family/friend, GP or specialist.

Results

Response Rate

A total of 94 subjects were approached and gave consent to participating in the study with attempts to complete the questionnaire. Of these, 89 successfully completed the questionnaire to our satisfaction, while the remaining 5 had either insufficient time to complete the questionnaire entirely, had not satisfactorily responded to all relevant questions, or had allowed someone else (for example their male partner) to complete the survey on their behalf at some point without their explicit instruction and input. This gives a response rate of 94.7%.

Demographic Characteristics

The mean age of the 89 subjects surveyed was 35.6 years (SD = 5.276). It was found that a large majority of 88.5% of them were employed, while the remaining 2% and 9% were either students or homemakers respectively. The average number of children subjects had was 0.4 (SD = 5.276), the median and mode value for which were both 0.

Questions eliciting fertility histories revealed that the mean length of infertility was 3 years (SD = 2.664), while the mean number of IVF cycles subjects had undergone was 2 (SD = 3.461). IVF cycles included frozen, fresh and donor cycles. Results of demographic characteristics are summarised in Table 1.

Table 1: Demographic characteristics of subjects

	N = 89 Mean	 SD
Age	35.5618	5.27635
Employment Status (n, %)		
Employed	77	88.506
Student	2	2.299
Home duties	8	9.195
Number of children	0.47191	0.658681
Length of infertility (years)	3.00187	2.6646
Number of IVF cycles	2.47191	3.46111

Use of complementary medicines and therapies

Analysis of results showed that a vast majority of 80% of subjects used at least one or more complementary therapies in the management of their infertility, with the mean number of therapies used being 1.7 (SD = 1.473). (Refer to Table 3.) The most commonly used CM reported amongst subjects were vitamins or minerals at 64%, with acupuncture coming in second highest at 37%, followed by Chinese herbs in third place at 25%. 19% of subjects used naturopathy therapies, 9% reported use of remedial massage, 4% had undergone chiropractic therapy, 4% reported using homeopathy, 3% had used moxibustion, and 3% cited other CMs that were not listed. (Refer to Figure 1.) The three other CMs listed by subjects were: heat therapy, kinesiology (which subject 28 spelt as 'kinseology' in the survey but this was not found to be a recognised word, the closest possible term being kinesiology,) and yoga. These were all considered and included as CMs despite possible controversy over the

last listed CM, as it is possible that the practice of yoga may be considered more than a form of exercise in some belief and cultural systems. (Refer to Table 2 for summary of results.)

Figure 1: Pattern of complementary medicine use

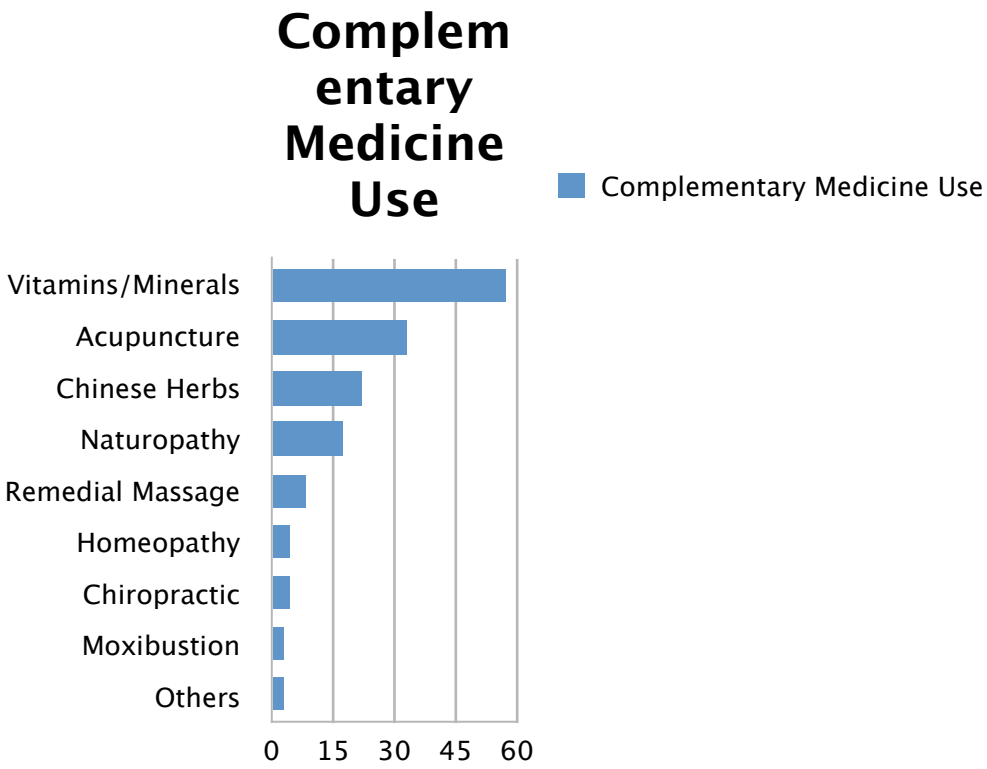


Table 2: Use of complementary therapies in managing infertility

	$N = 89$	
Use of complementary therapy	*n*	%
Vitamins/Minerals	57	64.045
Acupuncture	33	37.079
Chinese Herbs	22	24.719
Naturopathy	17	19.101
Remedial Massage	8	8.989
Chiropractic	4	4.494
Homeopathy	4	4.494

Moxibustion	3	3.371
Others	3	3.3708
Heat therapy		
Kinesiology		
Yoga		

Table 3: Number of complementary medicines used

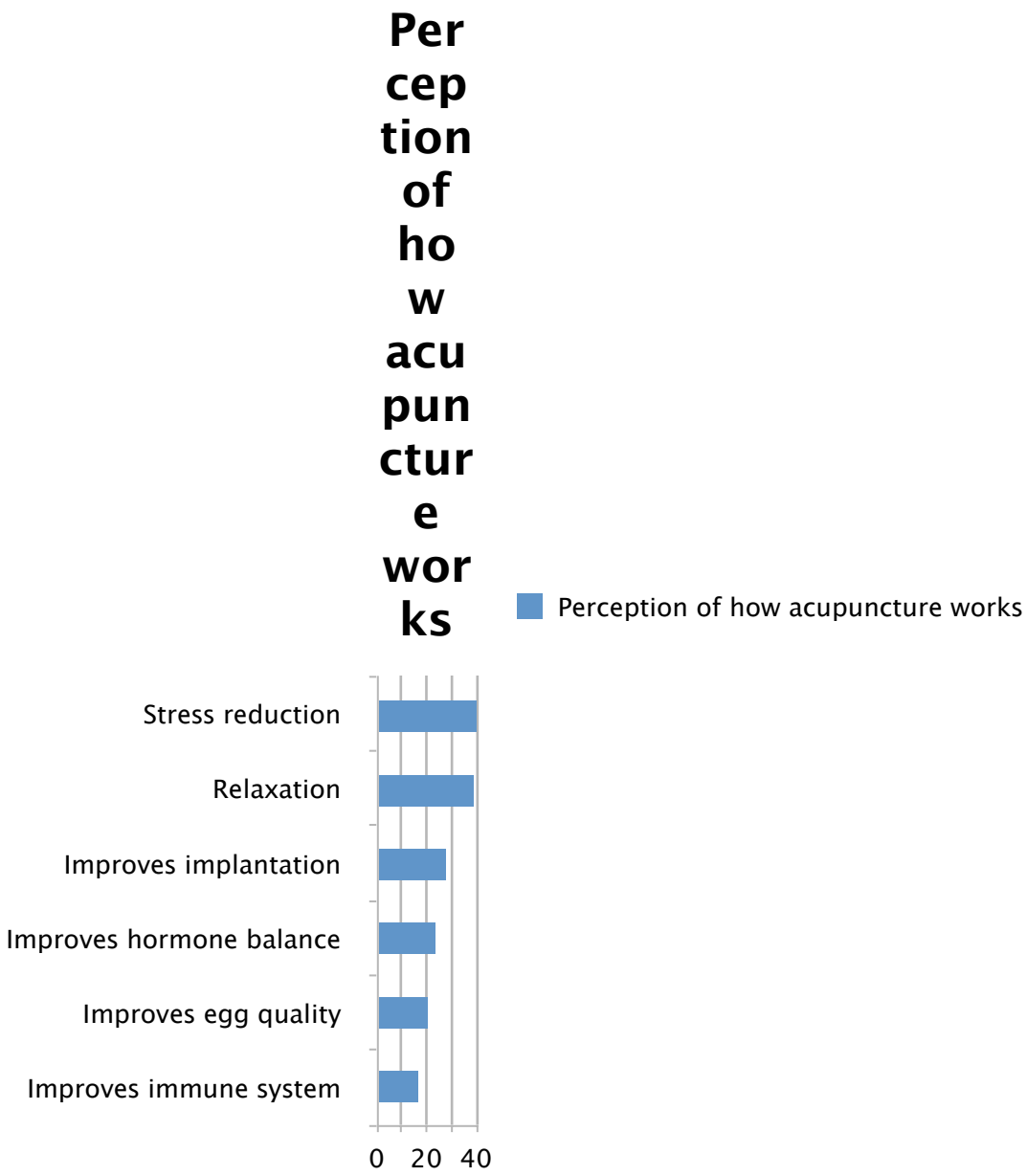
Number of CMs used	*n*	%
Mean, SD	1.697	1.473
0	18	20.225
1 or more	71	79.775
2 or more	38	42.697
3 or more	26	29.213
4 or more	9	10.112
5 or more	5	5.618
6 or more	1	1.124
7 or more	1	1.124
8 or more	0	0

Personal experience, beliefs and attitudes regarding the use of acupuncture

Understanding and perceptions of how acupuncture works to assist IVF

Subjects were asked about their understanding of how acupuncture might help them as infertility patients conceive. 45% subjects agreed with the statement 'Stress reduction'. 44% of subjects selected 'Relaxation', 32% for 'Improves implantation', 27% for 'Improves egg quality', and 18% agreed with 'Improves immune system'. (Refer to Figure 2.)

Figure 2: Patient perceptions of how acupuncture works



Five alternative explanations of how acupuncture might work in the setting of IVF were recorded (6%). Three respondents felt that acupuncture 'improves blood circulation', while two others thought that it 'improve(s) digestive system (coeliac)' and one respondent stated that 'the above may influence CNS – hormone and immune function'. Seven other statements (8%) expressing uncertainty or that subjects were unaware of its use in IVF were recorded. (Refer to Table 4.)

Table 4: Understanding and perceptions of how acupuncture works to assist IVF

How acupuncture works	*N* = 89 *n*	%
Stress reduction	40	44.944
Relaxation	39	43.820
Improves implantation	28	31.461
Improves hormone balance	24	26.966
Improves egg quality	21	23.596
Improves immune system	16	17.978
Other		
Alternative explanations	5	5.618
"Improves blood circulation"		
"Improve digestive system (coeliac)"		
"The above may influence CNS - hormone & immune function."		
Not sure or not aware of its use	7	7.865
"Don't know."		
"Not sure."		
"Haven't heard."		
"I didn't know that it might help to conceive."		

History of acupuncture use

When asked about past use of acupuncture for all purposes, 45% reported past acupuncture use, while 55% had never used acupuncture before. The purpose of the acupuncture therapy was then queried. 67.5% of acupuncture users indicated that it was used in conjunction with IVF, while 37.5% indicated that they had used acupuncture for purposes other than IVF, indicating a 5% overlap of users who fell into both categories. Subjects were asked to specify the purpose of their acupuncture use, and list of 18 conditions were compiled from answers. (Listed in detail in Table 5.)

Table 5: History of acupuncture use

Have used acupuncture before	*n* *N* = 89	%
Yes	40	44.944

No	49	55.056
Purpose of acupuncture use	*N* = 40	
Used in conjunction with IVF	27	67.5
Used for other things	15	37.5
Assist with anxiety		
Back pain		
Balance		
Fibromyalgia		
Headaches		
Hormonal balance		
Infertility		
Loss of sight		
Migraines		
Muscle pain		
Neck pain		
Pain management		
Prevent uterine contraction		
Relaxation		
Shoulder injury		
Shoulder surgery recovery		
Stress		
Weight loss		

When past acupuncture users were asked about their reasons for using it, 85% agreed with the reason, 'I was willing to try anything to help my condition.' 22% indicated agreement with the statement 'I believed it would definitely help my condition.' 22% had used acupuncture as it was 'Recommended by family/friends' while 15% used it because they were 'Recommended by GP/specialist.' No alternative reasons were given. (Summary in Table 6.)

Table 6: Reasons for choosing to use acupuncture

N = 27

Reasons for using acupuncture	*n*	%
I was willing to try anything to help my condition	23	85.185
I believed it would definitely help my condition	6	22.222
Recommended by family/friends	6	22.222
Recommended by GP/specialist	4	14.815
Other	0	0

The remaining 55% of subjects who had not used acupuncture before were queried on their reasons for not doing so. 65% of subjects indicated that they had 'Never thought about trying', 11% agreed that they 'Don't like needles', 9% indicated that they 'Have not heard of it before', 7% agreed with the statement 'Don't think it's worth the extra cost' and 4% indicated that they 'Don't believe it works'. 8 subjects gave an alternative reason for not using acupuncture. Reasons that indicate consideration or future intent of use included 'Was considering, however fell pregnant,' 'Will attempt once IVF cycle begins,' 'Trying it tomorrow,' 'Am interested if advised by Doctor,' and 'Acupuncturist did not recommend for me. He gave me Chinese herbs instead.' Other reasons include 'Insufficient evidence that it works vs. cost,' and 'We don't have (the) opportunity.' (Refer to Table 7 for all responses.)

Table 7: Reasons for not choosing to use acupuncture

	N = 54	
Reasons for not using acupuncture	*n*	%
Never thought about trying	35	64.815
Don't like needles	6	11.111
Have not heard of it before	5	9.259
Don't think it's worth the extra cost	4	7.407
Don't believe it works	2	3.704
Other	8	14.815
'Was considering, however fell pregnant.'		
'Will attempt it once IVF cycle begins.'		
'Insufficient evidence that it works vs. cost.'		
'We don't have opportunity.'		
'Trying it tomorrow.'		
'Acupuncturist did not recommend for me. He gave me Chinese herbs instead.'		
'Am interested if advised by Doctor.'		

Subjects were asked about interest in using acupuncture if given recommendations in three instances by three different groups of people – family/ friend, GP or specialist. This question was targeted at subjects who had never used acupuncture with IVF, hence responses of subjects who erroneously responded were excluded. Responses of subjects who had used acupuncture but not for the purpose of IVF were included. They were asked to select either a 'Yes' or 'No' for each instance to indicate potential interest. 37% of subjects indicated they would be interested if recommended by family or friends, while 32% indicated that they would *not*. 51% of subjects indicated interest if recommended by a GP, while 18% would *not* be interested. 76% of subjects indicated that they would be interested if recommended by a specialist, while 11% indicated that they would *not* be. (Refer to Table 8.)

Table 8: Interest in acupuncture use if given recommendation

NB: Subject responses were excluded if subjects had reported use of Acu with IVF. Responses of subjects who had used Acu but not for IVF were still included.

	N = 57	
Interest if recommended by	*n*	%
Family / Friend		
Yes	21	36.842%
No	18	31.579%
GP		
Yes	29	50.877%
No	12	17.544%
Specialist		
Yes	43	75.439%
No	6	10.526%

Discussion

This study reveals the pattern of CM use amongst patients undergoing current IVF treatment at an infertility clinic in Sydney, Australia. It specifically reveals the extent of acupuncture use in this subpopulation and uncovers some underlying perceptions and beliefs held toward this form of CM. Data collected revealed that the a large proportion of patients attending this infertility clinic had used CMs in the management of their infertility. Vitamins and minerals were the most commonly used CM by 64% of subjects, followed by acupuncture at 37%. This confirmed our presuppositions about the increasing trend of acupuncture use amongst infertility patients that were gathered following a review of current literature. Chinese Herbs were the third most common CM used. It is deduced that this is so because many who consult Traditional Chinese Medicine (TCM) practitioners for acupuncture treatment are often concurrently given Chinese herbs. This highlights a concern that more research needs to be done to examine the safety and efficacy of such treatment when used in the management of infertility, given that there may be drug interactions and side effects caused by using CM modalities in adjunct to conventional medicine. A further concern is the level of disclosure of CM use by patients to their fertility specialists and whether the latter are proactive in procuring this information from patients.

Analysis of the data collected on understanding and perceptions of how acupuncture works as an adjunct to IVF revealed that the most commonly held belief was that it aided in stress reduction (45%). This reinforces the notion that IVF, despite being a treatment for infertility, in itself carries a great deal of stress as recognised in patient perceptions here, hence leading to patients seeking supplementary measures in coping with the management of their infertility (de Lacey et al, 2009). The second most held belief is that acupuncture aids the IVF process by relaxation (44%), again

uncovering patient beliefs that there is indeed a need for increased relaxation during the process of treatment.

These findings are in line with the notion that acupuncture therapy appears to address health in a more holistic way when compared to conventional medicine. This appears to take the form of close patient-practitioner relationships, which in general take place in a calmer, less clinical and less rushed environment, addressing both physical and non-physical aspects of health. Acupuncture use has also been linked to an increased sense of self-awareness and empowerment, providing patients with a form of emotional support, and promoting wellbeing and wholeness, in that patients are left feeling that issues they faced as a whole person, not just the physical aspects, were addressed (Gould and MacPherson, 2001, de Lacey et al, 2009). If such CM modalities are found to have decreased patient perceived stress (Gould and MacPherson, 2001) in some way improve IVF outcomes, there must be aspects of this practice that could be harnessed and applied throughout the practice of medicine as we know it. This finding is paradigm shifting in that it suggests that a more patient-centred, holistic approach to medicine that is lacking in the current practice of medicine may be what is needed to aid better health outcomes. Furthermore, this challenges the notion of health outcomes being limited to physical manifestations of health and disease, and excluding other less tangible aspects of health such as patient perceptions of wellbeing.

Notably, 72% of subjects responded to this question. That is, a majority of them had some idea or opinion of how acupuncture might work, suggesting that IVF patients are in general well-read or have acquired prior awareness and knowledge of acupuncture. Investigating the source of their knowledge or opinions may be useful in future research.

A sizeable proportion (45%) of subjects reported past use of acupuncture. Of these subjects, 67.5% reportedly employed its use as an adjunct to IVF treatment, while 37.5% used it for other purposes. 5% of them had used acupuncture for both.

This high background rate of acupuncture users in this patient population may be attributable to the fact that the two specialists with whom these patients were consulting with at IVFA had positive views of, or at least were not opposed to acupuncture use. Hence this could have inadvertently introduced selection bias, as fertility specialists' opinion of acupuncture may have had an impact upon the likelihood of their patients' uptake. Alternatively these specialists may also attract patients who already hold pro-acupuncture views. It was not possible to account for the extent of these associations in this study. The correlation between fertility specialists' views on acupuncture use and the likelihood of their patients' uptake of adjunctive acupuncture is an area worth investigating in future research.

Based on responses given by subjects about the purpose of their acupuncture use, a myriad of ailments were listed (Refer to Table 5), suggesting that these patients had a certain extent of confidence in using acupuncture for these purposes. Many of these exemplified the role of acupuncture in pain management, as has been well established in medical literature.

The vast majority (85%) of acupuncture using subjects stated that their reason for uptake was that they were 'willing to try anything' to help their condition. Taking into account that the average profile of acupuncture user subjects was 36 years old (SD = 5.458), currently nulliparous with an average infertility history of 3.6 years (SD = 2.755), had undergone 4 IVF cycles (SD = 4.123) and are active income earners (92.5%), it is unsurprising that this indication of a willingness to attempt any possible means of increasing their chances of a successful pregnancy was a prevalent reason for uptake of acupuncture. (Refer to Table 9.) 22% indicated that they 'believed it would definitely help (their) condition', which reveals that not all acupuncture users had complete faith in its efficacy. More subjects chose to use acupuncture following recommendations by family or friends than by GPs or specialists (22% vs 15%). It appears unlikely that patients find GP or specialist recommendations less persuasive in their decision-making process, as our data shows that more than half of non-acupuncture users indicated interested in uptake if recommended by a specialist

(75%) or a GP (51%). (Refer to Table 8.) Hence it seems more plausible that recommendations by GP or specialist were the least given reason for acupuncture uptake possibly because the use of acupuncture or complementary therapies is generally not addressed or discussed in consultations with Australian GPs and fertility specialists, unless first raised by patients themselves (Rayner et al, 2010). Nevertheless, it may still be possible that acupuncture and non-acupuncture users hold differing views with regard to which recommendations more strongly influence them.

Upon analysis of the sociodemographic characteristics of subjects, it was found that two characteristics that differed significantly was that acupuncture users had experienced a longer period of infertility and had undergone more IVF cycles than non-acupuncture users. These differences were both statistically significant ($p < 0.05$ – Refer to Table 9.) This finding is in line with the presupposition that as patients experience increasing length of infertility and number of treatment cycles, they may grow increasingly desperate and hence willing to experiment with other adjunctive therapies such as acupuncture.

Table 9: Socio-demographic characteristics of acupuncture using and non-acupuncture using subjects, mean (SD) or n (percent)

	Acupuncture	No acupuncture	*p*-value *
Age	35.95 (5.458)	35.24 (5.158)	0.5336
Employment Status **			0.3313
Income earning	37 (92.5)	40 (85.106)	
Non-income earning	3 (7.5)	7 (14.894)	
No. of children	0.4048 (0.6648)	0.5319 (0.6545)	0.3663
Length of infertility	3.595 (2.755)	2.447 (2.480)	0.0416
No. of IVF cycles	3.837 (4.123)	1.196 (2.029)	0.0002

* T test or Fisher's exact test.
** NB: Students were categorized in the 'non-income earning' group.

Responses of non-acupuncture user subjects revealed that the main reason for not using acupuncture was that they had 'never thought about trying' (65%). On hindsight this question was not ideally phrased, as it did not elicit more specific rationales for their choice. Some possibilities include a lack of information or education on acupuncture's uses, specifically its use in infertility management, or lack of recommendation by doctors, family and friends. Nonetheless, this still provides insight into the decision making process of patients, in that it suggests most non-acupuncture users' do not uptake this modality primarily due to a passive decision making process rather than an active stance against it. This notion is further supported by the fact that a minority of subjects agreed with statements that took an active stance against acupuncture use, such as 'Don't like needles' (11%), 'Don't think it's worth the extra cost' (7%) and 'Don't believe it works' (4%). Worth noting is that out of the 8 responses given for 'other reasons', 5 subjects indicated past or potential interest in its uptake. (Refer to Table 9 for full statements.)

Data analysis showed that subjects were more likely to show potential interest towards acupuncture use following recommendations by specialists (75%) rather than GPs (51%) and rather than family or friends (37%) (Refer to Table 10). Not all subjects gave a response to these questions, hence in terms of negative responses the trend was found to be similar, with most negative responses being for recommendations by family or friends (32%), followed by GPs (18%), and least of all specialists (11%). These findings reveal the attitudes that patients have towards these various groups of people, and highlight the influence that fertility specialists have in patients' likelihood of uptake of acupuncture. They also reveal that the less expertise a group has in the field of fertility medicine, the less likely subjects are to develop interest in using acupuncture following their recommendation. This may be attributable to the fact that patients who may have reservations about acupuncture view recommendations by fertility specialists as an endorsement of its safety and possible efficacy. Nonetheless it may be useful to conduct further research into the

reasons behind these choices and what the exact factors that shape these decision-making processes are.

Given these findings, it is hence vital for fertility specialists to keep abreast in this area of research as their opinions are so highly regarded by patients, so that they can provide relevant and accurate advice. It may also be important to consider greater education of fertility specialists who have not taken a stance or interest in the use of acupuncture with IVF patients.

Limitations

Some of the limitations of this study includes the small sample size and that we did not have access to recruiting patients of all fertility specialists at the fertility clinic, hence being limited to only recruiting the patients of two specialists as previously mentioned. This cautions against drawing conclusions from this study to all patient populations.

The structured self-completion questionnaire had its limitations, in that questions had to be very brief and straight-forward, to enable subjects to answer them within the very short window of time available in waiting rooms. This prevented us from including questions that probed deeper into their beliefs, and from formatting the survey with more open-ended questions. However, it still enabled us to glean important findings about patient perspectives.

Conclusions

This study demonstrates the increasing interest in and use of CMs, and in particular acupuncture, amongst IVF patients. It has aided in uncovering several key patient beliefs and attitudes toward the use of acupuncture, which appear to be instrumental in their decision-making process of uptake of this adjunct modality. These include the fact that patients view acupuncture as a means of stress reduction and relaxation during the process of IVF, reinforcing the notion that IVF itself can be a source of stress which leads patients to seek such coping strategies. This finding suggests that the mechanism by which acupuncture may improve IVF outcomes lies in its ability to decrease patient-perceived stress, by way of a more patient-centred, holistic approach of medicine that may be lacking in the realm of current conventional medical practice.

Another significant finding in terms of patient beliefs was that the predominating motivation for acupuncture uptake amongst IVF patients was a willingness or desperation to try anything that might improve their chances of conceiving. A socio-demographic comparison also revealed that uptake of acupuncture for IVF correlated with increasing length of infertility and number of treatment cycles patients had undergone, highlighting the importance of how these factors interplay with and perhaps shape a patient's decision making process.

The aforementioned motivation predominated over personal belief in acupuncture's efficacy in aiding IVF success rates, which again reiterates the benefits that acupuncture appears to have in terms of addressing patient wellbeing and health as a whole, even if in terms of quantifiable clinical outcomes there may not be a measurable amount of benefit. It perhaps provides a sense of closure for patients as it empowers them to feel that they have exhausted all possibilities and options, enabling them to come to terms psychologically and emotionally with their predicament, which may in turn aid their physical ability to cope with the stresses of IVF treatment. These

ideas challenge the way studies that have been attempting to elucidate the efficacy of acupuncture in IVF have been conducted thus far, perhaps signaling a need to define its efficacy in ways other than quantifiable clinical outcomes.

This study further reveals the immense influence that fertility specialists have over their patients' likelihood of acupuncture uptake, which was found to be greater than family or friends' and GPs' recommendations. The implications of this is that fertility specialists should increase in their consciousness of the existence of such adjunct modalities and be able to recommend it to patients who may potentially find benefit in its uptake, such as those who have been undergoing an extensive length of fertility treatment and require an added means of stress management.

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