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Naturopaths' engagement with preconception and perinatal care: A secondary analysis of the practitioner research collaboration and initiative

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ABSTRACT

Objectives: Naturopaths provide care to patients across all life stages and are visited by some members of their community for assistance with preconception, fertility, pregnancy and postnatal care. This study aims to describe the practice behaviours of naturopaths with a special interest in women's health and who regularly provide care to pregnant women.

Methods: A secondary analysis of data collected through the Practitioner Research and Collaboration Initiative (PRACI).

Results: Of the 281 naturopaths included in the analysis, 79.4% (n=223) indicated they have an interest in women's health and 70.1% (n=110/157) reported regularly treating pregnant women. Naturopaths who identified as having a clinical interest in women's health were more likely to be female rather than male (OR 12.9) and were more likely to regularly prescribe herbal infusions (OR 3.5). Naturopaths who regularly treated pregnant women were more likely to also treat infants and toddlers (OR 8.8). Naturopaths were also less likely to report having received their first qualifications 15 or more years ago compared to less than 15 years ago if they reported regularly treating pregnant women (OR 0.1–0.2).

Conclusions: The self-reported practice behaviours of naturopaths providing care to women for reproductve and maternal health suggest a possible alignment with the domains prioritised in global health recommendations, however the degree to which naturopaths are providing accurate information is unclear. Naturopaths may play a role in the contemporary delivery of maternal and child health care, but a closer examination is needed to ensure women are receiving the appropriate care during this important life stage.

1. Introduction

The United Nation's Sustainable Development Goal of Good Health and Wellbeing provides targets to improve maternal and child health globally[1]. For this to be achieved, women require access to health services across preconception, pregnancy, birth, and the postpartum periods[2]. Preconception care is often neglected but is important as women who are well at conception are more likely to achieve a successful pregnancy and have a healthy newborn [3]. Parental preconception exposures have also been linked with the offspring's health outcomes in adulthood – known as the developmental origins of health diseases(DOHaD) – via epigenetics[4]. For this reason, the preconception period – defined as the weeks, months or years before pregnancy – is increasingly recognised as a critical period for preventing pregnancy complications, adverse birth outcomes and health problems in the child's later life[3]. Women also require appropriate care during the perinatal period – a time inclusive of pregnancy and the first year following birth – to achieve positive outcomes for the woman and child [5]. As such, access to accurate health information and quality health care before each pregnancy is vital to achieving optimal health outcomes for multiple generations.

Three out of four Australian women report that their pregnancy is 'intended'[6]. During this time, women may be amenable to modifying their health behaviours to reduce the incidence of adverse health outcomes for themselves and their babies[3]. This is reflected in Australia's *National Strategy for Women's Health 2020–2030* which emphasises the importance of preconception health and promotes primary health care services to support pregnant women[7]. Recent guidelines by the Royal

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Australian College of General Practitioners (RACGP) recommend women planning to conceive should receive screening for pregnancy intention and be given relevant advice on medical risk factors, lifestyle characteristics, immunisation, as well as folate and iodine supplementation[8]. Despite increasing public interest in health preparation for pregnancy[7], preconception service providers in Australia[9] and internationally[10] are not well distributed or clearly identified. In contrast, the Australian maternity healthcare system is well established and includes a mix of service providers and delivery models[11]. Yet, some women report not having their health needs met during pregnancy, labour and birth[12]. Similarly, women in the postnatal period have reported feeling under-supported in various aspects of health including breastfeeding and mental health[13]. These critical periods in a woman's reproductive life require coordinated care which supports the current pregnancy and optimises health before further childbearing [14].

Naturopathy is a traditional medicine system that may play a role in this underserved area of reproductive health care. In Australia, naturopaths represent one of the most popular health care professions practicing outside of the mainstream health system[15]. However, naturopaths are not included in the National Registration and Accreditation Scheme and, rely on a voluntary, independent register as a self-regulatory mechanism[16]. Despite their peripheral position within the Australian health services and regulation structure, naturopaths in Australia are consulted by women during the preconception[17] and perinatal[18] periods.

While qualitative research has described Australian naturopaths' perceptions and experiences of providing care to pregnant women[19], details of practice behaviours within the context of preconception and maternity care remain unexamined. In response, this study aims to describe the practice behaviours of naturopaths with a special interest in women's health and who regularly provide care to pregnant women to better understand the potential contribution of naturopathic care across the childbirth continuum.

2. Materials and methods

2.1. Design

This study presents a secondary analysis of data collected through the Practitioner Research and Collaboration Initiative(PRACI).

2.2. Setting

PRACI is a national multi-profession practice-based research network established in Australia in 2014[20]. It includes 1,053 members from 14 different professions[21]. The PRACI membership database was established through a national universal baseline survey completed by all members [20] administered in 2014. A second survey followed this baseline survey round targeting the members based on profession-specific clusters (e.g., ingestive medicine, manual therapies) in 2015. Responses to both surveys were linked through participant identification numbers. The baseline survey was completed by 281 members identifying as having a qualification in naturopathy, of which 129 completed the profession-specific survey.

2.3. Participants

This study samples all members of PRACI that identified in the baseline survey as having a qualification in naturopathy.

2.4. Instrument

The data analysed for this study was collected via two linked online survey instruments. Specific survey items utilised for this analysis included practitioner characteristics, practice characteristics, and practice behaviours of naturopaths. Further details regarding the instrument development have been reported previously[20]. The specific datasets used to source the variables employed in the analysis are presented in Fig. 1.

In the baseline survey, practitioners were asked to indicate their age, gender, and years since receiving their first professional qualification. Survey items also asked practitioners to indicate areas of special clinical interest or focus and to identify the type of training they had received on their clinical interest area.

The baseline survey also invited practitioners to provide the average number of days and hours per week they were in practice as well as the average number of clients seen per week and new client consultations per month. They were also invited to indicate whether they were in solo clinical practice or shared their clinical location with other health professionals.

Practitioners answered additional questionnaire items in the baseline survey to indicate the frequency with which they discussed specific topics with their clients. The follow-up survey further explored practice behaviours by asking practitioners to indicate the frequency with which they treated specific conditions and prescribed various treatments relevant to their profession. The practitioners' interprofessional referral behaviours were also explored in this second survey.

2.5. Data analysis

All PRACI members who identified as having a qualification in naturopathy were extracted from the full PRACI database. Descriptive statistics for all variables of interest were reported via frequencies and percentages. Practitioner characteristics, practice characteristics and practice behaviours were compared between naturopaths who identified as having a clinical interest in women's health and those who did not. A further analysis of practice characteristics and practice behaviours was undertaken comparing the naturopaths who reported treating pregnant women regularly – defined as 'sometimes' or 'often' - and those that did not. Variables related to practice characteristics were selected for analysis in this section based on their alignment with the national or international guidelines for preconception, pregnancy or postnatal care [3,8]. Categorical variables were compared using chi square tests. Categorical and continuous variables were compared using student t-tests. Statistical significance was set at p=.05 with effect size for univariate analysis determined by Cramer's V. The effect size was classified as negligible association(.00 to <.10); weak association(.10 to <.20); moderate association(.20 to <.40); relatively strong association(.40 to <.60); strong association(.60 to <.80) and very strong association(.80 to <1.00), as reported by Rea and Parker[22].

Backwards stepwise logistic regression analyses were employed to identify the most parsimonious model of predictors associated with naturopaths identifying(1) a clinical interest in women's health and(2) treating pregnant women 'sometimes' or 'often'. Independent categorical variables identified by bivariate analyses as potential confounders (defined as *a p* value <.10) were entered into the baseline regression models as relevant. Revised models at each step of the analyses was verified using a likelihood ratio test. Data were analysed using Stata 14.2 (StataCorp).

3. Results

There were 281 PRACI members that reported having a naturopathic qualification(see Table 1). Of these, 79.4%(n=223) naturopaths identified having a special interest in women's health(n=223).A greater proportion of female compared to male naturopaths indicating a clinical interest in women's health(V=.26; p<.001). There was no statistically significant difference in their mean age, level of naturopathic qualification, years in practice, average time spent in clinical practice, or number of clients among naturopaths with an interest in women's health compared with those who did not indicate an interest in women's health

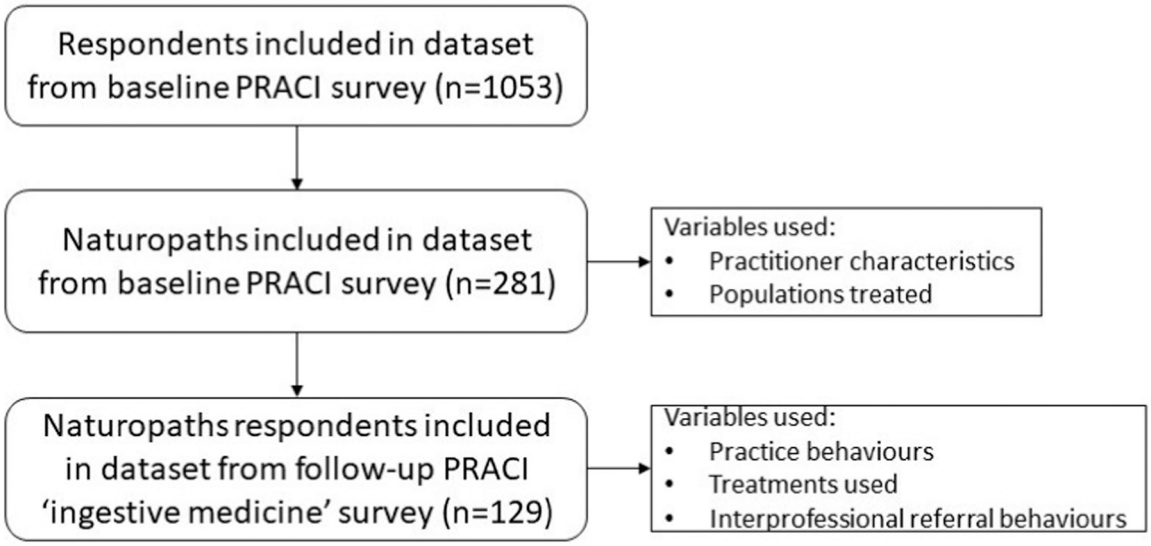

Fig. 1. Flowchart of dataset sources for variables used in analysis.

Table 1
Practitioner characteristics of naturopaths that identify as having a clinical interest in women's health or regularly treat pregnant women compared with the entire sample.

Practitioner characteristics	All naturopaths (n=281)			Clinical interest in women's health (n=223)				Regularly treat pregnant women (n=110)[±]			
	Mean	*SD*	*CI*	*Mean*	*SD*	*CI*	*p*	*Mean*	*SD*	*CI*	*p*
Age	45.6	10.4	44.3–46.8	45.3	10.5	43.9–46.7	.38	45.5	10.1	43.5–47.6	.81
	N	***%***		***N***	***%***	***V***		***N***	***%***	***V***	
Gender											
Female	243	86.5		203	91.0	.26	<.001	86	86.0	.03	.72
Male	38	13.5		20	9.0			14	14.0		
Naturopathic qualification*											
Certificate	10	3.6		8	3.6	<.01	.96	2	2.0	.07	.38
Diploma	31	11.0		24	10.8	.02	.78	14	14.0	.10	.23
Advanced diploma	138	49.1		112	50.2	.04	.46	44	44.0	.09	.30
Bachelor	128	45.6		102	45.7	<.01	.90	49	49.0	.04	.60
Years since first qualification											
Less than 5 years	56	19.9		42	18.8	.10	.59	12	12.0	.40	<.001
5–9 years	56	19.9		48	21.5			15	15.0		
10–14 years	50	17.8		41	18.4			22	22.0		
15–19 years	48	17.44		39	17.5			16	16.0		
20 years or more	70	24.9		53	23.8			35	35.0		
Practice environment											
Solo practice in all practice locations	128	45.7		102	46.0	.01	0.99	32	32.3	.25	.01
Solo practice in at least one practice location	75	26.8		59	26.6			38	38.4		
Not in a solo practice	77	27.5		61	27.5			29	29.3		
	Mean	***SD***	***CI***	***Mean***	***SD***	***CI***	***p***	***Mean***	***SD***	***CI***	***p***
Average days per week in practice	3.6	3.8	3.14–4.0	3.5	3.4	3.1–4.0	.71	4.0	4.7	3.1–5.0	.13
Average hours per week in practice	17.7	18.2	15.6–19.9	18.2	19.6	15.6–20.7	.43	21.5	26.0	16.3–26.7	.05
Average number of clients per week	12.2	10.3	11.0–13.4	12.2	10.3	10.8–13.5	.91	14.5	10.0	12.5–16.5	<.001
Average number of new clients per month	26.9	124.6	12.1–14.6	27.8	138.1	9.6–46.1	.80	22.4	30.1	16.2–28.5	.01

[±]Includes participants that identified as 'sometimes' or 'often' treating pregnant women; N=157 (total item responses)
* Respondents were able to select more than one option

(see Table 1). Naturopaths who reported regularly treating pregnant women represented 70.1% of respondents to that survey item(n=110/157). There was a statistically significant difference in the years since these naturopaths first qualified(V=.40; p<.001) with a trend towards a higher proportion of naturopaths with more years in practice reporting regularly treating pregnant women. Naturopaths were also more commonly in solo practice in at least one, but not all, practice locations (V=.25; p=.01) and reported a greater number of average hours per week in clinical practice(p=.05). Naturopaths also reported a greater average number of clients per week(p<.001) but a lower average number of new clients per month(p=.01) compared to naturopaths who do not regularly treat pregnant women.

Table 2 presents the univariate analysis of practice characteristics for both groups. Naturopaths with a clinical interest in women's health more frequently reported providing health care related to stress management(V=.38,p=.002) and treating pregnant women 'sometimes' or 'often'(V=.17,p=.05). They also prescribed herbal infusions more frequently than other naturopaths(V=.23,p=.02). Naturopaths that reported regularly treating pregnant women more frequently discussed diet and nutrition recommendations (V=.16, p=.05) and physical activity and fitness(V=.16,p=.05) compared to naturopaths that did not. Participants in this study also reported treating infants and toddlers (V=.36,p<.001), children(V=.19,p=.02), and young adults(V=.22, p=.005) more often compared to other naturopaths. Referral of patients

Table 2
Practice behaviours relevant to preconception and antenatal care guidelines reported by naturopaths identifying as having a clinical interest in women's health or regularly treating pregnant women.

Practice behaviours	All participants (n=281)		Clinical interest in women's health (n=223)				Regularly treat pregnant women (n=110)[±]			
	Never/ Rarely n (%)	*Sometimes/ Often n (%)*	*Never/ Rarely n (%)*	*Sometimes/ Often n (%)*	*V*	*p*	*Never/ Rarely n (%)*	*Sometimes/ Often n (%)*	*V*	*p*
Topics discussed with patients										
Diet and nutrition	2 (1.4)	141 (98.6)	1 (0.9)	116 (99.2)	.09	.24	1 (0.9)	109 (99.0)	.16	.05
Stress management	1 (0.7)	141 (99.3)	1 (0.9)	115 (99.1)	.04	.85	1 (0.9)	108 (99.1)	.05	.54
Physical activity and fitness	3 (2.1)	138 (97.9)	2 (1.7)	114 (98.3)	.06	.47	1 (0.9)	107 (99.1)	.16	.05
Use of tobacco, illicit drugs, or alcohol	13 (9.2)	128 (90.8)	11 (9.5)	105 (90.5)	.02	.82	8 (7.4)	100 (92.6)	.15	.07
Counselling and mental health	7 (6.1)	108 (93.9)	6 (6.3)	90 (93.8)	.02	.87	5 (5.7)	83 (94.3)	.01	.94
Occupational health and safety	74 (52.5)	67 (47.5)	62 (53.5)	54 (46.6)	.04	.62	53 (48.6)	56 (51.4)	.07	.36
Vaccination	72 (63.2)	42 (36.8)	60 (62.5)	36 (37.5)	.03	.74	52 (60.5)	34 (39.5)	.09	.35
Conditions treated										
Depression or anxiety	7 (5.0)	134 (95.0)	4 (3.5)	112 (96.5)	.15	.07	4 (3.5)	112 (96.6)	.04	.07
Stress	2 (2.9)	67 (97.1)	0 (0.0)	57 (100.0)	.38	.002	1 (1.9)	53 (98.2)	.16	.17
Drug or alcohol addiction	73 (62.4)	44 (37.6)	58 (59.8)	39 (40.2)	.12	.20	54 (60.0)	36 (40.0)	.07	.50
Population treated										
Infant/toddler (Up to 3 years)	67 (57.8)	49 (42.2)	55 (57.3)	41 (42.7)	.02	.82	40 (45.5)	48 (54.6)	.36	<.001
Children (3–12 years)	47 (33.1)	95 (66.9)	36 (31.0)	80 (69.0)	.09	.27	32 (29.4)	77 (70.6)	.19	.02
Adolescents (13–18 years)	26 (18.2)	117 (81.8)	19 (16.2)	98 (83.8)	.11	.20	19 (17.3)	91 (82.7)	.14	.08
Young adults (19–35 years)	39 (27.5)	103 (72.5)	31 (26.7)	85 (73.3)	.04	.68	21 (19.3)	88 (80.7)	.22	.005
Pregnant women	43 (30.1)	100 (69.9)	31 (26.5)	86 (73.5)	.17	.05	-	-	-	-
Treatments used or prescribed										
Lifestyle prescription (n=42)	1 (0.9)	114 (99.1)	1 (1.0)	95 (99.0)	.04	.66	1 (1.1)	87 (98.9)	.06	.54
Specific diets (n=42)	11 (9.6)	104 (90.4)	9 (9.4)	87 (90.6)	.02	.88	6 (6.8)	82 (93.2)	.17	.06
Liquid herbal medicines (n=46)	13 (11.3)	102 (88.7)	11 (11.5)	85 (88.5)	.01	.91	10 (11.5)	77 (88.5)	.10	.92
Relaxation exercises (n=42)	16 (14.0)	98 (86.0)	14 (14.7)	81 (85.3)	.05	.63	12 (13.8)	75 (86.2)	.02	.81
Meditation (n=42)	13 (11.3)	102 (88.7)	11 (11.5)	85 (88.5)	.01	.91	10 (11.4)	78 (88.6)	.03	.72
Exercise prescription (n=41)	20 (17.4)	95 (82.6)	15 (15.6)	81 (84.4)	.10	.26	15 (17.2)	72 (82.8)	.01	.90
Compound nutritionals (n=41)	38 (33.0)	77 (67.0)	30 (31.3)	66 (68.8)	.09	.36	27 (31.0)	60 (69.0)	.11	.24
Herbal infusions (n=42)	61 (53.5)	53 (46.5)	46 (48.4)	49 (51.6)	.23	.02	45 (51.7)	42 (48.3)	.03	.78
Culinary herbs (n=42)	40 (34.8)	75 (65.2)	33 (34.4)	63 (65.6)	.02	.84	33 (37.5)	55 (62.5)	.10	.29
Interprofessional referral behaviours										
Refers to GP (n=129)	4 (2.9)	136 (97.1)	3 (2.6)	113 (97.4)	.04	.67	2 (1.9)	105 (98.1)	.17	.04
Referred from GP (n=102)	34 (63.0)	20 (37.0)	28 (65.1)	15 (34.9)	.09	.52	28 (60.9)	18 (39.1)	.04	.78
Refers to specialist doctor (n=97)	30 (65.2)	16 (34.8)	27 (69.2)	12 (30.8)	.20	.18	24 (60.0)	16 (40.0)	.12	.36
Referred from specialist doctor (n=94)	41 (85.4)	7 (14.6)	35 (87.5)	5 (12.5)	.13	.36	35 (83.3)	7 (16.7)	.12	.38
Refers to nutritionist (n=116)	95 (81.2)	22 (18.8)	82 (82.8)	17 (17.2)	.10	.29	68 (73.9)	24 (26.1)	.17	.05
Referred from nutritionist (n=98)	39 (79.6)	10 (20.4)	31 (75.6)	10 (24.4)	.22	.12	33 (75.0)	11 (25.0)	.19	.15
Refers to dietician (n=121)	110 (92.4)	9 (7.6)	93 (93.9)	6 (6.1)	.12	.17	83 (88.3)	11 (1.7)	.14	.10
Referred from dietician (n=96)	41 (85.4)	7 (14.6)	33 (82.5)	7 (17.5)	.18	.20	35 (81.4)	8 (18.6)	.23	.08

[±] Includes participants that identified as 'sometimes' or 'often' treating pregnant women; N=157 (total item responses)

to general practitioners(GPs)(V=.17,p=.04) and nutritionists(V=.17, p=.05) was also more common among naturopaths who regularly treated pregnant women when compared to other naturopaths.

Logistic regression analysis(results not tabulated) found that naturopaths who identified as having a clinical interest in women's health were significantly more likely to be female(OR12.9, CI 3.8–43.8, p<.001) and were more likely to regularly('sometimes' or 'often') prescribe herbal infusions(OR3.5, CI 1.0–12.7, p=.05). Naturopaths who regularly ('sometimes' or 'often') treated pregnant women were more likely to also treat infants and toddlers (OR8.8, CI 2.7–29.0, p<.001). They were also less likely to report having received their first qualifications 15 or more years ago, compared to naturopaths who did not report regularly('sometimes' or 'often') treating pregnant women (15–19 yrs:OR0.2, CI 0.04–0.7, p=.01; >20 yrs: OR0.1, CI 0.03–0.5, p=.003).

4. Discussion

This first examination of the practice behaviours of naturopaths most likely to be providing preconception and perinatal care highlights some interesting findings concerning information sharing, referral and approaches to care.

Firstly, our analysis suggests naturopaths regularly share important information with women for optimal maternal and infant outcomes. Within the preconception period, diet and nutrition, mental health, substance use and physical activity feature prominently in the topics discussed by naturopaths. The WHO highlighted these as important elements in preconception care[3] and are listed in the RACGP clinical guidelines for preconception care[8]. Our analysis found that most naturopaths discuss these topics irrespective of whether they reported a specific clinical interest in women's health. Sharing information on these topics is important because substantive evidence suggests that they influence pregnancy outcomes[23–25] and health in later life[26]. However, our data provides no insights as whether these topics are discussed within the context of maternal and child health. Equally, it is unclear from our analysis what specific information is included in naturopaths' discussions with women in their care. As such, both areas warrant further exploration.

Our analysis also indicates naturopaths are engaging with population groups identified as important targets for preconception[26] and interconception[14] care. Adolescents are considered a key population for the focus of preconception health interventions such as health education[27]. In addition, previous research suggests women are not receiving adequate care between pregnancies to promote health and wellbeing[28]. Appropriately educated naturopaths may provide a valuable source of health information and support women during the postpartum period. While our data only presents associations, more than half of naturopaths who regularly treat pregnant women also treat children between infancy and 12 years old. This indicates that women who consulted with a naturopath during pregnancy may continue to

seek their advice after their child is born. Similarly, the frequency with which naturopaths communicate about topics that are central to improved preconception health and pregnancy outcomes, highlights the potential for a positive impact on maternal and child health for current and future generations. This is relevant even if the population they are treating are young adults who are not planning a pregnancy. These findings highlight the potential of naturopaths to play an important role in improving maternal and infant health outcomes through health education and the provision of interconception care; however, this warrants further research.

The most common modalities respondents in our study prescribed, such as lifestyle prescriptions, specific diets, mind-body exercises, nutritional supplements and exercise prescription, have the potential to positively impact preconception care and pregnancy when administered appropriately[9]. However, it is also possible for inappropriate treatments to be detrimental. For example, severe restrictive dietary changes during pregnancy cause harm to the developing fetus and the mother[9]. Similarly, many naturopaths treating pregnant women regularly prescribe herbal medicines. Some herbal medicines are known teratogens or may cause spontaneous abortion while others have a confirmed safety profile in pregnancy[29]. An additional risk associated with consumption of herbal tinctures during pregnancy is the ingestion of alcohol which is used in the manufacture process. The international guidelines stipulate no alcohol should be consumed during pregnancy[30]. Clinical naturopathic texts describe the issues of herbal medicine use in pregnancy and raises awareness of the need to avoid alcohol consumption from herbal medicine preparations[31]. Further, previous research indicates women who consult a naturopath during pregnancy do not report any increased incidence of adverse birth outcomes[32] and naturopaths who provide care to pregnant women have a clear sense of the scope of their practice and awareness of potential risks from treatments [33]. Despite this previous evidence, a clearer understanding of the specific advice naturopaths are giving to women and the clinical impact of naturopathic care during the preconception and perinatal periods is needed.

Our study's results suggest that overall naturopaths refer to other health professionals more frequently than they are receiving referrals. This is consistent with qualitative research which explored the experiences of health professionals, including naturopaths, attempting to provide care outside of a woman's mainstream maternity care team[33]. Yet, our research also suggests that approximately one-third of naturopaths with a clinical interest in women's health are receiving referrals from GPs. The reasons behind this referral behaviour are unknown but may results from unmet health care needs among women accessing biomedical care. Previous research explored naturopaths' perspectives of their role in contemporary maternity care and found they believed they were filling gaps in the current system by addressing unmet health concerns and treating health complaints neglected by biomedical maternity care[34]. They have also described experiencing barriers to collaborating with biomedical maternity care providers, not the least of which being a perception among naturopaths that other health professionals are not interested in collaborating with them[33].

4.1. Future Research Directions

This study builds on calls for research to examine naturopathic care in the context of women's health[35] and offers clarity and priorities for the next research questions to be addressed. Based on this study's findings, a range of research methods is needed to capture more specific details about naturopathic practitioners' approach to treating women presenting with reproductive health complaints. Qualitative methods could be employed to explore the perspectives and experiences of naturopaths providing care to women, the women accessing naturopathic care, and other health professionals providing care to women also receiving care from a naturopath[36]. Survey research could also be used to examine the prevalence and frequency of specific practice behaviours among naturopaths with regards to women reproductive health[37]. Topics which would benefit from survey research include the dominant health conditions for which women are seeking naturopathic care, interprofessional dynamics, referral pathways and naturopathic approach to risk management within patient care. Both the qualitative and survey research could be conducted independently, or through a mixed methodology framework[38]. The findings from this study also highlights the need to examine the safety and effectiveness of naturopathic care in the management of women's reproductive health. Such clinical research could focus on individual treatments and therapies, or on naturopathic care as a whole system approach[39]. The interventions studied through future clinical research may be informed by the proposed qualitative and quantitative health services research projects[40], or by examining traditional and contemporary clinical texts outlining naturopathic clinical care for the condition of interest[41]. Lastly, there is benefit in undertaking similar research in other countries where naturopathy is practiced to examine the degree to which these findings reflect the practices of naturopathic practitioners internationally.

4.2. Limitations

This study has some limitations. Firstly, there may be recall bias as participants were required to report on their professional practice for the previous 12 months. Secondly, the sample population is limited to PRACI members with naturopathic qualifications and may not provide a full collective view of naturopathic practice despite the included data being drawn from larger database of nationally representative complementary medicine practitioners. Furthermore, analysis is based on naturopaths who identify a special interest in women's health which may encompass gynaecological conditions after reproductive age, such as menopause, or sexual health. The analysis for this study was undertaken using data collected from a sample of naturopaths from Australia. Despite the global naturopathic profession reporting consistency in the principles guiding naturopathic practice and similarities in the treatments and therapies employed by practitioners[42], there are still notable differences in the regulatory landscape[43] and education standards[44] across the various jurisdictions where naturopathy is practiced internationally. Even in countries such as Canada and the United States where naturopathic clinical education is similar to Australia[45], legislation, regulation and scope variations can still result in differences in practice behaviours. As such the generalisability and transferability of the findings to other locations may be limited. These limitations mean the findings from this analysis should only be viewed as exploratory and further research is needed to confirm and better understand them.

5. Conclusions

Naturopaths play a role in the contemporary delivery of maternal and child health care in Australia. The self-reported practice behaviours of naturopaths suggest they often engage in relevant maternal and infant health topics based on global health recommendations, however the degree to which naturopaths provide accurate information is unclear. Further studies are needed to investigate whether naturopaths can contribute to women seeking care for preconception and pregnancy, and to examine the degree to which these findings are representative of naturopathic practice in other countries. Given women are already consulting with naturopaths for assistance with health concerns across the childbirth continuum, this research gap warrants immediate attention from policymakers, researchers, and health professionals.

Ethical clearance

This secondary analysis did not require ethical clearance from a Human Research Ethics Committee.

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CRediT authorship contribution statement

AS: Conceptualization, Methodology, Formal analysis, Writing – Original draft preparation. AS, HH, RR: Writing – Review & Editing.

Declaration of Competing Interest

AS is an Associate Editor on the Editorial Board for Advances in Integrative Medicine. There are no other conflicts of interest to declare.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.aimed.2024.05.005.

References

[1] United Nations. Sustainable Development Goals Report. https://www.un.org/sustainabledevelopment/progress-report/.
[2] L. Barnes, L. Barclay, K. McCaffery, P. Aslani, Complementary medicine products used in pregnancy and lactation and an examination of the information sources accessed pertaining to maternal health literacy: a systematic review of qualitative studies, BMC Complement Alter. Med 18 (1) (2018) 229.
[3] World Health Organization, Meeting to develop a global consensus on preconception care to reduce maternal and childhood mortality and morbidity: World Health Organization Headquarters, 6–7 February 2012, Meeting report, Geneva, 2013.
[4] P.D. Gluckman, T. Buklijas, M.A. Hanson, Chapter 1 - The Developmental Origins of Health and Disease (DOHaD) Concept: Past, Present, and Future. In: Rosenfeld CS, ed. The Epigenome and Developmental Origins of Health and Disease, Academic Press, 2016, pp. 1–15.
[5] L. Poston, R. Caleyachetty, S. Cnattingius, et al., Preconceptional and maternal obesity: epidemiology and health consequences, Lancet Diabetes Endocrinol. 4 (12) (2016) 1025–1036.
[6] A.J. Taft, M. Shankar, K.I. Black, D. Mazza, S. Hussainy, J.C. Lucke, Unintended and unwanted pregnancy in Australia: a cross-sectional, national random telephone survey of prevalence and outcomes, Med. J. Aust. 209 (9) (2018) 407–408.
[7] Department of Health, Natl. Women'S. Health Strategy 2020-2030 (2019).
[8] The Royal Australian College of General Practitioners, Guidel. PreV. Act. Gen. Pract. Chapter V. 1. PreV. Act. Pregnancy (2018).
[9] E. Dorney, K.I. Black, Preconception care, Aust. J. Gen. Pract. 47 (7) (2018) 424.
[10] R. Oza-Frank, E. Gilson, S.A. Keim, C.D. Lynch, M.A. Klebanoff, Trends and factors associated with self-reported receipt of preconception care: PRAMS, 2004–2010, Birth 41 (4) (2014) 367–373.
[11] Commonwealth of Australia, Report of the Maternity Services Review, 2009.
[12] L.C. McKinnon, S.J. Prosser, Y.D. Miller, What women want: qualitative analysis of consumer evaluations of maternity care in Queensland, Australia, BMC Pregnancy Childbirth 14 (1) (2014) 366.
[13] K.P. Tully, A.M. Stuebe, S.B. Verbiest, The fourth trimester: a critical transition period with unmet maternal health needs, Am. J. Obstet. Gynecol. 217 (1) (2017) 37–41.
[14] M.K. Sijpkens, C.Z. van den Hazel, I. Delbaere, et al., Results of a Dutch national and subsequent international expert meeting on interconception care, J. Matern. Fetal Neonatal Med. (2019) 1–9, https://doi.org/10.1080/14767058.2018.1547375.
[15] A. Steel, E. McIntyre, J. Harnett, et al., Complementary medicine use in the Australian population: Results of a nationally-representative cross-sectional survey, 2018/11/23, Sci. Rep. 8 (1) (2018) 17325, https://doi.org/10.1038/s41598-018-35508-y.
[16] J. Wardle, A. Steel, E. McIntyre, Independent registration for naturopaths and herbalists in Australia: the coming of age of an ancient profession in contemporary healthcare, Aust. J. Herb. Med. 25 (3) (2013).
[17] A. Steel, J. Adams, D. Sibbritt, The Characteristics of Women Who Use Complementary Medicine While Attempting to Conceive: Results from a Nationally Representative Sample of 13,224 Australian Women, Women'S. Health Issues 27 (1) (2017) 67–74.
[18] A. Steel, J. Adams, D. Sibbritt, A. Broom, C. Gallois, J. Frawley, Utilisation of complementary and alternative medicine (CAM) practitioners within maternity care provision: results from a nationally representative cohort study of 1,835 pregnant women, BMC Pregnancy Childbirth 12 (2012) 146.
[19] A. Steel, H. Diezel, J. Wardle, J. Adams, Working with women: Semi-structured interviews with Australian complementary medicine maternity care practitioners, Women Birth (2019).
[20] A. Steel, J. Adams, D. Sibbritt, Developing a multi-modality complementary medicine practice-based research network: The PRACI project, Adv. Integr. Med. 1 (3) (2014) 113–118.
[21] A. Steel, D. Sibbritt, J. Schloss, et al., An Overview of the Practitioner Research and Collaboration Initiative (PRACI): a practice-based research network for complementary medicine, BMC Complement Alter. Med. 17 (1) (2017) 87.
[22] L.M. Rea, R.A. Parker, Designing and conducting survey research: A comprehensive guide, John Wiley & Sons, 2014.
[23] J.C. King, A summary of pathways or mechanisms linking preconception maternal nutrition with birth outcomes, J. Nutr. 146 (7) (2016) 1437S–1444S.
[24] Z.S. Lassi, A.M. Imam, S.V. Dean, Z.A. Bhutta, Preconception care: caffeine, smoking, alcohol, drugs and other environmental chemical/radiation exposure, Reprod. Health 11 (S3) (2014) S6.
[25] C.L. Harrison, W.J. Brown, M. Hayman, L.J. Moran, L.M. Redman, The role of physical activity in preconception, pregnancy and postpartum health, Thieme Medical Publishers, 2016, pp. e28–e37.
[26] C. Jacob, J. Baird, M. Barker, C. Cooper, M. Hanson, The importance of a life course approach to health: chronic disease risk from preconception through adolescence and adulthood, University of Southampton, *Southampton*, 2015.
[27] M. Barker, S.U. Dombrowski, T. Colbourn, et al., Intervention strategies to improve nutrition and health behaviours before conception, Lancet 391 (10132) (2018) 1853–1864.
[28] K.A. Johnson, R.E. Gee, Interpregnancy care, 2015/06/01/, Semin. Perinatol. 39 (4) (2015) 310–315, https://doi.org/10.1053/j.semperi.2015.05.011.
[29] D.A. Kennedy, A. Lupattelli, G. Koren, H. Nordeng, Safety classification of herbal medicines used in pregnancy in a multinational study, 2016/03/15, BMC Complement Alter. Med. 16 (1) (2016) 102, https://doi.org/10.1186/s12906-016-1079-z.
[30] G. Carson, L.V. Cox, J. Crane, et al., Alcohol use and pregnancy consensus clinical guidelines, J. Obstet. Gynaecol. Can. 32 (8) (2010) S1–S2.
[31] A. Steel, K. Martin, Fertility, preconception care and pregnancy, 3rd ed, in: J. Sarris, J. Wardle (Eds.), Clinical naturopathy: an evidence-based guide to practice, Elsevier, 2019, pp. 673–707, 3rd ed.
[32] A. Steel, J. Adams, D. Sibbritt, A. Broom, J. Frawley, C. Gallois, Relationship between complementary and alternative medicine use and incidence of adverse birth outcomes: an examination of a nationally representative sample of 1,835 Australian women, Midwifery (2014), https://doi.org/10.1016/j.midw.2014.03.015.
[33] A. Steel, H. Diezel, J. Frawley, J. Wardle, J. Adams, Providing maternity care from outside the system: perspectives of complementary medicine practitioners, J. Inter. Care (2020) 1–9.
[34] A. Steel, H. Hall, H. Diezel, J. Wardle, J. Adams, Filling the gaps in contemporary maternity care: The perceptions of complementary medicine practitioners providing care to women during pregnancy, Complement Ther. Clin. Pract. 34 (2019) 174–178.
[35] A. Steel, J. Adams, The role of naturopathy in pregnancy, labour and postnatal care: broadening the evidence-base, Complement Ther. Clin. Pract. 17 (2011) 189–192.
[36] Pope C, Mays N (Eds.), Qualitative research in health care, Wiley-Blackwell, 2020.
[37] R.M. Groves, Jr Fowler, FJ, M.P. Couper, J.M. Lepkowski, E. Singer, R. Tourangeau, Survey Methodology, 2nd ed, Wiley and Sons, 2011.
[38] J.W. Creswell, V.L.P. Clark, Des. Conduct. Mixed Methods Res. (2007).
[39] M. Verhoef, G.T. Lewith, C. Ritenabaugh, H. Boon, S. Fleishman, A. Leis, Complementary and alternative medicine whole systems research: Beyond identification of inadequacies of the RCT, Complement Ther. Med. 13 (2005) 206–212.
[40] B. Leech, J. Schloss, A. Steel, Health services research as a framework for expanding a whole systems research agenda in complementary and integrative medicine: The example of intestinal permeability, Eur. J. Integr. Med. 17 (2018) 22–25.
[41] R. Reid, A. Steel, J. Wardle, J. Adams, Naturopathic medicine for the management of endometriosis, dysmenorrhea, and menorrhagia: a content analysis, J. Integr. Complement Med. 25 (2) (2019) 202–226.
[42] World Naturopathic Federation Roots Committee. *WNF - Naturopathic Roots Report*. 2016. ⟨http://worldnaturopathicfederation.org/wp-content/uploads/2015/12/Naturopathic-Roots_final-1.pdf⟩.
[43] World Naturopathic Federation. *Global Naturopathic Regulation*. 2018. ⟨http://worldnaturopathicfederation.org/wp-content/uploads/2018/10/Global-Naturopathic-Regulation_finalb.pdf⟩.
[44] World Naturopathic Federation Education Committee. *Correlation between Education and Credentials*. 2018.
[45] J. Wardle, A. Steel, D. Casteleijn, D. Bowman, An evidence-based overview of naturopathic practice in Australia, Aust. J. Herb. Naturop. Med. 31 (1) (2019) 9.