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## ORIGINAL ARTICLE

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### Experiences and perceptions of newly graduated chiropractors from a South African university in their clinical management of pregnant women

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#### ABSTRACT

**Objective:** The study aimed to explore the experiences and perceptions of newly graduated chiropractors in the musculoskeletal management of pregnant women from our university in KwaZulu-Natal, South Africa.

**Methods:** A qualitative, explorative, descriptive research design was used. A purposive sample of 12 newly graduated chiropractors participated in semistructured interviews. The data were electronically stored, transcribed verbatim, and analyzed using thematic analysis.

**Results:** The participants expressed a lack of self-perceived confidence and knowledge, particularly regarding patients in their 3rd trimester. However, many graduates demonstrated an interest in treating pregnant patients and sought guidance from more experienced chiropractors. There was a notable desire for post-qualification enhancement with participants expressing the use of external resources, such as webinars and consultations, to refine their management strategies for pregnant women. Challenges with patient positioning, contraindications for spinal manipulation, and the need to develop trimester-specific treatment plans were key obstacles noted. New graduates emphasized the need for more comprehensive training on pregnancy-related issues within the chiropractic program. Overall, these findings highlight the need for enhanced educational chiropractic frameworks to better prepare chiropractors for the complexities of managing pregnant patients effectively.

**Conclusion:** Newly graduated chiropractors from our program felt underprepared due to limited practical training and exposure. Participants expressed a desire for enhanced practical experiences and specialized courses, emphasizing the need for curriculum improvements that bridge the gap between theoretical knowledge and practical application. The findings can assist in the development of a chiropractic program that better prepare graduates for managing pregnant patients.

**Key Indexing Terms:** Chiropractic; Education; Pregnancy

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#### INTRODUCTION

Chiropractic is a health profession that diagnoses, treats, and prevents mechanical disorders of the musculoskeletal system and evaluates their effects on the nervous system and overall health.<sup>1</sup> This holistic approach emphasizes noninvasive treatment methods, including soft tissue therapies, manipulations or mobilizations, exercises, and patient education.<sup>2</sup>

Pregnancy presents unique challenges to the musculoskeletal system due to significant physiological and anatomical changes.<sup>3,4</sup> These transformations often lead to conditions such as low back pain, pelvic girdle pain, carpal tunnel syndrome, and other neuromusculoskeletal disorders.<sup>5</sup> Chiropractic care has been explored as a treatment option for pregnancy-related discomforts with some studies suggesting potential benefits in alleviating pain, improving mobility, and enhancing daily functioning.<sup>6-8</sup> Chiropractors are trained to manage these

biomechanical changes and provide recommendations on physical activity, sleep, stress reduction, hygiene, and nutrition, thereby empowering pregnant women to maintain better health and well-being throughout their pregnancy.<sup>7,8</sup>

In the South African context, multiple risk factors complicate maternal health, including HIV/AIDS, alcohol misuse, malnutrition, and depression.<sup>9</sup> These factors are compounded by socioeconomic disparities and cultural barriers, such as language differences, which, in turn, challenge the delivery of effective maternal health care.<sup>10,11</sup> Given these complexities, chiropractic care offers a valuable, noninvasive therapeutic option for pregnant women. In South Africa (SA), chiropractors may refer patients to medical practitioners for medication or surgery when indicated, adhering to an interprofessional approach to health care.<sup>2</sup> Despite the benefits, evidence-based clinical research guiding chiropractic care during pregnancy remains limited.<sup>7</sup> It is critical to advance research in this domain to inform best practices

and enhance care standards. In SA, novice chiropractors face additional challenges due to the country's developing economy and widespread rural populations.<sup>11</sup> Limited resources and public service availability further exacerbate these challenges, underscoring the need for focused training and adaptive practice guidelines for newly graduated chiropractors.

Within the educational framework, the Durban University of Technology (DUT) incorporates training on managing pregnant patients into its chiropractic program. Students are introduced to pertinent topics, such as pregnancy-related musculoskeletal issues, prenatal and postnatal assessments, exercise, nutrition, and patient care strategies. This curriculum serves as an introduction and aims to equip future practitioners with the necessary knowledge regarding management of pregnant patients.<sup>12</sup> Accredited postgraduate chiropractic courses specializing in pregnancy are costly and are also not readily available in SA. Therefore, for most chiropractors in SA, the training and education that they receive, which is needed to treat pregnant women, is only obtained from a university setting.

Whereas self-perceived confidence is important for health care practitioners and impacts patient outcomes, new graduates often report anxiety and stress when entering practice.<sup>13</sup> Clinical education provided at institutions is a significant contributor for the development of skills and self-confidence, which are needed for the transition from student to capable practitioner.<sup>14</sup> However, the literature on this topic is limited in chiropractic education, and it is important to explore whether it is common for new graduates to feel uncertain in their abilities and if these feelings improve over time.

The qualitative experiences and perceptions of newly graduated chiropractors regarding their perspectives on their ability to manage pregnant women remain underexplored. Understanding these perspectives is vital for identifying educational gaps and enhancing chiropractic training programs to better address the needs of this patient population.<sup>15</sup> The research aimed to explore these experiences and perceptions, thereby contributing to the development of more robust educational frameworks and best practice guidelines for chiropractic care of pregnant women in SA.

## METHODS

### Research Design and Setting

The study used a qualitative, exploratory, descriptive design to investigate the experiences of newly graduated chiropractors in managing pregnant women. The research aimed to identify challenges and areas for improvement in management protocols. The qualitative design, particularly through semistructured interviews, allowed for a deeper understanding of personal perceptions and experiences. This direct personal experience allowed the researcher to interpret concepts and identify relevance and meaning from the collected data.<sup>16</sup>

The research was based in the province of KwaZulu-Natal, SA, more specifically in the eThekweni Metropolitan Municipality. The interviews were conducted over Microsoft Teams (Microsoft Corp) or in person at private practices between December 2022 and March 2023. Some interviews took place online because they were conducted during the COVID-19 pandemic.

### Sample

The study involved 12 newly graduated chiropractors from the DUT who had been practicing in the eThekweni Municipality

region for less than 5 years. Purposive sampling was used to select participants, who were identified through the Allied Health Professions Council of South Africa website, and with the help of the research supervisor, a final list of possible participants was constructed. Consent to participate was obtained telephonically and through email. The research was conducted at the participants' private practice or online. Data saturation was determined when the data showed consistent patterns, reached a limit in response diversity, and became saturated with depth.

Ethical approval was obtained from the institutional research and ethics committee of DUT (IREC 222/22). Prior to each interview, the participants read and signed the letters of information and consent, respectively. The participant's personal details were omitted from the transcripts and recordings to ensure confidentiality. Transcripts were only accessible by the researcher, supervisor, and cosupervisor.

### Data Collection and Analysis

Semistructured interviews with participants, ranging from 15 to 30 minutes, were conducted. The interview guide was adapted from Frederick, Varatharajulu, and Sibiya.<sup>17</sup> A pilot study was conducted to test the research questions, and feedback was used to develop the interview guide. Participants were informed of the study's context and purpose and given a letter of information and consent. Confidentiality was maintained, and participants could withdraw at any time. Audio recordings were made with permission, and participants were given codes to ensure confidentiality. Eight research questions (Fig. 1), including probing questions to facilitate the discussion, were asked of the participants. No significant differences were observed between online and in-person interviews, ensuring consistency. All participants were questioned in a similar manner, no matter the platform on which the interview took place. All participants were probed and given enough time to speak. All online interviews were conducted with the video on to mimic an in-person interview environment. The data were electronically stored and transcribed verbatim by the researcher.

The researchers used the Tesch method for thematic analysis to identify common themes among participants' responses, comparing and contrasting various approaches to the phenomenon.<sup>16</sup> The data was transcribed verbatim after listening to audio recordings, rechecked for accuracy, and coded to identify categories and subcategories. The researcher used themes and subthemes to interpret the coded data. The supervisors who are experts in qualitative research were used as independent coders who critiqued the emerged themes. Conclusions were then formulated.

### Trustworthiness

Trustworthiness in research involves measures such as credibility, dependability, conformability, and transferability.<sup>18</sup> Credibility was achieved through issuing consent letters, collecting data until saturation, and coding transcripts for deidentification. Co-analysis between researchers and supervisors was also used. Supervisors guided the study and data collection, and analysis was completed by the researcher with the supervisors checking to see if it was transcribed and analyzed correctly in keeping with the principles of qualitative research.<sup>18</sup> Dependability was achieved by tracking research design and keeping an audit trail. Influences on data collection and analysis were also recorded.<sup>18</sup> Conformability was achieved by maintaining objectivity through

Interview Guide Date _____ Participant no: _____
<b>SECTION A: DEMOGRAPHIC DATA</b> Age _____ Gender _____ Highest qualifications _____ Post graduate study _____ Institution from which participant graduated and year of graduation _____ Number of months/years participant has been in practice after graduation _____ Approximate number of pregnant women treated _____
<b>SECTION B: INTERVIEW QUESTIONS:</b> 1. What are your perceptions, with regards to management of pregnant women? Probe: Do you feel adequately prepared and confident to manage a pregnant patient? If not, please elaborate. 2. Do you feel, as a newly graduated chiropractor, that you are adequately knowledgeable in order to diagnose a pregnant patient? Probes: Do you feel that you are well enough informed regarding diseases and disorders related to pregnancy and are able to identify the nature of a medical condition by examination of the symptoms? Do you continue to read current literature, pertaining to management of pregnant women to keep you informed on the current protocols for chiropractic pregnancy management? 3. Would you be interested in attending a post-graduate course addressing pregnancy? Please elaborate. Probe: Do you think attending a course specifically designed to equip you with the skills, knowledge and overall efficiency when managing pregnant patients, will be of benefit to you, taking into account, the cost and availability of the course, with most courses being available only outside of South Africa or online. 4. Do you feel that you fully understand when to manage a pregnant woman yourself and when you should refer to other health care specialists? Probe: As a newly graduated chiropractor, without years of extensive interaction with pregnant women, is it apparent when you should facilitate treatment plans to assure medical care is provided to the patient and when to transfer the patient to another health care specialist e.g. a gynaecologist? Do you think that you can easily recognise a 'Red Flag' pregnancy case? 5. Describe the most challenging aspects, regarding pregnant patient treatment and management. Probe: Can you relate any instances of difficult elements, which you have encountered in private practice, during the consultation or facilitating treatment protocols to pregnant patients? 6. What aspects, if any, would you want to improve in your management of pregnant women? Probes: What elements, pertaining in particular to your provision of diagnostic and therapeutic services, do you desire to enhance, when managing pregnant women? Elaborate on the aids, that you could utilise to do so. 7. In your opinion, what do you think was the most useful aspect, that you learnt regarding pregnancy in chiropractic, that has helped you manage or treat pregnant patients in private practice? Probes: Elaborate on the theoretical grounding and clinical experience that has assisted you to provide adequate care to pregnant women? Were there any additional sources of information that you found useful regarding pregnancy, during your chiropractic course? 8. Are there aspects, that you suggest the chiropractic pregnancy programme incorporate or adjust, to improve the quality of education surrounding pregnant women and therefore care of these patients? Probes: What elements do you feel, can be introduced or omitted from the chiropractic pregnancy course in order to facilitate a better understanding and greater knowledge of pregnant women? Do you feel that the chiropractic pregnancy programme has adequately prepared you to handle and treat these patients? How do you think your experience in the programme could have been maximised or enhanced?

**Figure 1** - Interview guide adapted from Frederick, Varatharajullu, and Sibiya.

accountability through an audit trail, reflexivity by the researcher, and scrutiny by the supervisors.<sup>18</sup> Transferability was accomplished by providing detailed information about research processes, procedures, and context through issuing a letter of information.<sup>18</sup>

## RESULTS

### **Participant Demographics**

The participants ranged in age from 26 to 35 years. Of the 12 individuals interviewed, 4 identified as female and 4 as

male. Participants were asked to report on the duration of their experience in private practice, which ranged from 7 to 60 months. The number of pregnant patients treated by each graduate also varied significantly with 1 participant having treated a single pregnant patient, whereas another reported having treated approximately 150 to 200 pregnant patients at the time of the interview. The themes and subthemes that emerged from the analysis of the interviews are presented along with excerpts from the transcripts to support the results.

### **Theme 1: Self-Perception of Competence, Confidence, and Knowledge in Managing Pregnant Patients**

#### **Self-Perceived Confidence in the Management of Pregnant Patients in Different Trimesters**

The majority of participants expressed a lack of self-perceived confidence when managing pregnant patients in their 3rd trimester: “The 3rd trimester I am least confident in. First and second, I would say I am more confident in in treating. . . I feel like there is a lack of practical skill, like for me personally. That’s why I feel, and you have to also be more cautious. . .” (P#6)

Another participant (8%,  $n = 1$ ) voiced a similar opinion but attributed a gain in confidence following a consult with a more experienced chiropractor:

Initially. . .there was always no confidence, but because you went out of DUT. But with colleagues being around always, which is nice to have. Like we have [name removed], who gave us a lot on treating people in certain ways. I’ve always been knocking on her door just to confirm that’s the way it should be.—P#2

#### **Interprofessional Relationships and Referrals to Other Health Care Practitioners**

Seventy-five percent ( $n = 9$ ) of participants communicated that they referred pregnant patients to other health care specialists if they presented with anything other than musculoskeletal conditions or if they detected any concerning or sinister symptoms:

The only thing that would make me refer them is if the problem was not chiropractic, so if it was not musculoskeletal maybe it’s something else like causing the lower back pain rather than musculoskeletal pain or if it’s complicated case or have red flags then I would refer.—P#3  
I think I only manage or did manage when it is just musculoskeletal-like related. So yes, with muscular pain, joint restrictions things like that, but definitely when it gets more systemic, I would refer out because they would definitely need more management with regard to that.—P#7

#### **Perceived Efficacy of Chiropractic Care of Pregnant Women**

All participants (100%,  $n = 12$ ) expressed that chiropractic care during pregnancy was essential for optimal maternal health and well-being, which assisted in promoting an overall better pregnancy and easier delivery of the baby:

I had an incredibly short labor, which I can only put that down to chiropractor care—a healthy pregnancy—I think

there is that and I see it in practice time and time again. . . They do a lot better when they come consistently—P#1  
Chiro is actually amazing with pregnant individuals. The thing is many people. . .years ago didn’t know that you could get physical help for musculoskeletal conditions for pregnancy. It was always. . .“Aah, you have to go to your GP,” and here are some pain killers, etc. But just from the patients that I have treated, they’ve had amazing results. Even other chiros. I’ve observed chiros through my observation time. . .those patients that used to come to those chiros they felt relief.—P#9

#### **Self-Perceived Levels of Confidence Influencing One’s Desire to Manage Pregnant Women**

With more patient exposure and experience, 58% ( $n = 7$ ) of participants felt confident in managing pregnant patients. Despite varying confidence levels, the participants were still of the opinion that they were able to manage and treat pregnant women:

I wouldn’t say I am 100% confident. Okay like I say, I personally feel I would need to do an extra course in pregnancy to feel 100% confident. But with that being said, do I feel as though I can manage and treat a pregnant patient alone? Yes.—P#6  
Okay, initially it was around—I’m talking back when I started—it was maybe a 6.5 but now I would say it’s around a 7.5 or 8. Why I say 6.5 back then was because I obviously was not exposed to many pregnant patients back in clinic. So going from clinic to private practice and having patients come in was a new thing. . .—P#9

Contrary to this, a participant (8%,  $n = 1$ ) graded herself as highly confident: “Pretty confident, with all my extra research, courses and exposure I’ve had throughout the years” (P#1).

#### **Self-Perceived Deficits in Knowledge Pertaining to the Chiropractic Management of Pregnant Women**

Only 3 (25%) participants deemed themselves uncertain with 1 or more areas of treatment and management of pregnant women: “When it came to the pelvis and the pubis, I was not confident there, but I wasn’t sure what to do and how much we can do and how long we can actually book in that area, so I didn’t feel confident there” (P#5).

However, the majority of the participants believed that there was little to nothing that they felt uncertain about regarding the subject of musculoskeletal pain management of pregnant patients:

Not really. When it comes from musculoskeletal and our kind of manual therapy that we are using. Because I think like leaving DUT and the exposure. Even with all that stuff that like comes after like all the webinars and stuff with all that exposure are out there—I don’t think there is any deficit. But obviously if you are going to go in-depth, and into a pregnancy and paed’s kind of short course—then there will be more because there is always more to learn.—P#7

### **Theme 2: Post-Qualification Enhancement in Pregnant Patient Management**

#### **Self-Teaching Postgraduation**

Eighty-three percent ( $n = 10$ ) of the participants used multiple sources of information such as electronic journal articles



and informative magazines, chiropractic seminars and observations, or consultations with other chiropractors: “I think just basically reading articles and looking at decent publish articles, webinars that CASA offers even Paeds SA—they always have webinars that keep us like updated” (P#6).

Another said, “I attend webinars that are hosted by CASA and sometimes I read online articles about different ways of managing these patients which I find helpful” (P#12).

### **Additional Sources of Information Used to Facilitate Greater Knowledge During the Chiropractic Course**

Mixed responses were obtained from participants. Fifty percent ( $n = 6$ ) of participants reported no additional sources other than the structured coursework, journal articles, and notes provided as a result of the academic year being demanding: “During that year, I didn’t have the time to go look for extra things but being in practice I have” (P#6).

The other half of the participants (50%,  $n = 6$ ) reported utilization of additional sources of information, mainly in the form of websites, notes from past-year students, and chiropractic seminars: “Google search and MedPages” (P#2).

### **Cost and Availability of Courses Addressing Chiropractic Management of Pregnant Women**

All participants (100%,  $n = 12$ ) expressed interest in attending a postgraduate course on chiropractic management of pregnant patients with cost and availability being major factors in their decision. Most participants preferred courses with an equal practical and theoretical base, indicating a strong preference for such courses:

If it costs a lot, that would determine, but if it is good value for money then I would, and it all depends on the quality as well. For me, it will come down to if I have to miss work to attend or not.—P#3

The cost wouldn’t matter. I would be fine investing in it, but availability is the issue. I would prefer in-person. Like I said, it would be easier to read up and watch webinars, but I want experience. Like I want someone to sit there with me and teach me like you would in-person.—P#5

### **Continuation of Professional Development in Pregnant Patients**

Only 2 (17%) participants have completed further qualifications and postgraduate courses in chiropractic management of pregnant women. Both participants completed courses external to SA: “I am a certified Webster practitioner with ICPA and I’ve done a lot of courses with Mike Marinus” (P#1).

### **Theme 3: Obstacles Encountered in the Management and Treatment of Pregnant Patients**

#### **Difference in Management Styles Between Pregnant and Nonpregnant Patients**

All participants (100%,  $n = 12$ ) felt that, in the initial stages of pregnancy, the patients presented similar to nonpregnant patients. The restricted use of modalities such as dry needling and patient positioning being common considerations:

With pregnant patients, you must take into consideration positions. Nonpregnant you can just have them on. . . you can put a little bit more extra force into them like when you ischemic you can use a little more pressure, and adjustments a little bit more, but obviously with pregnant individuals you’ve got to like take a little consideration. Obviously, with pregnancies you are going to put them almost into a lateral recumbent, so you don’t really give them extra torsion. You can obviously needle more on nonpregnant individuals compared to nonpregnant individuals.—P#9

**Restrictions and Limitations in the Type of Treatment** A few participants mentioned that patient vulnerability, patient compliance, restrictions in complementary modalities, adaptations to the styles of adjustments, and limited knowledge influenced the type of treatment for a pregnant patient:

It’s just certain things that I can’t do so the positions and style of adjustments obviously using less force and less certain things that I won’t do especially in the 3rd trimester with patients, especially lumbar rolls and things like that and also be aware of the position they are in. Especially in the 3rd trimester, you don’t want them on their back too much, you also don’t want them on their stomach for complications.—P#3

Another said, “From studies, you not allowed to use electromodalities around the area” (P#9).

### **Considerations When Managing Pregnant Patients**

Eighty-three percent ( $n = 10$ ) of participants expressed that patient education was essential. The importance of being cautious and gentle was also mentioned, emphasizing the need for careful handling: “I think I probably spend a 3rd of a session on patient education for the degree of pregnant women and the pre- and post-partum as well” (P#5).

A majority of the participants stated that the most challenging region to perform spinal manipulation on was the low back: “On the lower back, yes you do get a bit weary at times just because it’s such a fragile and sensitive area” (P#7).

Another said, “The only area though that is difficult to perform spinal manipulation is the lower back” (P#12).

### **Ability to Recognize and Diagnose Red Flags in Pregnancy**

Participants deemed that they could identify and diagnose red flags in pregnant patients and would then refer them to a health care specialist: “I would be able to identify obvious red flags in a pregnant lady. And then thereafter, I would potentially refer if I feel that it’s beyond my scope” (P#6).

### **Theme 4: Education and Training Acquired in the Chiropractic Program**

#### **The Exposure of Students to Pregnant Patients During the Clinical Training**

Seven participants (58%) had the opportunity to treat and manage 1 or more pregnant patients. They deemed this very advantageous as they were able to receive guidance through the process. There was a generalized lack of exposure of students to pregnant patients during the clinical training period: “It did help me a lot because there were clinicians to guide me

with what to do. So, from that experience, it's what I'm using now in private practice" (P#12).

### Preparedness in Terms of Education as a Determinant of Preparedness

All participants (100%,  $n = 12$ ) believed the chiropractic pregnancy module alone did not adequately prepare them to handle and treat pregnant patients:

I want to say it has given us the basic knowledge that we need. Okay, but I don't think it has been very in depth, and I kind of wish there was more of a practical component to it, especially with regard to adjustments and the various different things to look out for and how to best manage a patient.—P#6

No, I don't. I feel there was a moderate amount of theoretical work—not even a module. There was quite a light amount of theory of pregnant patients. But on actual ways to adjust them, treat them and alternatives you can use as opposed to a nonpregnant patient; I feel was quite insufficient.—P#8

What we were taught on campus or in our syllabus, it wasn't really adequate. We had to obviously do research and watch courses to understand more. But I don't think what I learnt on campus was adequate enough for treating pregnant individuals. It is obviously what I tried to do outside of campus mixed with other pregnant chiropractors that taught us new stuff.—P#9

### Beneficial Aspects Learnt During the Chiropractic Pregnancy Course

Ten participants (83%) were of the opinion that their theoretical grounding received during the pregnancy course was most useful in the provision of development of diagnostic skills and formed a theoretical groundwork for generalized management of pregnant patients:

I think the background knowledge. Like knowing the different stages—what to expect from the moms and what they present with and how to handle that. Nutrition. All of that really did help. It was like a manual that you can compare and refer to it. Like is this mom on track.—P#7

It was the first thing I learnt. It's useful in that way; it introduced me to the topic. Actually, you don't learn how to treat a patient in pregnancy and paediatrics—you learn how a patient presents.—P#11

Discontent was voiced by 1 (8%) participant regarding the limited content and scarcity of the practical component: "All the theory that was learnt was obviously helpful. It's just that you need practical experience to give you the confidence to treat with it" (P#3).

### Recommended Areas of Improvement in the DUT Chiropractic Pregnancy Course

An early introduction to pregnancy care and more practical exposure was a popular suggestion among 75% ( $n = 9$ ) of participants: "Just the practical aspect" (P#6). "I think the biggest thing is the practical part of it..." (P#7). "I think there should be a practical component if there isn't. Because I...we didn't have any" (P#12). "I'm not fully comfortable with

making an elective such a short period of time. Especially when that's what you want to do it or make your practice focused on that. Not everyone has the money to further study, so you have to make it worth their while" (P#11).

One participant (8%) strongly suggested that the module be taught by various lecturers with additional qualifications and interest in this field:

I think that whole subject needs to change. I don't think it can be the same person lecturing the same thing over and over again. I think people that are specialized in that field need to be called in to do guest lectures for that space, and there are people that can do that.—P#11

## DISCUSSION

This study explored the experiences and perceptions of newly graduated chiropractors from DUT regarding their management of pregnant patients. The findings highlighted differences between the theoretical framework of the chiropractic education on managing pregnant women and the practical realities experienced by these practitioners. The discussion also provides broader implications for health care training generally. These findings warrant a deeper examination of how to effectively bridge the gap between educational preparation and real-world application, particularly for specialized population groups, such as pregnant women.

Emphasis can be drawn to the critical deficit in the self-perceived confidence reported by newly graduated chiropractors when handling challenges involved in treating pregnant patients. This result aligns with findings across various health care professions, in which new graduates frequently express feelings of uncertainties about their clinical skills and decision-making capabilities.<sup>13,19</sup> It can be noted that research within the medical and nursing disciplines shows that self-perceived confidence is influenced by direct clinical exposure and hands-on experience.<sup>13,19</sup> Therefore, there is a need for chiropractic education to reevaluate its approach to practical exposure, especially for specialized domains such as maternity care.

A contributing factor to this lack of preparation expressed by the graduates appears to be insufficient exposure to pregnant patients. The participants expressed that the limited interaction subsequently affected their ability to develop confidence in treating this population group. Globally, health care education models have recognized the importance of varied, real-world patient interactions and have integrated innovative training approaches that allow students to navigate and respond to a variety of clinical situations. An example includes the usage of emerging technologies, such as virtual reality, to create clinical simulations that create safe learning environments in which students can practice their skills without potential risks.<sup>20</sup> By incorporating such technologies into training, chiropractic institutions could develop students' preparedness to face the complex challenges associated with managing pregnant patients or other specified population groups.

Ethical dilemmas surrounding access to pregnant patients in South African communities suggest a need for better public awareness and understanding of the role that chiropractic treatment plays in maternal health. Campaigns that raise awareness may be useful in public perception and engagement regarding chiropractic interventions.

The study emphasized the importance of interprofessional collaboration and understanding. A majority of the participants reported engaging in multidisciplinary teams. Enhanced communication skills among health care providers is emphasized, and their integration into training programs has been advocated for to improve patient outcomes.<sup>21,22</sup> Interprofessional collaboration improves teamwork, patient care, and health care utilization, especially for complex patients as it was similarly reported by the participants.<sup>23,24</sup> In addition, participants noted that consultations with more experienced chiropractors greatly bolstered their confidence. Therefore, chiropractic programs may consider cultivating a culture of interprofessional education to enrich students' professional perspectives and their approach to patient care. Collaboration could be achieved by fostering joint educational opportunities alongside nursing, midwives, and medical students, creating a learning environment that mirrors real-world health care scenarios.<sup>25</sup> Exposure to diverse health care professionals allow opportunities for chiropractic students to appreciate the multifaceted roles within a health care team while developing their abilities to work effectively in collaboration. Implementing these strategies could benefit both student training and patient care outcomes.

Increased engagement time and better instructional quality has been found to promote confidence among graduates.<sup>26</sup> Greater learning engagement leads to improved understanding and retention of material. As expressed by the participants, there is a suggestion for the chiropractic module addressing the management of pregnant patients to reconsider its structure and pacing. The participants expressed that an extended pregnancy management course with increased contact hours and comprehensive instruction from experienced practitioners in the field may be beneficial. Adopting these recommendations may better equip our future chiropractors with the skills and confidence necessary to tackle the challenges of managing pregnant patients. Innovative teaching strategies enable active learning and authentic engagement with the material.<sup>27</sup> By moving away from traditional lecture formats toward more interactive, student-centered learning techniques, our university can create learning environments that encourage critical thinking and foster real-world application of knowledge. This could improve learners' overall experience, especially when the end goal is to produce competent practitioners who can confidently manage their patients' unique challenges.

The findings highlight the potential need for international attention to the chiropractic curriculum. Chiropractic education varies significantly across some countries. An emphasis on establishing universally recognized guidelines for managing diverse patient populations, such as pregnant women, could enhance the legitimacy and efforts of the chiropractic curriculum globally. This allows institutions to offer training that is not only modernized but also aligned to the evolving needs of health care.<sup>28,29</sup>

New graduates expressed eagerness to improve their self-perceived competence in managing pregnant patients. The lack of specific postgraduate courses led them to rely on self-teaching, including webinars, peer-reviewed journals, and consultation with experienced chiropractors. Chiropractors have a positive attitude toward research but often lack confidence in their research skills.<sup>30</sup> It is important to participate in lifelong learning and flexibility in education to meet the

demands of the evolving medical field.<sup>31</sup> Institutions should enable self-directed learning through innovative tools and provide continuous professional training programs.<sup>32</sup> Participants disclosed mixed usage of additional learning resources during their studies with some citing time constraints as a barrier. Studies have found that supplementary sources enhance self-learning and examination preparation.<sup>33,34</sup> Encouraging the use of credible print and online sources, granting easier access to databases, and promoting open-access resources can significantly enrich student learning experiences.

Participants unanimously felt that postgraduate courses would enhance their skills, but these come with high costs and limited availability in SA, and these were seen as significant barriers. Cost, content control, convenience, and personal development were identified as critical factors influencing the uptake of continuing education programs.<sup>35</sup> Stakeholders should work toward making specialized courses more accessible and affordable to support continuous professional development. Only a few participants pursued further qualifications, primarily from international sources. Post-professional specialist training, such as pediatrics or sports, is essential for chiropractors who have tailored their practice toward specific patient populations.<sup>36</sup>

### Limitations

The study examined newly graduated chiropractors from the DUT chiropractic program in eThekweni Municipality between 2017 and 2023. The perspectives and experiences of these chiropractors may differ from those from other universities. Nevertheless, the findings may be helpful for curriculum evaluations, lecturing, and future pregnancy-focused outreach programs. It must be noted that the study did not evaluate the actual levels of expertise of newly graduated chiropractors in managing pregnant women. Therefore, it is possible that the perceptions of newly graduated chiropractors may not accurately reflect their level of proficiency in this area. The conclusions should not be generalized, and caution is advised when interpreting the findings.

The reader should note that, although the participants expressed feelings of unpreparedness, this may be due to the natural or expected process of a new graduate. A possible scenario to consider is that the participants who expressed these concerns may have treated only a few pregnant patients, and with a longer time in practice and the more patients to which they are exposed, their self-perceived confidence levels may improve.

### CONCLUSION

This study reveals a gap between our newly graduated chiropractors' self-perceived theoretical knowledge and practical competence in managing pregnant women. Whereas participants recognized the importance of maternal health and demonstrated appropriate referral practices, many participants expressed limited self-perceived confidence due to limited clinical exposure during training. Recommendations for curriculum improvements include extended pregnancy-related modules, increased hands-on experience, and incorporation of exposure to specialized clinics. Greater interprofessional collaboration and integration of emerging technologies, such as clinical simulations, may further enhance student preparedness.



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## Author Contributions

Concept development: TS, MNS, DV. Design: TS, MNS, DV. Supervision: MNS, DV. Data collection/processing: TS. Analysis/interpretation: TS. Literature search: TS. Writing: TS, MNS, DV. Critical review: MNS, DV.

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