

**Risk factors for pelvic floor dysfunction and women's experience of
accessing information, diagnosis, and treatment of pelvic floor
dysfunction in the postnatal period in New Zealand**

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Abstract

Introduction

Pelvic floor dysfunction is a debilitating set of symptoms, which predominantly impacts women. These symptoms often arise at a particularly vulnerable time for women after the birth of their child. However, there has been very little research into the prevalence of pelvic floor dysfunction in New Zealand or women's experience of symptoms after the birth of their child. This research focuses on the underlying risk factors for the development of pelvic floor dysfunction and provides a greater understanding of women's experience of pelvic floor dysfunction in the year after birth. The research has two research questions: how is the mode of delivery (childbirth) and associated pelvic floor trauma (perineal tears) changing in New Zealand; and what are the experiences of women with pelvic floor dysfunction within the postnatal period (one year after birth) in accessing information, diagnosis, and treatment for their symptoms?

Methodology

A convergent mixed method design underpinned by pragmatism was used to answer both research questions. First, a retrospective descriptive study using data from the National Maternity Collection within the National Minimum Dataset and the Sexual Reproductive Health Module of the New Zealand Health Survey 2014/15 was used to answer the first research question. Descriptive and regression analyses were used to analyse the results. Secondly, individual interviews with postnatal women and key informant health professionals were conducted to answer the second research question. Thematic analysis using qualitative description was used to analyse the interview transcripts.

Results

The results from the quantitative phase of the study showed that women are having more intervention in their births, with increasing numbers of caesarean sections and assisted deliveries over time. The rates of perineal tears are also increasing in number and severity. Prevalence of urinary incontinence is high in the female population, with 43.5% of women experiencing some form of symptoms. Women who have been pregnant are three times more likely to experience urinary incontinence in their lifetime.

The qualitative phase of the study concludes that women with symptoms of pelvic floor dysfunction have a very poor experience of accessing information, diagnosis, and treatment of their symptoms within the year after birth. Women's symptoms were normalised and dismissed with multiple other barriers in place to accessing appropriate treatment.

Discussion

The changing mode of delivery and the rising number and severity of perineal tears in New Zealand women, in addition to the growing aging population, is likely to result in an increasing prevalence of pelvic floor dysfunction symptoms amongst New Zealand women. There is a risk that if the New Zealand maternal health system does not adapt to better support postnatal women with pelvic floor dysfunction, more women will suffer poor quality of life and poorer health outcomes as they age. The current study highlights significant, avoidable gaps in perinatal health service provision, which is based on a specialised model of care, not suitable for a highly prevalent health issue for women. This research recommends better pelvic floor information resources for women, pelvic floor training for health professionals involved in perinatal care, improved public pelvic physiotherapy services, a six-week postnatal primary care check-up, and finally tackling the normalisation of pelvic floor dysfunction.

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Glossary

Word or term	Description
Spontaneous vaginal delivery	Birth of a baby without obstetric delivery assistance
Assisted delivery	The use of instrumental interventions (ventouse, forceps) to assist vaginal birth
Caesarean section	Operative birth through an abdominal incision, which includes emergency and elective
Perineal tear	Perineal laceration during birth
First degree perineal tear	Injury to perineal skin and or vaginal mucosa
Second degree perineal tear	Injury to perineum involving perineal muscles but not involving the anal sphincter
Third degree perineal tear	Injury to perineum involving the anal sphincter complex
Fourth degree perineal tear	Injury to perineum involving the anal sphincter complex and anorectal mucosa
Perinatal period	Pregnancy to one year after birth
Postnatal/Postpartum period	The one-year period after birth
Parous women	A woman who has given birth to one or more children

Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor used artificial intelligence tools or generative artificial intelligence tools (unless it is clearly stated, and referenced, along with the purpose of use), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning

29.01.2025

Signature

Date

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Chapter One – Introduction and background

A healthy, functioning pelvic floor is fundamental to women's physical and psychological wellbeing, and therefore their ability to engage in society, family life, intimate relationships, and physical exercise. Pelvic floor dysfunction is a debilitating set of symptoms, which predominantly impacts women. Despite the importance of pelvic floor health, pelvic floor dysfunction is endemic internationally and under-researched in Aotearoa, New Zealand (New Zealand). Pelvic floor dysfunction symptoms often arise at a particularly vulnerable time for women after the birth of their child. However, there has been very little research into the prevalence of pelvic floor dysfunction during the postnatal period or women's experience of symptoms after the birth of their child in New Zealand. This research will focus on the underlying risk factors for the development of pelvic floor dysfunction and provide a greater understanding of women's experience of pelvic floor dysfunction in the year after birth. This introductory chapter will state the research aims and questions, provide a background to the issue, outline the practical implications of the research, and lay out the thesis structure.

The research aims and questions

The purpose of this research is to answer the following research questions:

1. How is the mode of delivery (childbirth) and associated pelvic floor trauma (perineal tears) changing in New Zealand?
2. What are the experiences of women with pelvic floor dysfunction within the postnatal period (one year after birth) in accessing information, diagnosis, and treatment for their symptoms?

First, the study aims to quantitatively understand the changing mode of delivery practice in New Zealand, the trauma sustained to the pelvic floor through perineal tears, quantify the prevalence of known urinary incontinence, and estimate how these changes may impact the

likelihood of overall pelvic floor dysfunction prevalence. Subsequently, the second aim of this study is to explore women's experience with pelvic floor dysfunction symptoms within the postnatal period, including how they access information, diagnosis, and treatment for it.

Background and rationale

The pelvic floor is a group of muscles and supportive tissues that hold the pelvic organs in place. If these muscles or supportive tissues weaken or are injured, symptoms of pelvic floor dysfunction can be experienced (National Institutes of Health, 2020). Pelvic floor dysfunction is usually grouped into the three most common symptoms: urinary incontinence, faecal incontinence, and pelvic organ prolapse (Dieter et al., 2015; Nygaard et al., 2008). Although men and women can experience pelvic floor dysfunction symptoms, the prevalence is significantly lower in men (MacLennan et al., 2000). The recommended course of treatment for pelvic floor dysfunction ranges from lifestyle changes, pelvic floor muscle training, intravaginal devices, medicines, and surgical interventions (NICE, 2019, 2021a).

Pelvic floor dysfunction is fundamental to women's physical and psychological wellbeing, with international evidence reporting that pelvic floor dysfunction symptoms have a negative impact on quality of life. Molina et al. (2023) found that women with pelvic floor dysfunction reported worse quality of life in all dimensions, which included physical, emotional, mental health, general health, and pain (Molina et al., 2023). Contributing to poorer quality of life, women with pelvic floor dysfunction are three times more likely to have depression than those without pelvic floor dysfunction symptoms, thus highlighting the impact of pelvic floor dysfunction on their mental health (Mazi et al., 2019). Pelvic floor dysfunction symptoms are known to cause women to retreat from society, lose their sense of sexuality and sense of self, and be overcome by embarrassment and shame, all leading to poor quality of life and psychological distress (Toye et al., 2023). In addition to poorer quality of life, pelvic floor dysfunction symptoms have a long-term impact on women's health

outcomes. For example, it is estimated that at least 20% of women will have to undergo surgery to treat pelvic floor dysfunction over their lifetime (Dieter et al., 2015).

International research has established that there is a high prevalence of pelvic floor dysfunction in the female population. MacLennan et al. (2000) found that 46% of women surveyed in South Australia had experienced some form of pelvic floor dysfunction symptoms. Within the USA, the reported prevalence of experiencing at least one symptom of pelvic floor dysfunction ranged from 9.7% of women aged between 20-39 years and increased to 49.7% of women aged 80 and over (Nygaard et al., 2008). Studies have predicted that the prevalence of pelvic floor dysfunction symptoms within the female population is likely to grow due to the aging population (Luber et al., 2001; Wu et al., 2009). There has not been any literature identified that measures the prevalence of pelvic floor dysfunction symptoms in New Zealand, but the prevalence of pelvic floor dysfunction in New Zealand is likely similar to comparable countries such as the USA and Australia.

Although similar, New Zealand has a unique society, with a diverse population. In the latest census in 2023, although those identifying as European ethnicity remain the largest ethnic group at 67.8%, people identifying as Māori (17.8%), Asian (17.3%), and Pacific Peoples (8.9%) have all increased their share of the total population (Stats NZ, 2024). Most importantly, New Zealand's indigenous Māori population experience higher rates of morbidity and mortality, leading to shorter life expectancy. In addition to wāhine Māori experiencing poorer health outcomes and shorter life expectancy, they experience higher levels of socioeconomic disadvantage than non-Māori women, which contributes to their poorer health outcomes (Ministry of Health, 2023). The New Zealand Crown has obligations under Te Tiriti o Waitangi to achieve equitable health outcomes for Māori (*Pae Tū*, 2023). Therefore, it is important that research is conducted in New Zealand to capture the unique diversity of the population, uphold the obligations under Te Tiriti o Waitangi and, in the case of this research, uphold the mana of wāhine Māori.

Pregnancy is associated with a higher risk of pelvic floor dysfunction

Pregnancy and birth had been strongly associated with pelvic floor dysfunction symptoms, with different modes of delivery impacting the likelihood of symptoms (Blomquist et al., 2018; Handa et al., 2012; MacLennan et al., 2000; Nygaard et al., 2008). Studies have shown that pelvic floor dysfunction symptoms are highly prevalent within the year after birth, with Palmieri et al. (2022) finding that 43% of women in the early postpartum period (six to 10 weeks post-birth) experience symptoms. Symptoms remain prevalent at one year postpartum, with Nygaard et al. (2020) finding that 54.2% of women who gave birth vaginally had pelvic floor dysfunction symptoms.

Mode of delivery is associated with pelvic floor dysfunction symptoms

A women's mode of delivery is associated with pelvic floor dysfunction. Women who have had a vaginal delivery (assisted or non-assisted) are more likely to experience pelvic floor dysfunction than those who have had a caesarean section, with women who had an assisted vaginal delivery having the highest likelihood of symptoms (Blomquist et al., 2018; Handa et al., 2011; López-López et al., 2021). A longitudinal cohort study reviewed women's pelvic floor dysfunction symptoms between five and 10 years after their first delivery, and found that those who had a vaginal birth were five times more likely to have pelvic organ prolapse and nearly three times more likely to have urinary incontinence than those who had a caesarean section. Assisted vaginal delivery increased these odds further to over seven times more likely to experience prolapse symptoms than for women who had a caesarean delivery (Handa et al., 2011)

Maternal age and BMI are associated with mode of delivery

Advancing maternal age is associated with an increased likelihood of caesarean section than spontaneous vaginal birth (Hochler et al., 2023; Kean et al., 2020; Sharami et al., 2022). Older women are also more likely to experience an assisted delivery than younger women (Herstad et al., 2015; Schreiber et al., 2024; Wang et al., 2011). In addition to age, Body Mass Index (BMI) is associated with mode of delivery, specifically a higher BMI has been associated with an increased risk

of caesarean section (Kominiarek et al., 2010; Pavlidou et al., 2023; Pettersen-Dahl et al., 2018). Pettersen-Dahl et al. (2017) analysed the obstetric data of 8821 women and found that compared to women with a normal BMI, those with a BMI over 30 (independent of whether they had given birth before) had an increased likelihood of caesarean delivery than spontaneous vaginal delivery (Pettersen-Dahl et al., 2018). There is limited international literature on any association between assisted delivery and BMI.

Mode of delivery is associated with perineal tears

Perineal trauma is very common after vaginal childbirth, with nine out of 10 women sustaining some form of perineal tear (Smith et al., 2013). Assisted vaginal deliveries have consistently been associated with an overall higher risk of perineal tears and more severe perineal tears (grades three and four) (Berg & Sahlin, 2020; Borges et al., 2022; Jansson et al., 2020; Okeahialam et al., 2021; Smith et al., 2013). Forceps and vacuum cups are the most common instruments used in assisted delivery. A Cochrane review in 2021 found that there is a greater risk of all grades of perineal tears and the most severe tears (grades three and four) with the use of forceps compared to vacuum cups (Verma et al., 2021). The international literature has consistently associated perineal tears with pelvic floor dysfunction symptoms, with more severe tears increasing the likelihood of severe symptoms (Dasikan et al., 2020; Huber et al., 2021; Sartore et al., 2024; Sigurdardottir et al., 2021).

Mother's demographics are associated with perineal tears

Maternal ethnicity is associated with perineal tears. Women of Asian descent have consistently been shown to have a higher risk of perineal trauma than other ethnic groups (Albar et al., 2021; Dahlen et al., 2013; Gurol-Urganci et al., 2013). A large retrospective cohort study of over one million women was conducted in the UK over 12 years to assess risk factors for perineal tears. The results show that Asian women were most likely to sustain a perineal tear, followed by black and then white women (Gurol-Urganci et al., 2013). In addition to ethnicity, BMI is associated with the

risk of perineal tears. Women with normal BMI have higher rates of perineal tears than obese or very obese women (Durnea et al., 2015, 2018; Shalabna et al., 2024).

Maternal age is not a clear risk factor for perineal tears in the international literature. Older maternal age has been associated with an increased risk of overall grade of tears and more severe perineal tears in some studies (Gurol-Urganci et al., 2013; Waldenström & Ekéus, 2017). However, other studies report younger age groups are more at risk or find no association (Dahlen et al., 2013; von Theobald et al., 2020).

There are evidence-based guidelines for preventing and treating pelvic floor dysfunction

Although evidence-based guidelines for preventing and treating pelvic floor dysfunction exist, New Zealand has not adopted or implemented guidelines into its public health system. The National Institute for Health and Care Excellence (NICE) based in the UK has two evidence-based guidelines for the management of pelvic floor dysfunction: Pelvic Floor Dysfunction – Prevention and Non-Surgical Management and Urinary Incontinence and Pelvic Organ Prolapse in Women; and Urinary Incontinence and Pelvic Organ Prolapse in Women – Management (NICE, 2019, 2021a). These guidelines clearly outline the need for an integrated health system approach to prevention and early intervention, especially in the perinatal period, to reduce the likelihood and or severity of pelvic floor dysfunction. Compared to New Zealand, the UK Government has recently published plans to implement a nationwide pelvic health service based on the NICE guidelines. This pelvic health service will focus on the perinatal period, including education, prevention, and early screening and intervention following birth (Department of Health and Social Care, 2023).

Little is known about pelvic floor dysfunction in New Zealand women

There is little evidence about the prevalence of pelvic floor dysfunction in New Zealand women, and there is a scarcity of evidence about access to services or outcomes for women in this country who experience pelvic floor dysfunction. Consequently, it is unknown if existing services are sufficient to address the needs of women with pelvic floor dysfunction. Recently there have been

anecdotal reports that many women in New Zealand are experiencing symptoms of pelvic floor dysfunction, especially in the postpartum period, and are not able to access care that may resolve these symptoms (New Zealand Herald, 2025; Radio New Zealand, 2021; Writes, 2020). These anecdotal reports have coincided with a petition to Parliament asking for better pelvic floor healthcare for women through the perinatal period (New Zealand Parliament, 2021). Later in 2024, due to increasing concern amongst New Zealand-based obstetricians and gynaecologists about the increasing prevalence of pelvic floor dysfunction they are witnessing, the Royal Australian and New Zealand College of Obstetricians and Gynaecologists asked the Government to introduce fully-funded pelvic floor muscle training for all pregnant women (RANZCOG, 2024). However, the New Zealand Government has not publicly responded to this request. Considering the anecdotal reports from women and calls for better care from health professionals specialised in pelvic floor dysfunction, it is likely that there is a considerable amount of unmet need for better pelvic health services for women in the postnatal period and that the current New Zealand maternal health system is failing women.

There is no evidence reporting the quantum or trend of pelvic floor trauma through childbirth in New Zealand

The international research is clear that mode of delivery and perineal trauma (perineal tears) are important risk factors for developing pelvic floor dysfunction. However, there is no evidence exploring the trends of mode of delivery or perineal trauma over a long period in New Zealand. Without this information, it is hard to estimate the prevalence of pelvic floor dysfunction in New Zealand women, and whether it may be changing over time.

There is no evidence exploring women's experience of accessing healthcare for pelvic floor dysfunction in New Zealand

There is no evidence exploring women's experience of accessing healthcare for pelvic floor dysfunction in New Zealand, but it is known that women residing in New Zealand are more likely to experience barriers to care than men. For example, the New Zealand Health Survey 2022/23

reported that women were more likely to experience barriers to primary care than men. One of these barriers was cost, with more women (15.1%) experiencing cost as a barrier to visiting their general practitioner (GP) compared to men (10.5%) (MOH, 2023).

There has been a recent improvement in public funding for pelvic floor dysfunction management in New Zealand. In September 2022, the New Zealand Parliament passed the Accident Compensation (Maternal Birth Injury and Other Matters) Amendment Act 2022 (Parliamentary Council Office, 2022). This legislation provides Accident Compensation Corporation (ACC) coverage to women with diagnosed birth injuries. This cover should improve access to healthcare for some women with pelvic floor dysfunction, but there is no evidence to support this yet.

The unmet need for pelvic healthcare in New Zealand is not known

As discussed, there is anecdotal evidence suggesting that there is a high unmet need for healthcare for pelvic floor dysfunction in New Zealand women, especially in the postpartum period. However, without accurate prevalence data, information on pelvic floor trauma, or the understanding of women's experience, quantifying accurate unmet needs for health services is impossible.

The New Zealand maternal health system

New Zealand has a universal public health system that provides free or subsidised core health services to eligible people. Health services are delivered through Health New Zealand (the operational agency that manages the public health system) or a range of other health entities, such as community organisations, Māori health providers, or private organisations (MOH, 2024a). Maternal care from pregnancy to six weeks after birth is predominantly free to eligible women. Most maternal services 'primary maternity services' are delivered through a Lead Maternity Carer (LMC) in the community who is most commonly a midwife. The LMC is responsible for organising the women's maternity care through the perinatal period, including referral to public secondary and tertiary care where required. Some services, such as maternal ultrasounds and antenatal education classes,

attract an out-of-pocket charge (Health New Zealand, 2024a). At six weeks after birth, the primary care for the women is returned to their usual primary care provider. Primary care in New Zealand is partially funded by the Government. General practices are private businesses and set their own fees for consultation in addition to the subsidies they receive from the Government (Health New Zealand, 2024b). This out-of-pocket cost has repeatedly been reported to be a barrier to accessing primary care, with 15.5% of adults reporting that they had not visited a GP in the last 12 months due to cost (MOH, 2024b).

Practical implications for the research

Without research exploring the prevalence of pelvic floor dysfunction, risk factor trends, and the experience of women accessing healthcare, it is challenging to change healthcare policy or healthcare provision. This research aims to provide policymakers and health system funders with two key additional pieces of evidence. First, information on the trend of mode of delivery and perineal trauma in New Zealand women. This evidence will provide information on a proxy for the prevalence of pelvic floor dysfunction in New Zealand, whether it is changing over time, and if it is more prevalent in different demographics of women. Secondly, information on how women experience accessing healthcare for pelvic floor dysfunction after birth. This evidence will provide information on whether the health system is responding to the pelvic floor needs of postnatal women. These pieces of evidence aim to provide an overall view of whether there is an unmet need for pelvic floor dysfunction services within the New Zealand health system.

Sex and gender equity

This research will use the terms 'female' (sex) and 'women' (gender). The research follows the Sex and Gender Equity in Research (SAGER) guidelines to support the use of these terms throughout the research (Heidari et al., 2016). The SAGER guidelines stress the importance of reporting sex and gender in research, as both factors are key determinants of health, and the historic underreporting of female sex and gender has been harmful to the understanding of health

differences between the sexes (Heidari et al., 2016). Female sex was recorded through the quantitative first stage of the study, which incorporates those biologically female. The second qualitative phase of the study uses the gendered term 'women' and is inclusive to transgender people, incorporating those who identify as men, gender queer, or non-binary (Moseson et al., 2020).

Thesis structure

This thesis has seven chapters. Following this introductory chapter, there are quantitative literature review, qualitative literature review, methodology, quantitative results, qualitative results, and discussion chapters.

Chapter Two: Quantitative literature review

This chapter contains a systematic review aimed at examining the prevalence of pelvic floor dysfunction (urinary incontinence, faecal incontinence, and pelvic organ prolapse) of women during the postnatal period (one year post-childbirth).

Chapter Three: Qualitative literature review

This chapter contains a review aimed at investigating women's barriers and challenges to accessing treatment or advice for their pelvic floor dysfunction symptoms during the postnatal period.

Chapter Four: Methodology

This chapter outlines the pragmatic research paradigm in which this research is set, the mixed methods methodology, and the methods undertaken.

Chapter Five: Results (quantitative findings)

This chapter contains the results from the quantitative phase of the study, which uses data from the National Maternity Collection and New Zealand Health Survey 2014/15 to answer the first

research question: How is the mode of delivery (childbirth) and associated pelvic floor trauma (perineal tears) changing in New Zealand?

Chapter Six: Results (qualitative findings)

This chapter contains the results from the qualitative phase of the study, which aims to answer the second research question: What are the experiences of women with pelvic floor dysfunction within the postnatal period (one year after birth) in accessing information, diagnosis, and treatment for their symptoms?

Chapter Seven: Discussion

This chapter integrates the findings from both phases of the study and critically analyses them in relation to the research questions and relevant literature. Following a discussion of the findings, recommendations are outlined. The strengths and limitations of the study are stated, followed by recommendations for further research.

Summary

This introductory chapter has provided a background to the research problem, established a rationale for the research, outlined the research questions, identified the practical implications of the research, and outlined the structure of the thesis.

Chapter Two – Quantitative literature review

The introductory chapter highlighted the importance of quantifying the prevalence of pelvic floor dysfunction. Considering the focus of this research is on pelvic floor dysfunction in the postnatal period it is integral to investigate the prevalence of female pelvic floor dysfunction in the year after birth. This chapter contains a systematic review aimed at examining the prevalence of pelvic floor dysfunction (urinary incontinence, faecal incontinence, and pelvic organ prolapse) of women during the postnatal period (one year post-childbirth). A systematic review has been used to rigorously summarise the available evidence to provide a reliable and generalisable assessment of the prevalence of pelvic floor dysfunction in the postnatal period (CASP, n.d.)

Background

Pelvic floor dysfunction is usually grouped into the three most common symptoms: urinary incontinence, faecal incontinence, and pelvic organ prolapse (Dieter et al., 2015; Nygaard et al., 2008). Both women and men can experience pelvic floor dysfunction, but the prevalence is significantly higher in women (MacLennan et al., 2000). Increasing age has been associated with pelvic floor dysfunction, and with a growing aging population this will likely place more burden on social and health systems (Wu et al., 2009). Wu et al. (2009) predicted that by 2050, 43.8 million women in the USA will experience at least one symptom of pelvic floor dysfunction.

Pregnancy and birth has been associated with pelvic floor dysfunction symptoms, and have been shown to have significant impact on quality of life (Palmieri et al., 2022; Snyder et al., 2022). Systematic reviews have found that urinary incontinence is highly prevalent in the postnatal period, with increasing parity increasing symptom prevalence (Moosdorff-Steinhauser et al., 2021b; Wuytack et al., 2022). There has not been a published systematic review of the prevalence of pelvic floor dysfunction (urinary incontinence, faecal incontinence, and pelvic organ prolapse) in the postnatal period.

Aim

The aim of this review was to examine the prevalence of pelvic floor dysfunction (urinary incontinence, faecal incontinence, and pelvic organ prolapse) of women during the postnatal period (one year post-childbirth).

Method

This systematic review was completed following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) methodology (Page et al., 2021).

Search and selection criteria

The MEDLINE (EBSCOhost), Scopus, CINAHL (EBESCOhost), and Cochrane databases were searched to identify relevant studies. Keywords included: prevalence, pelvic floor dysfunction/disorder, urinary incontinence, faecal incontinence, pelvic organ prolapse, parous women, pregnancy, childbirth, delivery, perinatal, and parturition. Only articles published since 2019 (to provide recent prevalence estimates), written in the English language, and conducted in OECD countries were included in this review. Only countries of the OECD have been included in this review to allow comparability to the New Zealand context. Within some non-OECD countries, there are confounding factors that may result in a higher prevalence of pelvic floor dysfunction symptoms such as poor access to health and maternity care, grand multiparity, and higher incidence of other conditions or cultural practices that also cause symptoms of pelvic floor dysfunction, such as female genital mutilation (FGM). In the preliminary review of articles, no research within countries known to have high rates of FGM commented on the possible relationship to pelvic floor dysfunction symptoms.

The following inclusion criteria were used to select studies for screening: studies between 2019 and 2023, OECD countries, prevalence of pelvic floor dysfunction/disorder (including urinary

incontinence, faecal incontinence, and pelvic organ prolapse) as an outcome, and pelvic floor dysfunction during the first year after birth.

Review process

All studies were imported into Covidence™. Once duplicates were removed, two independent reviewers screened the titles and abstracts against the inclusion/exclusion criteria. The full text of the eligible studies was reviewed and assessed for eligibility by the two reviewers. Selected studies were then read in full by two blinded reviewers who evaluated the study against the eligibility criteria and voted for inclusion or exclusion (across the eight reviewers Cohen's Kappa was >0.75). Any disagreement about the eligibility of the studies was resolved by a third independent reviewer.

Data extraction and study quality

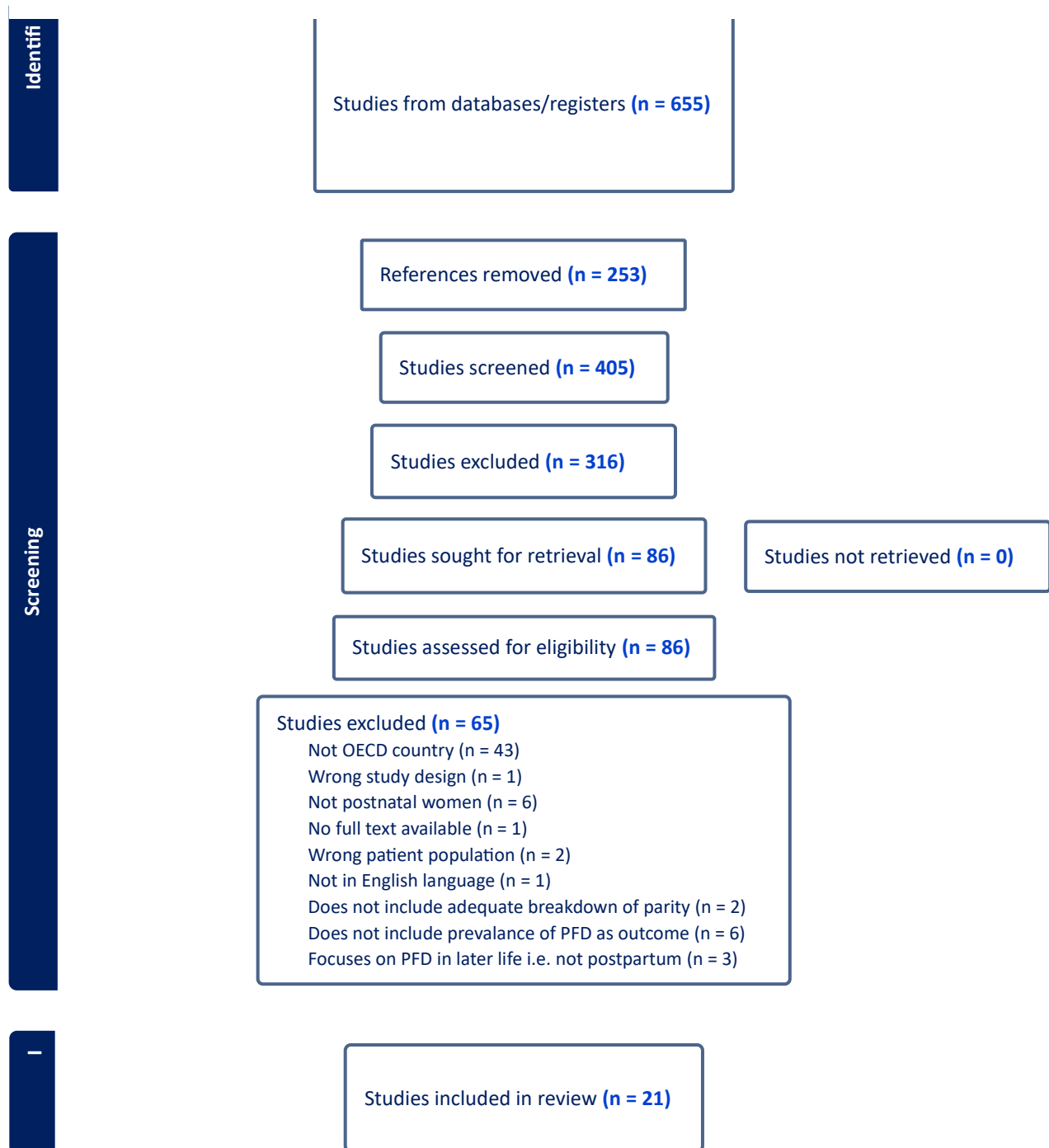
Data were extracted using a data extraction form adopted from the Cochrane Collaboration (The Cochrane Collaboration, 2017). All studies were assessed for quality and risk of bias using the National Institute of Health Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (NIH, 2021).

Search results

The review identified 655 studies for initial screening, of which 253 duplicates were removed. The title and abstracts of 402 articles were screened and 78 of these were advanced to full text review. Fifty-eight of these studies were excluded, predominantly due to not being conducted in an OECD country or not displaying prevalence of pelvic floor dysfunction during the postnatal period. Twenty-one studies have been included in this review.

Figure 1

Quantitative literature review search process



Study characteristics

Most research studies included in this review were prospective cohort studies (n = 15), with the remaining six studies cross-sectional designs. Most of the studies were conducted in Europe (Norway (n = 3), Sweden (n = 3), Italy (n = 2), France (n = 1), Finland (n = 1), Portugal (n = 1), Iceland

(n = 1), Spain (n = 1), Ireland (n = 1), Turkey (n = 1), the Netherlands (n = 1)), followed by the USA (n = 4) and Australia (n = 1). Eleven of the studies focused on pelvic floor dysfunction symptoms (urinary incontinence, faecal incontinence, and pelvic organ prolapse), while four studies focused on faecal incontinence only and six on urinary incontinence. For further information, please see Appendix 2.

Quality appraisal

Based on the National Institute of Health Quality Assessment Tool for Observational Cohort and cross-sectional studies, which has three quality ratings of 'good', 'fair' and 'poor', of the 21 studies, 11 had a rating of 'fair' and 10 had a 'poor' rating. Most of the 21 studies had a clear aim for the research and described the selected population (including inclusion and exclusion criteria) adequately. Studies quantified as 'fair' instead of 'good' were due to not justifying the sample size or noting the statistical power. All studies set sufficient timeframes to observe the outcomes and most used validated questionnaires. The primary reasons for poor results were less than 50% participation rate at baseline or significant loss to follow-up alongside poor description of confounding variables.

Prevalence of pelvic floor dysfunction in the postnatal period

Pelvic floor dysfunction symptoms are highly prevalent in the early postnatal period. Eleven studies reviewed the prevalence of pelvic floor dysfunction (urinary incontinence, faecal incontinence, and pelvic organ prolapse). Palmieri et al. (2022) conducted a large prospective cohort study of women during pregnancy and the early postnatal period (<6 weeks postnatal) (n = 2007). The validated Italian pelvic floor questionnaire for pregnant and postpartum women was used and found that nearly half of the women (43%) were experiencing pelvic floor dysfunction symptoms postnatally. In the first six weeks following birth, 20.7% of women were experiencing urge urinary incontinence, 33.8% stress urinary incontinence, 2.2% faecal incontinence, and 6.1% had symptoms of pelvic organ prolapse. The study does suggest no significant difference between the prevalence of pelvic floor dysfunction symptoms during pregnancy and postnatally, but there is no assessment of parity which may impact the results.

A cross-sectional study in Iceland of primiparous women at six to 10 weeks postpartum (n = 858) supports the study by Palmieri et al. (2022), reporting high prevalence rates of pelvic floor dysfunction in the early postnatal period. Sigurdardottir et al. (2021) aimed to estimate prevalence of pelvic floor dysfunction symptoms of women between six to 10 weeks postnatally and compare the results between women who delivered vaginally versus those who had a caesarean section. Maternal birth characteristics were extracted from health records and women recruited from the postnatal ward were asked to complete the Icelandic version of the Australian Pelvic Floor Questionnaire six weeks after childbirth. At six to 10 weeks postpartum, overall prevalence of pelvic floor dysfunction symptoms was high, with 48% of women experiencing urinary incontinence, 60% faecal incontinence (92% flatus only), and 29% symptoms of pelvic organ prolapse. Significant symptoms of pelvic floor dysfunction are indicated eight weeks after vaginal delivery in a prospective cohort study (n = 825) by Hill et al. (2021). Nineteen percent of women reported urge urinary incontinence, 29% stress urinary incontinence, 7% bulge pelvic organ prolapse symptoms, 23% flatulence, and 4.3% reported anal incontinence eight weeks after childbirth (Hill et al., 2021).

The prevalence of pelvic floor symptoms in postnatal women remains high after the early postpartum period. Siafarikas et al. (2022) utilised the International Consultation on Incontinence Questionnaire modules to question Norwegian women (n = 300) at six time-points from late pregnancy to eight years postpartum. They found relatively mild symptoms in the first 12 months postpartum, with relatively consistent scores across the six-week, six-month and 12-month time-points (Siafarikas et al., 2022). In contrast, a cross-sectional study of rural women (n = 472) in the USA reported high levels of moderate pelvic floor dysfunction in postnatal women. At an average of three-and-a-half months postpartum, 58% of women reported moderate pelvic organ prolapse symptoms, 66.4% moderate anal incontinence, and 68.1% moderate urinary incontinence (Snyder et al., 2022). This contrast in symptom severity may be indicative of the population group and parity. The Norwegian study included only primiparous women, whereas the American study grouped primiparous and multiparous women together. African American women were more likely to

experience moderate-to-severe pelvic floor dysfunction symptoms than White, Hispanic and Asian women (OR 5.2 (1.4-19.6)), which may also explain the variation in severity compared to the Norwegian study of Northern European women (Snyder et al., 2022).

A large prospective study of Italian women (n = 6023) reported that the prevalence of urinary incontinence and faecal incontinence dropped slightly between three and six months postpartum. At three months postpartum, 15% of women experienced urinary incontinence and 5.36% faecal incontinence, which dropped to 12.6% and 4.2%, respectively, at six months postpartum. Intensity of symptoms for both urinary and faecal incontinence also reduced between three and six months postpartum (Ferrari et al., 2022).

Pelvic floor dysfunction symptoms remain prevalent at one year postpartum. Nygaard et al. (2020) studied a large group of primiparous women (n = 825) who delivered their child vaginally. Using the Pelvic Organ Prolapse Quantification System (POP-Q) examination, alongside the Epidemiology of Prolapse and Incontinence Questionnaire, they found that 54.2% of women had symptomatic pelvic floor dysfunction. Of the sample, 53.1% reported stress urinary incontinence, 46.6% overactive bladder, 6% anal incontinence, and 9.4% demonstrated worse vaginal support on examination. Comparatively, Hill et al. (2021) found that at one year post-vaginal delivery, 15% of women experienced urge urinary incontinence, 41% stress urinary incontinence, 5% pelvic organ prolapse symptoms and 24% some form of anal incontinence (faecal or flatulence) (Hill et al., 2021).

Prevalence of urinary incontinence in the postnatal period

Evidence suggests that urinary incontinence is the most common symptom of pelvic floor dysfunction (Hill et al., 2021; Palmieri et al., 2022; Siafarikas et al., 2022; Snyder et al., 2022). Six studies explored the prevalence of urinary incontinence in postnatal women.

Three studies included prevalence estimates in early postpartum and found a high proportion of women experience urinary incontinence. A cross-sectional study of Dutch women (n = 415) who answered the International Consultation on Incontinence Questionnaire short form (ICIQ-

UI-SF) found that between six weeks and three months postnatally, 57% of women experienced urinary incontinence, of which 62% was stress urinary incontinence, 9% urge urinary incontinence and 19.8% mixed urinary incontinence (Moosdorff-Steinhauser et al., 2021b). A lower rate of urinary incontinence was found in a Swedish prospective cohort study (n = 951), with 12% of women reporting stress urinary incontinence and 6% urge urinary incontinence at eight weeks postpartum (Jansson et al., 2021). A prospective study following Finnish women (n = 891) from pregnancy to the postnatal period found a similar prevalence of urinary incontinence at three months postpartum. Sixteen percent of women reported urinary incontinence at three months postpartum, an over 50% reduction in symptom prevalence from pregnancy (Rajavuori et al., 2021).

Studies report varying degrees of urinary incontinence between six to 12 months postpartum. A small prospective cohort study (n = 173) in the USA found that 55% of primiparous women at 12 months postpartum experienced urinary incontinence (Giugale et al., 2021). Likewise, Moosdorff-Steinhauser et al. (2020) reported 56% of primiparous and multiparous women (n = 415) in the Netherlands experienced urinary incontinence at one year postpartum (Moosdorff-Steinhauser et al., 2021b). Ahlund et al. (2019) also found high rates of urinary incontinence in primiparous women at nine to 12 months postnatally. The prospective cohort study of Swedish women (n = 410) found that 45% of women experienced stress urinary incontinence, 38% urge urinary incontinence, and 27% mixed urinary incontinence (Åhlund et al., 2020).

Two studies reported lower rates of urinary incontinence at one year postpartum. A prospective cohort study of Swedish women (n = 670) reported 21% of women reported stress urinary incontinence, 8% urge urinary incontinence, and 11% unspecified urinary incontinence (Jansson et al., 2021). A smaller study of Spanish women (n = 109) found that 16% of women reported urinary incontinence at one year, but these results were not statistically significant due to significant loss of participants at follow-up points (Molinet Coll et al., 2022).

Prevalence of faecal incontinence in the postnatal period

Four studies investigated faecal incontinence in the postnatal period. Everist et al. (2019) aimed to estimate the prevalence of faecal incontinence between women who sustained obstetric anal sphincter injuries (grade three or four perineal tears) with women who did not (control group) at six weeks postpartum (n = 396). Everist et al. (2019) found that women with obstetric anal sphincter tears were more likely to experience any type of faecal incontinence (29.5%, OR = 4.68) or severe faecal incontinence (9.3%, OR = 4.00) compared to the control group. Twenty-three percent of the control group experienced some form of anal incontinence, with 6.9% experiencing severe anal incontinence. Berg and Sahlin (2020) similarly aimed to review faecal incontinence symptoms between women who had grade three or four perineal tears and women who had grade one or two perineal tears (n = 207). The study similarly found that participants with grade three or four tears had more frequent or more severe symptoms than those with grade one or two tears, but also found that the prevalence overall was lower than the study by Everist et al. (2019). Of the participants with grade one or two perineal tears, none had weekly symptoms of faecal matter incontinence, 14.8% had faecal urgency, and 12.5% had frequent involuntary leakage of flatus. Of the participants with grade three or four perineal tears, similarly none had weekly symptoms of faecal matter leakage, but a higher proportion of participants had faecal urgency (33.3%) and frequent flatus leakage (22.2%) (Berg & Sahlin, 2020)

A much larger prospective cohort study of Norwegian women (n = 1571) investigated anal incontinence from late pregnancy to six years postpartum. Johannessen et al. (2020) found that 14% and 13.3% of women reported some form of anal incontinence at six and 12 months, respectively, but no explanation of severity is reported (Johannessen et al., 2020). Similarly, a study of multiparous French (n = 6023) women found that at four months postpartum 14.4% of women reported flatus and 1.7% faecal incontinence (Fritel et al., 2020).

Vaginal delivery and pelvic floor dysfunction in the postnatal period

There is mixed evidence to suggest an association between delivery type and pelvic floor dysfunction in the postnatal period. Some research suggests that pelvic floor dysfunction symptoms are more likely in women who have delivered a child vaginally. Jansson et al. (2021) found that vaginal delivery was a significant risk factor for stress urinary incontinence in primiparous women compared to caesarean section at one year postpartum, but not for urgent urinary incontinence (OR 2.63 (95% CI 1.39-5.01)). Sigurdardottir et al. (2020) report that urinary incontinence and pelvic organ prolapse symptoms were more prevalent in women who delivered vaginally compared to those who had a caesarean section, but found no difference for symptoms of anal incontinence (Sigurdardottir et al., 2021). Similarly, Huber et al. (2021) found that pelvic floor dysfunction symptoms were more common in women who had a vaginal delivery than a caesarean section at 12 months postpartum (Huber et al., 2021). Both Huber et al. (2021) and Sigurdardottir et al. (2021) report that women who experience perineal tears (including episiotomy) from vaginal deliveries were more likely to develop pelvic floor dysfunction symptoms. However, obstetric anal sphincter injuries (grade three or four perineal tear) were identified as the most significant factor for predicting pelvic floor dysfunction. Specifically they found obstetric anal sphincter injuries to be strongly associated with prolapse symptoms (OR 7.7 (95% CI 2.1-29)), stress urinary incontinence OR 2.6 (95% CI 0.7-10), urge urinary incontinence OR 4.8 (95% CI 1.6-15), and anal incontinence OR 2.8 (95% CI 0.9-9.3)) (Huber et al., 2021).

Instrument assisted vaginal delivery and pelvic floor dysfunction in the postnatal period

Assisted or operative vaginal deliveries are associated with pelvic floor dysfunction symptoms. Three studies reviewed the association between assisted vaginal deliveries and pelvic floor dysfunction symptoms. At three months postpartum (n = 207) Borges et al. (2022) reported higher prevalence of pelvic floor dysfunction in women with operative deliveries (spatula and vacuum extractor) compared to spontaneous vaginal delivery, but this trend was not seen at six and

12 months postpartum (Borges et al., 2022). This study reviewed the use of a spatula rather than forceps (which are more widely used) and therefore this may reduce the generalisability of these results. The use of forceps and vacuum extractor delivery was reviewed by Everist et al. (2019) who discovered that the use of forceps was associated with anal incontinence and severe anal incontinence compared to non-operative delivery (OR 2.12 95% CI 1.00-4.49)). Instrumental delivery was also considered a risk factor for anal incontinence at four months postpartum in a multiparous population compared to spontaneous vaginal delivery and caesarean section (Fritel et al., 2020). Forceps delivery was found to be a risk factor for moderate-to-severe pelvic floor dysfunction symptoms in rural multiparous women (Snyder et al., 2022). Within this study population, women with prior history of vaginal births or who had three or more caesarean sections were also more likely to experience moderate-to-severe pelvic floor dysfunction symptoms.

Length of labour

The current research does not provide clear evidence of whether the length of labour is associated with pelvic floor dysfunction. O'Leary and Keane (2022) predominantly investigated the effect of the length of the second stage of labour and found that stress and urgency urinary incontinence were more common in women who had a second stage longer than 120 minutes. However, Ahlund et al. (2019) did not find any significant association between length of the second stage of labour and urinary incontinence (Åhlund et al., 2020). O'Leary and Keane (2022) found that women who had a longer second stage were more likely to require assisted delivery. Ahlund et al. (2019) did not provide comment on the type of vaginal delivery and length of labour. Therefore, it is uncertain whether the length of labour or the type of vaginal delivery is associated with pelvic floor dysfunction.

Age, BMI, and incidence of pelvic floor dysfunction in the postnatal period

Advancing age of the mother has consistently been associated with increased risk of pelvic floor dysfunction. Fritel et al. (2019) and Nygaard et al. (2020) report that women over 30 years of

age were more likely to experience faecal incontinence and pelvic floor dysfunction symptoms, respectively, postnatally. Women over 35 years were more likely to experience pelvic floor dysfunction symptoms, as was found in studies conducted by Palmieri et al. (2022), Ferrari et al. (2022), and Johannessen et al. (2022). Whereas Johannessen et al. (2022), in conjunction with finding association between older age (over 34 years) and faecal incontinence, found that women being under the age of 23 at birthing was associated with higher rates of anal incontinence compared to women aged between 23 and 34 years (Johannessen et al., 2020). Further analysis of the elevated rates of anal incontinence in the younger age group (under 23 years) is required to understand any possible associations considering this unusual finding. A raised BMI has been associated with pelvic floor dysfunction symptoms. A BMI over 25 is associated with an increased risk of pelvic floor dysfunction symptoms overall, as well as independently with urinary incontinence and anal incontinence independently (Dasikan et al., 2020; Ferrari et al., 2022; Palmieri et al., 2022; Sigurdardottir et al., 2021).

Evidence for practice

The evidence included in this review reports that women who have a vaginal birth are more likely to experience pelvic floor dysfunction, and this association is stronger if this birth is assisted (forceps or vacuum delivery) (Borges et al., 2022; Everist et al., 2020; Fritel et al., 2020). The NICE guidelines for pelvic floor dysfunction and non-surgical management support these findings, stating that childbirth and specifically assisted vaginal deliveries (forceps and vacuum) are non-modifiable risk factors. Therefore health professionals should educate and guide these women at higher risk of pelvic floor dysfunction and provide them with preventative tools such as pelvic floor muscle training and where to go to seek further support and treatment (NICE, 2021a). Everist et al. (2019) suggest that obstetricians should avoid the use of forceps where possible to reduce the prevalence of pelvic floor dysfunction. The Royal College of Obstetricians and Gynaecologists' guidelines do outline preventative strategies during labour to avoid an assisted delivery. However, when an assisted birth is

clinically indicated, the guidelines recommend that it be performed by an experienced health professional to reduce the risk of injury to the both the mother and child (Murphy et al., 2020). The evidence included in this review furthermore suggests that increasing age and obesity are risk factors for pelvic floor dysfunction symptoms. Dasikan et al. (2020) recommend that overweight or obese pregnant or postpartum women should be supported to lose weight to mitigate this risk. The NICE guidelines for preventing pelvic floor dysfunction do recommend supporting pregnant and postpartum women engage in regular physical activity and maintain healthy BMI to prevent and treat pelvic floor dysfunction (NICE, 2021a).

Considering the high prevalence of pelvic floor dysfunction in the postnatal period it is important to understand whether treatment methods such as pelvic floor muscle exercises and early resumption of exercise impact prevalence rates in the postnatal period. (Ferrari et al., 2022; Molinet Coll et al., 2022; Nygaard et al., 2021).

Recommendations for future research

Further research should aim to use comparable outcome measures to enable comparison of findings. Amongst the studies, there is variation in pelvic floor dysfunction terminology and what symptoms were measured. This variation prevents accurate comparison between studies. There are many internationally validated questionnaires, and more consistent use of these would enable better comparison of findings.

There was a large loss to follow-up in many of the prospective cohort studies, which increased the risk of bias in many of them. Strategies to mitigate this, such as mechanisms to maintain contact with participants over time, should be used to retain participants. Utilising cross-sectional studies of women in the postnatal period may mitigate the bias caused by loss to follow-up, but does not provide data on changing prevalence over time.

There was an inconsistent analysis of confounding variables, such as the number of births and demographic information across the studies. To support comparison between studies and a more in-depth and accurate analysis, consistent use of confounding variables should be used.

To mitigate some of these limitations the current study uses cross-sectional and retrospective cohort designs to investigate the prevalence of urinary incontinence and changes in mode of delivery and perineal tears over time. Possible confounding variables such as age, ethnicity and BMI were investigated in relation to mode of delivery and perineal tears.

Summary

This review has highlighted a consistently high prevalence of pelvic floor dysfunction symptoms in the postnatal period, with studies reporting that over 43% of women have at least one symptom in the year after birth (Palmieri et al., 2022; Sigurdardottir et al., 2021). Urinary incontinence was reported to be the most prevalent symptom, with up to 56% of women reporting some form of urinary incontinence symptoms (Giugale et al., 2021; Moosdorff-Steinhauser et al., 2021b). In addition to urinary incontinence, up to 14% of women reported some form of faecal incontinence in the year after birth, with symptoms significantly associated with perineal tears (Fritel et al., 2020; Johannessen et al., 2020).

The review concludes that the mode of delivery is associated with pelvic floor dysfunction symptoms. Studies reported that women who have a vaginal delivery are more likely to experience pelvic floor dysfunction symptoms than those who have had a caesarean section delivery (Huber et al., 2021; Jansson et al., 2021; Sigurdardottir et al., 2021). In addition, women who had an assisted vaginal delivery were the most likely to experience pelvic floor dysfunction symptoms (Borges et al., 2022; Everist et al., 2020; Fritel et al., 2020; Snyder et al., 2022). Furthermore, studies reported that women who sustained a perineal tear during their vaginal delivery were more likely to experience pelvic floor dysfunction symptoms, especially if they had a grade three or four perineal tear (Huber et al., 2021; Sigurdardottir et al., 2021). The review has also shown an association between age, BMI

and pelvic floor dysfunction symptoms, with advancing age and BMI both associated with a higher prevalence of pelvic floor dysfunction symptoms (Dasikan et al., 2020, 2020; Ferrari et al., 2022; Fritel et al., 2020; Nygaard et al., 2021; Palmieri et al., 2022; Sigurdardottir et al., 2021).

This review has highlighted that amongst internationally comparable countries within the OECD, symptoms of pelvic floor dysfunction symptoms are highly prevalent in the postnatal period. The review has also shown that risk factors, such as vaginal birth, assisted vaginal delivery, perineal tears, age, and BMI are associated with pelvic floor dysfunction symptoms. These findings warrant investigation in the New Zealand context to understand whether these risk factors are changing over time, which may impact the prevalence of pelvic floor dysfunction amongst New Zealand women.

Chapter Three – Qualitative literature review

The previous chapter's systematic review found a consistently high prevalence of pelvic floor dysfunction in the postnatal period across OECD countries. In addition, the review found an association between mode of delivery, perineal tears, and pelvic floor dysfunction symptoms. Considering this high prevalence of pelvic floor dysfunction, it is important to understand whether women can access the preventative strategies, early intervention, support, and treatment they need for their symptoms. This review broadly investigates all women in the postnatal period, and not just those with perineal tears. This chapter contains an integrative review aimed at investigating women's barriers and challenges to accessing treatment or advice for their pelvic floor dysfunction symptoms during the postnatal period. An integrative review was chosen for this literature review, to be able to provide a comprehensive review of the topic by using a wider variety of evidence (Cronin & George, 2023).

Background

The systematic review on the prevalence of pelvic floor dysfunction during the postnatal period concludes that there is a high prevalence of pelvic floor dysfunction in postnatal women. New Zealand does not currently have national guidelines for the treatment of pelvic floor dysfunction, but the NICE guidelines based in the UK recommend that at each postnatal contact, the health professional should check for signs of pelvic floor dysfunction, teach pelvic floor muscle exercises, and refer to a specialist provider where required (NICE, 2021b). A recent position statement made by the UK Royal College of Obstetricians and Gynaecologists (the College) calls for improving access to postnatal pelvic floor support in primary and community healthcare settings. The College also advocates for improving the education of healthcare professionals on pelvic floor health, as well as ensuring women have timely access to specialist treatment where appropriate (Royal College of Obstetricians and Gynaecologists, 2023). The Royal Australian and New Zealand College of Obstetricians and Gynaecologists in their recent briefing to the incoming New Zealand Minister of Health, advocates for better postnatal pelvic trauma

care, including easier access to physiotherapy (RANZCOG, 2023). In addition to these reports from national organisations, anecdotal evidence published by the New Zealand media and a petition to New Zealand Parliament about improving postnatal care indicate that there may be an unmet need for pelvic floor dysfunction in the postnatal period (New Zealand Parliament, 2021; Radio New Zealand, 2021; Writes, 2020)

Aim

This review aims to investigate women's barriers and challenges to accessing treatment or advice for their pelvic floor dysfunction symptoms during the postnatal period.

Method

This integrative review was completed following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) methodology (Page et al., 2021) and the integrative review methodology by Lubbe et al. (2020).

Search and selection criteria

The MEDLINE (EBSCOhost), Scopus, Cochrane, and Google Scholar databases were searched to identify peer-reviewed literature and Google search was used to identify relevant grey literature. Keywords included: access, barriers, seeking, experiences, treatment, intervention, therapy, management, pelvic floor dysfunction/disorder, urinary incontinence, faecal incontinence, pelvic organ prolapse, postnatal period, postpartum period, and postnatally. Only articles written in the English language and conducted in OECD countries were included in this review. Non-OECD countries have not been included in this review due to the differing nature of health systems compared to New Zealand.

The following inclusion criteria were used to select studies for screening: studies between 2019 and 2023 to capture current experience, OECD countries, pelvic floor disorders/dysfunction only (including urinary incontinence, faecal incontinence, and pelvic organ prolapse), and within the postnatal period (one year post-birth).

Review process

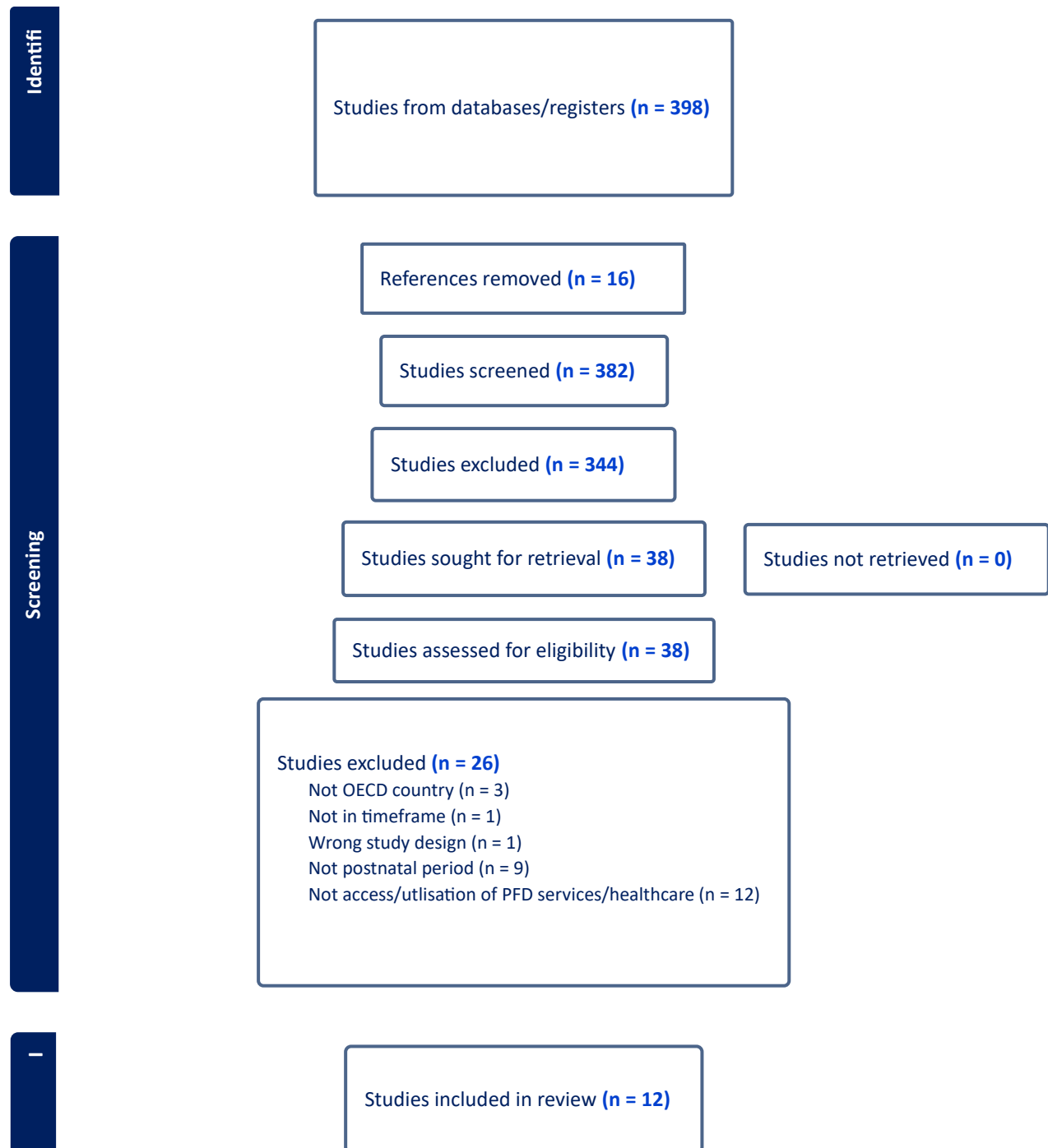
The review process was primarily conducted by the lead researcher, with coding and themes reviewed and discussed with the primary supervisor to reduce the risk of bias. Both the researcher and supervisor reflected on positionality regarding this topic, which remained a live discussion throughout the literature review process. All studies were imported into Covidence™. Once duplicates were removed, the reviewer screened titles and abstracts against the inclusion/exclusion criteria. The selected studies were read in full and evaluated against the eligibility criteria. All studies were assessed for quality and risk of bias using the Critical Appraisal Skills Programme (CASP) Qualitative Studies Checklist (CASP, n.d.-a).

The studies were analysed using thematic analysis following the six-phase process by Braun and Clarke (2021). To begin with, studies were read multiple times to become familiar with the data, with initial notes taken in relation to the research question. The second phase included initial coding of the dataset. The aim of the coding was to capture single concepts and content that was analytically interesting. The third phase generates initial themes. Groups of codes with similar concepts were clustered together to form primary themes. The fourth phase consolidates initial themes. The initial themes were reviewed in relation to the research question and the whole dataset. The fifth phase included naming and defining the themes to answer the research question. Writing up the report formed the sixth and final phase. The themes are written up in a coherent analytical narrative that answers the literature question.

Search results

The review identified 398 peer-reviewed studies for initial screening, of which 16 duplicates were removed. The title and abstracts of 382 articles were screened and 37 of these were advanced to full text review. Twenty-seven of these studies were excluded, primarily due to them not investigating access to healthcare for pelvic floor dysfunction or not being within the postnatal period. Eleven peer-reviewed studies and one grey literature article have been included in the final review.

Figure 2
Qualitative literature review search process



Study characteristics

All studies included in this review are qualitative research. Four studies used individual semi-structured interviews, three used questionnaires, two extracted threads from online forums, and one

used focus groups. Studies were conducted in the USA (4), UK (2), the Netherlands (2), Ireland (2) and Sweden (1). All studies were conducted with postnatal women, and one study in addition to postnatal women sought information from healthcare professionals looking after women in the postnatal period. Further information on study design, size, and findings are displayed in Appendix 3.

Quality appraisal

All studies had adequate methodology to achieve the aims of the study. Studies ranged in size from small individual interviews/focus group research (seven to 14 participants) to larger survey-based research (2000 participants), which provides a good balance of qualitative approaches and data collection. Most studies relied on participants registering interest in the study following seeing an advertisement via social media/local healthcare provider, which does introduce self-selection bias. Two studies used online forums with anonymous participants, which reduced the reliability of the data and accuracy of postnatal timing.

Themes

The following section discusses the themes identified from the integrative review. Six themes were generated from the literature: awareness of pelvic floor dysfunction in the postnatal period, inadequate pelvic floor information and education in the perinatal period, help-seeking behaviour, postnatal care is inadequate, pelvic floor muscle exercises, and views of health professionals. The theme of 'help-seeking behaviour' had two sub-themes: seeking help for pelvic floor dysfunction symptoms during the COVID-19 pandemic; and women wish to be asked by their healthcare professional about their pelvic floor dysfunction. Together these themes highlight the many barriers women experience in accessing the information, support, and treatment they need for pelvic floor dysfunction symptoms in the postnatal period.

Awareness of pelvic floor dysfunction in perinatal period

Women reported that they were unaware that symptoms of pelvic floor dysfunction could occur after birth. A small study in the UK, using individual interviews with women six months after birth to discuss postnatal bladder care, found that they were not aware that bladder issues such as incontinence would persist or start after the birth of their child. Women would have preferred to have been educated antenatally about the possibility of bladder issues, instead of dealing with issues while managing the other demands of a new baby (Gutierrez et al., 2019). Moosdorff-Steinhauser et al. (2023) via a similar study with individual interviews of postnatal women also found they were surprised that they had urinary incontinence postnatally, or that it had not resolved after birth. Most of the women in this study expected the symptoms to be temporary (Moosdorff-Steinhauser et al., 2023a).

Women reported that they did not know about pelvic organ prolapse or did not expect symptoms after birth. Du et al. (2021) found that women did not expect symptoms of pelvic organ prolapse to occur postnatally. The study used thematic analysis of relevant threads about pelvic organ prolapse from an online postnatal forum. The study found that women were unaware that pelvic organ prolapse could occur due to birth, and others were unaware of what pelvic organ prolapse was until they experienced it themselves (Du et al., 2021). Due to the nature of the online forum, demographic information (including the duration postpartum) about the writers' threads was not known, reducing the reliability of this data. Carroll et al. (2023) found a similar finding through interviews with postnatal women. Women reported that they had either not heard of pelvic organ prolapse before, or thought that it was a condition that affected older women (Carroll et al., 2023).

Inadequate pelvic floor information and education in perinatal period

Women reported difficulty getting accurate information on pelvic floor dysfunction and they recommended that education should be provided antenatally and readily available postnatally. A study utilising interviews with rural postnatal women across the USA found that they use the internet and talk to close friends or family to find out about pelvic floor information, diagnosis or exercises. However,

many of these women found that relying on the internet or friends' advice was insufficient (Snyder et al., 2022). Moosdorff-Steinhauser et al. (2023) also found that women gathered information about pelvic floor dysfunction on the internet or via friends, but discovered that they got frustrated by the contradictory information.

Women with perineal tears at birth are not given enough information about the tear, complications to be aware of, or where to get treatment. Lindberg et al. (2020) asked women who suffered a perineal tear at birth to answer open-ended questions within a questionnaire at eight weeks postpartum. A large sample of 1007 women fully answered the questionnaire. Many participants expressed they wanted more information about their perineal tear prior to leaving the maternity ward. Women wanted information on the healing process, complications such as pelvic floor dysfunction symptoms, and where to seek help if required (Lindberg et al., 2020).

Help-seeking behaviour in the postnatal period

Not all women seek help for their pelvic floor dysfunction symptoms due to numerous reasons including embarrassment, normalising symptoms, and limited information/advice available. A recent survey of 2000 postnatal women in the UK by the Royal College of Obstetricians and Gynaecologists found that 53% of women with symptoms of pelvic floor dysfunction had not sought any help, and of these 39% thought their symptoms were normal and 21% were too embarrassed to talk to a healthcare professional (RCOG, 2023). Moosdorff-Steinhauser et al. (2021b) found that many women did not seek help for their pelvic floor dysfunction symptoms, as they perceived their symptoms to be minimal bother or they thought their symptoms would resolve on their own. Four hundred and fifteen postnatal women were surveyed and asked about their help-seeking behaviour for urinary incontinence. Of the women surveyed, 57.1% experienced urinary incontinence, but only 25.7% sought help, most of these women seeking help sought advice from a pelvic physiotherapist and believed that pelvic floor muscle exercises were the best treatment for urinary incontinence (Moosdorff-Steinhauser et al., 2021b).

Women reported poor mental health due to their pelvic floor dysfunction symptoms, but they do not seek help due to the normalisation of their symptoms. Rural women in the USA reported through individual interviews that they had poor mental health due to their pelvic floor dysfunction symptoms and worried about long-term issues, but seeking care or treatment was a low priority (Snyder et al., 2022). Moosdorff-Steinhauser et al. (2023) discovered women accepted their urinary incontinence as a normal consequence of childbirth and would not seek care unless the frequency of their urinary incontinence worsened, occurred at unexpected times, or they had increasingly negative feelings about their symptoms. Those women with urinary incontinence who did not seek help reported that their symptoms were minimally bothersome and that they thought they would resolve on their own. Women would seek help in the future if their symptoms became more severe, required constant pad use, others could smell the urine loss, or it became a hindrance at work (Moosdorff-Steinhauser et al., 2021b). Women reported making lifestyle changes to manage their symptoms, such as not drinking as much fluid, laughing or coughing less, and using sanitary pads (Moosdorff-Steinhauser et al., 2023).

Accessibility of services is a barrier to some women seeking care for pelvic floor dysfunction. Limited proximity to appropriate healthcare professionals (such as physiotherapy) was identified as a barrier to women seeking healthcare (Snyder et al., 2022). Cost and proximity to appropriate healthcare professionals were also reported as reasons for not seeking care for pelvic floor dysfunction symptoms in a small study by Moosdorff-Steinhauser et al. (2023).

Seeking help for pelvic floor dysfunction symptoms during the COVID-19 pandemic

Women faced more pelvic floor dysfunction healthcare access issues during the COVID-19 pandemic. One study aimed to examine whether the COVID-19 pandemic had an impact on women with pelvic floor dysfunction. Milner et al. (2022) used an online survey to ask women about their experience of accessing healthcare for their pelvic floor dysfunction symptoms. Six hundred and forty-seven women completed the survey, 16 of whom were in the postnatal period. Postnatal women reported that they could not access healthcare professionals, and those who could get appointments were only offered

online options and no face-to-face assessments. Some of the postnatal women did access private physiotherapy after being unsuccessful at accessing a health professional through the public system, but it is not known whether this was face-to-face or online (Milner et al., 2022). Women found having symptoms of pelvic floor dysfunction and not being able to access appropriate assessment and treatment frustrating, which had a negative impact on their mental health (Milner et al., 2022).

Women wish to be asked by their healthcare provider about pelvic floor dysfunction

Women find talking about pelvic floor symptoms taboo and would rather healthcare professionals ask about symptoms, but this seldom occurs (Snyder et al., 2022). This finding was reflected by Moosdorff-Steinhauser et al. (2023) and Gutierrez et al. (2019) who found that women would not talk to their healthcare professional about their pelvic floor dysfunction symptoms unless directly asked. Women were shocked that health professionals did not ask about physical health after birth. When pelvic floor symptoms were discussed, the terminology such as “bladder care”, “hesitancy” and “urine flow” used by healthcare professionals was confusing, causing misinterpretation and miscommunication (Gutierrez et al., 2019). Gutierrez et al. (2019) report that due to this miscommunication, health professionals focused solely on women’s ability to pass urine after birth, rather than discuss wider pelvic floor health.

Postnatal healthcare is inadequate

Women reported that postnatal care for pelvic floor health is inadequate, with difficulty getting information, diagnosis, and treatment. Women with pelvic organ prolapse reported gaining minimal useful information from their GP, and appointments were often rushed and focused on their baby. Women reported that advice given for lifestyle modification was often impractical such as not lifting children, or not walking too much (Carroll et al., 2023). In addition, Du et al. (2020) found that GP care did not meet the needs of women with pelvic organ prolapse. Also, women reported needing more comprehensive and timely care, such as appointments with a pelvic physiotherapist, which women found beneficial (Du et al., 2021). Carroll et al. (2023), through their interviews with postnatal women

with pelvic organ prolapse, discovered that even when a pelvic organ prolapse diagnosis was given, there were often very long wait periods to see a specialist and cost barriers to seeing pelvic physiotherapists. When women did see a pelvic physiotherapist, the interactions were positive and provided hope and guidance for those with pelvic organ prolapse (Carroll et al., 2023).

Women with postnatal urinary incontinence reported similar frustrations with postnatal pelvic healthcare. Du et al. (2020) used the same methodology as their later study investigating pelvic organ prolapse via online forum threads to investigate women's experience of postnatal urinary incontinence. Limitations exist due to the anonymity of the participants in this study, but anonymity may prove beneficial in a taboo topic where women feel uncomfortable discussing their symptoms and experience (Du et al., 2021). Du et al. (2020) discovered that compared to women with pelvic organ prolapse, those with postnatal urinary incontinence felt that their GP was not providing them with adequate care or had enough knowledge about their symptoms to treat them sufficiently. Some women reported that their GP taught them pelvic floor muscle exercises, but this was not sufficient and they wanted support from a pelvic physiotherapist (Du et al., 2020).

GPs are not directly asking postnatal women about their pelvic floor health at their six-week check. A small study of nine women at six months postpartum with urinary incontinence reported similar issues with their primary care (Gutierrez et al., 2019). Women reported that at their six-week postnatal check they were not directly asked about their pelvic floor health, or the GP was not confident discussing pelvic floor issues. Women in this study raised that physical health, especially pelvic floor health, was not prioritised. Instead psychological health or feeding was discussed more regularly, which led to women internalising their urinary incontinence issues (Gutierrez et al., 2019).

Women who sustained perineal tears during childbirth expressed difficulty accessing the right healthcare services for their symptoms in the postnatal period (Lindberg et al., 2020). Women regularly have an eight to 10-week follow-up appointment with a midwife in Sweden, but some found that this was too late. Some women mentioned that they would have liked a specific postnatal check-up on their

tear to ensure healing and reduce the likelihood of pelvic floor dysfunction symptoms (Lindberg et al., 2020).

Pelvic floor muscle exercises

Women report that they have been told that pelvic floor muscle exercises are important for pelvic floor health via health professionals, provided leaflets or via the internet in the postnatal period. However, many are not sure they are completing them correctly and would like help from a health professional. A study with seven focus groups of postnatal women investigated the acceptability and barriers to pelvic floor muscle exercises in postnatal women. Grant et al. (2020) reported that most women did not think there was enough support for pelvic floor muscle exercise, and that they wanted a session with a physiotherapist to teach the correct technique. However, this was difficult to access through the public health system. Some women in this study suggested that their six-week postnatal check be with a physiotherapist rather than a GP to check pelvic floor health and provide advice on exercise and physical activity. The survey by the UK Royal College of Obstetricians and Gynaecologists found that of those women with urinary incontinence, only 55% don't perform pelvic floor muscle exercises and 25% do not know how to do them (Royal College of Obstetricians and Gynaecologists, 2023). Women express that they would like access to pelvic physiotherapists to provide advice and teach pelvic floor muscle exercises correctly (Du et al., 2020; Grant & Currie, 2020; Moosdorff-Steinhauser et al., 2021a).

Views of healthcare professionals

Health professionals also identified factors that prevented the assessment of women for pelvic floor dysfunction during the postnatal period. Alongside discussing women's experiences of postnatal urinary incontinence, Moosdorff-Steinhauser et al. (2023) conducted a focus group with health professionals (obstetricians/gynaecologists, midwives, and GPs) involved in women's postnatal care and asked about urinary incontinence support. The study found that there was a variation between healthcare professionals' inclusion of urinary incontinence issues during postnatal consultations and that

many were not aware of the current urinary incontinence guidelines. The medical professionals reported that they do not regularly ask women about urinary incontinence at their six-week postnatal check, but midwives were more likely to ask them if they had any symptoms. Most healthcare professionals reported that the postnatal check appointment times are short and that they need to prioritise the time to discuss other health issues, especially if the women had a difficult birth. In addition, the health professionals disclosed that they do not know who to refer symptomatic women to (Moosdorff-Steinhauser et al., 2023a).

Discussion

This integrative review highlights women's many barriers and challenges to accessing treatment or advice for their pelvic floor dysfunction symptoms during the postnatal period. These challenges can be grouped into two main themes: health system barriers; and women's attitudes and behaviour regarding symptoms of pelvic floor dysfunction.

Health system barriers

Internationally health systems have barriers to women accessing assessment, advice, and treatment for pelvic floor dysfunction in the postnatal period. One of the initial barriers is health professionals not providing women with information about pelvic floor health throughout their perinatal journey. This begins with inadequate antenatal pelvic floor education, which women recommend improving (Carroll et al., 2023; Gutierrez et al., 2019). Women also report not being able to access education about their pelvic floor symptoms from health professionals during the postnatal period, with most looking for information online or via friends and family (Moosdorff-Steinhauser et al., 2023; Snyder et al., 2022). The availability of a funded scheduled postnatal check by a primary care provider or obstetrician is inconsistent across the literature.

Alongside women not being able to access information, they were not able to access pelvic floor assessment or treatment in the postnatal period. Many women reported that the care they received in the postnatal period was inadequate, especially from their primary care provider who was not

knowledgeable about pelvic floor dysfunction and did not know who to refer to (Carroll et al., 2023; Du et al., 2020). In some cases, women were not able to access health professionals due to waiting lists or the location was too far away (Snyder et al., 2022). Women disclosed that health professionals were mostly focused on their baby's health rather than their own, and wished that they had asked about their pelvic floor health (Gutierrez et al., 2019). Health professionals did agree that they often did not ask women about pelvic floor health, as they had limited amounts of time with them to discuss a range of issues and were not sure who to refer them to (Moosdorff-Steinhauser et al., 2023).

Attitudes and beliefs about pelvic floor dysfunction

The symptoms of pelvic floor dysfunction remain a taboo or embarrassing topic, which does prevent some women from disclosing their symptoms to healthcare providers (Snyder et al., 2022). The taboo nature of pelvic floor dysfunction symptoms sits within the resistant taboo around sexual and reproductive health, which has shaped cultural norms influencing both women's and health professionals' behaviour (Tohit & Haque, 2024). The taboo around sexual and reproductive health creates needless additional barriers to women getting the care they need for their sexual and reproductive health needs, including pelvic floor dysfunction (Kingsberg et al., 2019; Tohit & Haque, 2024; Wood et al., 2024).

As well as women's embarrassment about their pelvic floor dysfunction symptoms, women describe not seeking care for these as they believed they were normal, would resolve on their own, or were not severe enough to seek care (Moosdorff-Steinhauser et al., 2021a; Royal College of Obstetricians and Gynaecologists, 2023).

Conclusion

This review has uncovered numerous barriers and challenges to women accessing assessment, treatment, and advice for pelvic floor dysfunction in the postnatal period. Different health systems have multiple barriers to women seeking the care they need to support women in their pelvic health recovery after birth. One of the first barriers is health professionals not providing women with the education they

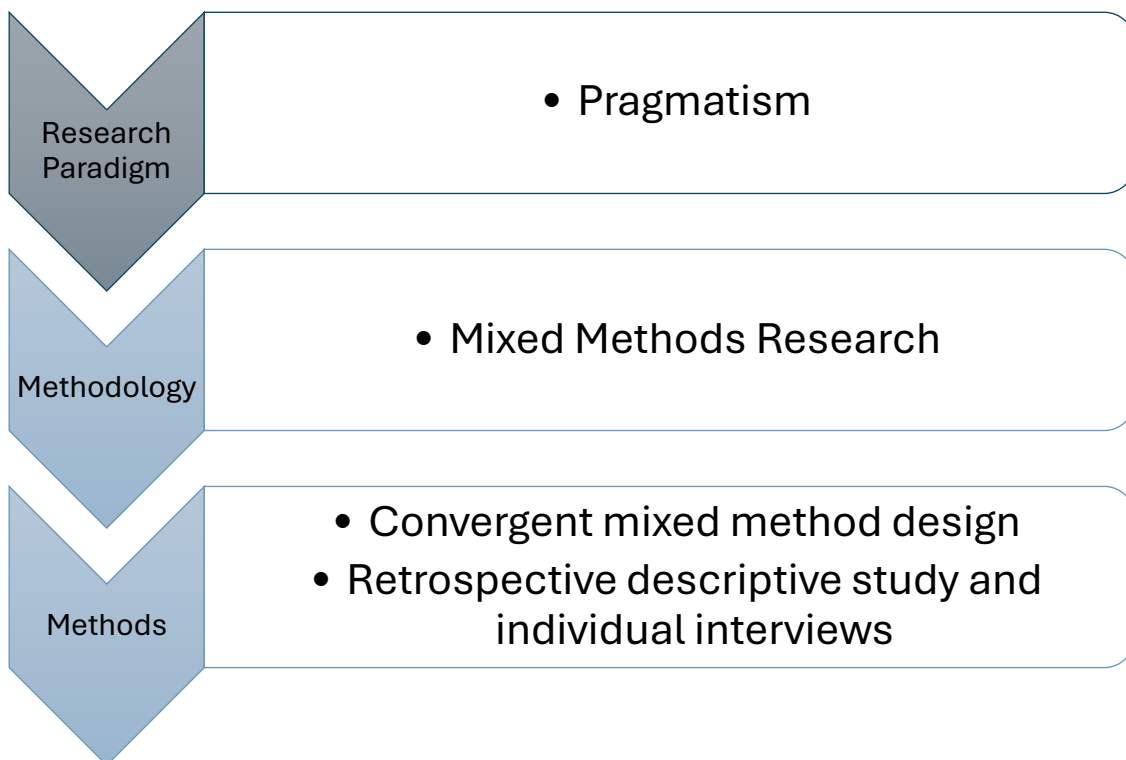
need about pelvic floor dysfunction, the likelihood of symptoms during pregnancy and after birth, and what self-help or services to seek if symptoms occur. Women who did seek care for pelvic floor dysfunction symptoms found that services were not accessible, suitable, or readily available. Poor service provision was exacerbated over the COVID-19 pandemic period. Women reported that postnatal care was inadequate, with limited opportunities to raise concerns about their pelvic floor dysfunction symptoms to health professionals (such as a postnatal healthcare check). Women reported that health professionals focus on the baby rather than the mother's health during postnatal appointments, which compounded the experienced inadequacy of maternal postnatal care. In addition to the health system barriers to accessing care, society (including healthcare professionals) has normalised pelvic floor symptoms, which in addition to the perceived embarrassing nature of the symptoms create further barriers to women getting the care they need. Both the system and societal barriers reduce the opportunities for timely education, screening, and intervention to address postnatal pelvic floor dysfunction.

Chapter Four – Methodology

This chapter will outline the theoretical framework, epistemology, methodology, and the methods used for data collection and analysis in this study. It begins by explaining the philosophical position of pragmatism that guides this research, which includes a description of the initial pragmatic approach to research in the early 1900s to modern-day pragmatism used in health research today. The chapter then discusses the benefits of mixed methodology in health research and how the methodology is used in this study through a convergent mixed method design. The chapter then describes the methods undertaken in this study – a retrospective descriptive study followed by individual semi-structured interviews. The chapter concludes by describing the ethical considerations of this research.

Figure 3

Methodology overview



Positionality and reflexivity

My professional career started with working as a physiotherapist, first in the UK and then in New Zealand. Clinical areas included intensive care, stroke rehabilitation, women's health, paediatrics, orthopaedics, and musculoskeletal outpatients within public, military, and private settings. Working in these settings within multidisciplinary teams provided me with invaluable experience of how health systems function from a clinician's perspective.

I have spent the last seven years working for the New Zealand Ministry of Health in policy roles. These roles have taught me the importance of evidence-based policy and evaluation to provide the best and most robust advice to Ministers on changes to the health system. Within these roles, I uncovered the lack of research into the prevalence of pelvic floor dysfunction in New Zealand and the limited understanding of women's experience with pelvic floor dysfunction symptoms in the postnatal period. This gap in research led me to undertake this study. In addition to my professional role, my personal experience as a woman navigating the health system and as a mother to a toddler has shaped my positionality to this research topic.

Philosophical position – pragmatism

The philosophical position of pragmatism guides and provides a theoretical framework for this research. Pragmatism or the 'pragmatic theory of truth' is a philosophy which emerged in post-civil war America, proposed by three prominent philosophers: Charles Sanders Pierce, William James, and John Dewey (Patton, 2015). William James is often viewed as the first real pragmatist, as he was the first to use the term 'pragmatism' in print, but James formulated his thinking on Pierce's early work (Pihlström, 2015). There were many similarities between the two philosophers' perceptions of pragmatism, principally as an approach to clarify their ideas and understand their practical ramifications (Glenwick & Leonard, 2012). However, there were fundamental differences in their approaches to pragmatism. Pierce pursued truth by a logical scientific method, to understand practical results by experimental means. In contrast, James undertook an action-orientated view of

pragmatism, drawing experience from human beings to understand the practical ramifications for people (Pihlström, 2015). Dewey later expanded on the work of James and Pierce, but had crucial foundational differences in their approach. Dewey (1916) stated that both James and Pierce were realists, both assuming real things cause effects or consequences. Dewey described pragmatism as a way to understand the meaning of these real things, using his concept of inquiry (Dewey, 1916). Dewey expressed that his concept of inquiry could be used to practically solve problems (Glenwick & Leonard, 2012). Although these three philosophers had differing perspectives on the theory of pragmatism, they all agreed that “truth is verified and confirmed by testing ideas and theories in practice” (Patton, 2015, p.152).

Health research, including this study, requires practical solutions to often complex problems. Patton (2015) suggests that pragmatism directs researchers to seek practical answers to complex questions. However, pragmatists highlight that the philosophy is not just problem-solving alone. Dewey sought to develop and reorient the philosophy away from abstract problems towards a focus on human experience (Morgan, 2014). Early philosophers relied on a dualistic view of reality, assuming reality consists of mind and matter separately. This dualism questioned the generation of knowledge or how the mind can encounter the world, which was presented as the ‘mind-world scheme’ (Biesta, 2010). Dewey rejected the ‘mind-world scheme’ and its options of objectivity or subjectivity and instead preferred the concept of experience (Biesta, 2010).

Exploring and understanding women’s experience of postnatal care is an important element of this study. Dewey explained ‘experience’ as the bringing together of beliefs and actions, placing importance on the source of beliefs and the meaning of actions (Morgan, 2014). Dewey stated that experiences created meaning by the merging of beliefs and actions (Morgan, 2014). This convergence of experience and thought led Dewey to reject the traditional theory of epistemology, instead preferring the theory of human experience, which led to his concept of inquiry (Dewey, 1938). Morgan (2014) interpreted Dewey’s concept of inquiry as the ‘research process’, in which new

knowledge is produced by experiencing the result of an action, and the outcome becomes a belief that can evolve with further research or inquiry (Morgan, 2014).

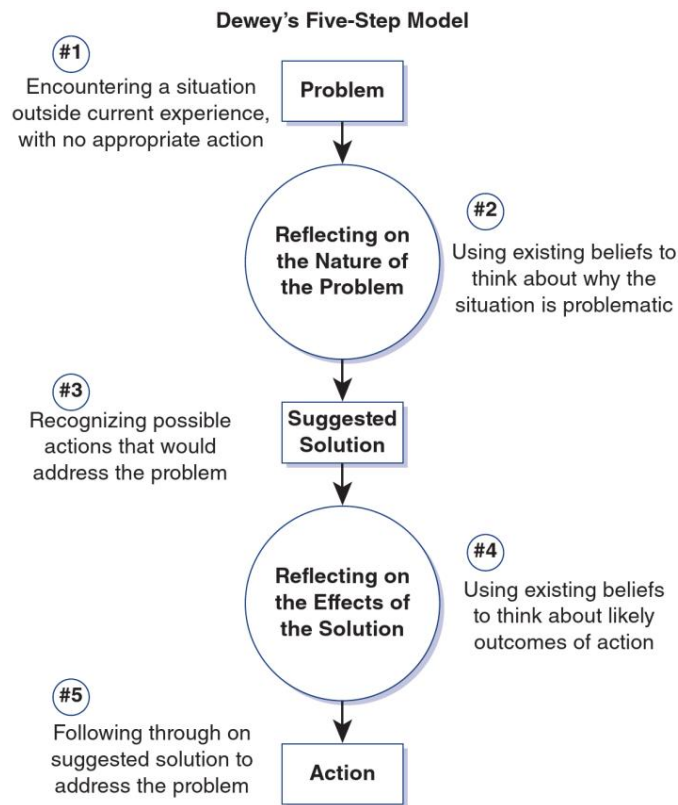
Dewey (1938) wanted to differentiate between solving day-to-day problems and more complex issues, using his theory of human experience. Dewey stated that experience required interpretation to provide an action, which was often drawn from human belief. Dewey explained that daily problems occur without conscious thought, which he termed 'habit', but more complex issues require more thoughtful conscious reflection, or inquiry (Morgan, 2014). This concept of inquiry forms the basis of pragmatic research. This philosophical basis and focus on experience were accused of subjectivism and too ambiguous to produce credible transferable research (Montague, 1909; Moore, 1905). At the time Dewey (1905) disagreed with this criticism, stating that inquiry allows all aspects of human experience to be analysed, bringing together conscious and unconscious thought with scientific knowledge important for modern analysis and research (Dewey, 1905).

Dewey's conceptualisation of inquiry or self-conscious decision-making is focused around a 'problematic situation' and its possible solution (Brown, 2012). The approach to inquiry is consolidated into five steps:

1. Identifying a problem or problematic situation
2. Defining the problem
3. Developing a possible solution to respond to the problem
4. Evaluating a possible solution to respond to the problem
5. Taking action/s that are likely to resolve the problem (Morgan, 2014).

Figure 4

Dewey's Five-Step Model, Morgan, 2014, p.30



These five steps are a simple approach to conscious problem-solving and still form a useful basis of pragmatic research, but contemporary academics have sought to modernise pragmatic theory to suit present-day research agendas. Simpson et al. (2017) called for pragmatism to incorporate theory into practice to facilitate change theory into everyday problem-solving. Other researchers have used pragmatism as a licence to explore other research methods, using different research techniques to explore human experience and people's engagement with the world around them (Tebes, 2012).

Pragmatists see research methods as tools to aid understanding of a problem and are more likely to be aware of all the research techniques and methods available to them (Onwuegbuzie & Leech, 2005). Greene and Hall (2010) state that pragmatism allows researchers flexibility when choosing a research method, understanding that different methods will yield answers depending on human experience (Greene & Hall, 2010). Pragmatists believe that the research question should

direct the research methods, instead of an underpinning philosophy, rejecting the objective/subjective philosophical dualism (Kaushik & Walsh, 2019). Biesta (2010) suggests pragmatism should be viewed as a set of physiological tools rather than a philosophical position. This disbelief in 'epistemological purity' may be a reason for the increase in pragmatic mixed methods research (Onwuegbuzie & Leech, 2005).

Pragmatism and mixed methods research

Pragmatism is a popular approach for mixed methods research. Biesta (2010) suggests the popularity of pragmatism in mixed methods studies is that the methodology and methods of mixed methods research are primarily driven by the research question, rather than philosophical assumptions. Shan (2022) proposes that pragmatism gives researchers methodological flexibility, as they do not need to choose between the post-positivist position and the constructivist position, allowing for both quantitative and qualitative data collection and analysis (Shan, 2022).

Onwuegbuzie and Leech (2005) agree that mixed methods research suits a pragmatic approach as pragmatists often have a "bifocal lens" and can examine detail and the wider picture (Onwuegbuzie & Leech, 2005, p.383).

A pragmatic approach was chosen for this study for several reasons. First, pragmatism allows the research to be guided by the research problem or questions, rather than being driven from an epistemological stance. In addition to the research question driving the research, the focus on understanding the human experience and its impacts on actions was important for the qualitative phase of the study, which explored women's experience of pelvic floor dysfunction in the postnatal period. The pragmatic approach aims to provide practical answers to complicated and multifaceted issues that suit the complex research problem. Finally, a pragmatic approach allows methodological flexibility to use a mixed methods approach, which allows both quantitative and qualitative data to be collected.

Methodology – mixed methods

Mixed methodology is a modern flexible methodology that has been called the ‘third wave’ or the ‘third research movement’, which aims to allow researchers an alternative to single method studies (Johnson & Onwuegbuzie, 2004). Tashakkori and Creswell (2007) define mixed methods as a single study in which the researcher collects and analyses both quantitative and qualitative data to draw conclusions (Tashakkori & Creswell, 2007). This methodological flexibility led to an increase in mixed methods popularity in the social and behavioural sciences in the early 2000s, with a rapid increase in studies since (Timans et al., 2019). However, many researchers historically (and to a lesser extent in the last 20 years) have argued that quantitative and qualitative methods with their contradictory positivistic and interpretivist paradigms are incongruous and advocate for the ‘incompatibility thesis’ (Howe, 1988). Howe (1988) rejected the ‘incompatibility thesis’, arguing that there is no incompatibility between quantitative and qualitative methods or epistemology, advocating for a pragmatic approach to research.

The recent popularity of mixed methods research may be that present day research questions often require a dualistic approach to answer. Tariq and Woodman (2013), and Creswell (2007), advocate that mixed methods can more comprehensively address large and complex health research questions, rather than using quantitative or qualitative methods in isolation. Creswell and Clark (2007) argue that a problem uncovered by quantitative research can be best understood by qualitative inquiry to explain and enhance the quantitative results (Creswell & Clark, 2007).

The complexity of using a mixed method approach to address a research problem requires a strong theoretical drive. Morse and Niehaus (2009) describe the theoretical drive as the overall inductive or deductive “conceptual direction of the project”, which should be reflected in the research question (Morse & Niehaus, 2009, p.24). Quantitative research usually adopts deductive methods (testing of a hypothesis), while qualitative methods are usually driven by inductive inquiry (discovery with no prior assumption) (Morse et al., 2006).

Table 1

Induction and deduction, adapted from Morse et al., 2006; Tariq & Woodman, 2013

Induction	Deduction
Building theory	Testing theory
No prior assumption or hypothesis	Motivated by assumption or hypothesis
Hypothesis emerges from the data	Generalisable findings
Mode of discovery and/or understanding	Reliable and repeatable results

As the research questions require both quantitative and qualitative inquiry, and subsequently deductive and inductive approaches, this study will adopt an abductive stance which permits researchers to both test and build theory in one study (Morse & Niehaus, 2009b). The theory of abduction allows researchers to move between deductive and inductive methods, collecting the benefits of both types of knowledge generation (Fielzer, 2010). Tariq and Woodman (2013) advocate that the abductive approach is a particular benefit, as using both deductive and inductive methods enables the researcher to gain the benefits of both and counteract the weaknesses of either approach alone. An abductive approach acknowledges that there are multiple ways to solve a problem, encouraging both analytical and theoretical processes. This method allows hypotheses and explanations to emerge through the research process and can be developed and tested by both quantitative and qualitative methods (Wheeldon & Ahlberg, 2011).

The initial stage of this study has a deductive direction, utilising quantitative methods to estimate the prevalence of urinary incontinence and identify whether risk factors for pelvic floor dysfunction (perineal tears and mode of delivery) are changing over time. Quantitative data from the New Zealand Health Survey 2014/15 are used to identify women who experience urinary incontinence. The National Minimum Dataset (NMDS) is used to identify whether mode of delivery and perineal tears are changing over time and whether they are associated with maternal age,

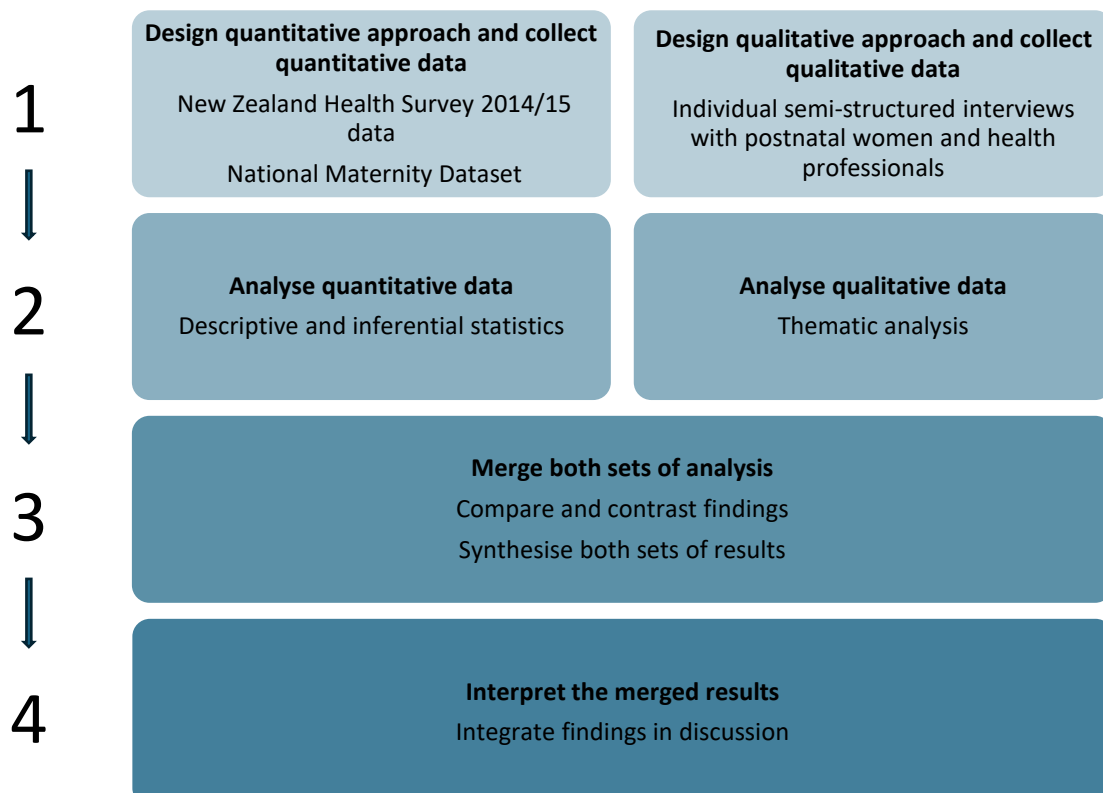
ethnicity, and BMI. The second aspect of the study takes an inductive approach, using qualitative methods to generate theory from data collection (Morse & Niehaus, 2009a). The secondary qualitative aspect of the study allows themes and patterns to emerge from the interactions with postnatal women (Kennedy, 2018). The third abductive stage will involve triangulation, where both the quantitative and qualitative results are merged to allow analysis across both datasets (Creswell & Clark, 2018a).

Mixed methods design – convergent design

This study will use the Creswell and Clark (2018) Convergent Mixed Method Design with a parallel-databases variant. This study design collects and analyses two separate datasets which are then brought together for analysis and discussion. This method allows different data on a complementary topic to be collected and analysed to be finally merged to provide a comprehensive analysis of a research problem.

Figure 5

Implementing a Convergent Mixed Methods Design, adapted from Creswell and Clark (2018), p.70



Methods for quantitative phase

The overall research question for the quantitative phase of this study is: 'How is the mode of delivery (childbirth) and associated pelvic floor trauma (perineal tears) changing in New Zealand?'

Within this question are the following sub-questions:

- How have the rates of different modes of delivery (spontaneous vaginal, assisted, and caesarean section) changed since the early 2000s in New Zealand?
- What proportion of women experience a perineal tear after childbirth and has this changed since the early 2000s?
- Are there any associations between age, ethnicity, BMI, and mode of delivery, with the incidence of perineal tears?
- What was the prevalence of urinary incontinence in women residing in New Zealand in 2014/15?
- Is pregnancy and the number of times a woman has been pregnant related to having urinary incontinence?
- Are there associations between age and urinary incontinence, as well as between ethnicity and urinary incontinence?

Data collection

To answer the research questions, two separate datasets were used: the National Maternity Collection; and the New Zealand Health Survey 2014/15.

National Maternity Collection. The National Maternity Collection provides statistical, demographic, and clinical information about publicly funded maternity services for the perinatal period (pregnancy, birth, and three months after birth). The data for the National Maternity Collection is sourced from the National Minimum Dataset and the Primary Maternity Services Notice (service specifications and payment rules for the provision of community-based primary maternity services) and is complete from July 2002. The use of both data sources provides information on the perinatal period, both inpatient (NMDS) and community care (the Notice) (MOH, 2021). At the time of the data request, the information was held by the Ministry of Health. Health New Zealand now holds this data following the health reforms in 2022.

This dataset was used to answer the following questions:

- How have the rates of different modes of delivery (spontaneous vaginal, assisted, and caesarean section) changed since the early 2000s in New Zealand?
- What proportion of women experience a perineal tear after childbirth and has this changed since the early 2000s?
- Are there any associations between age, ethnicity, BMI, and mode of delivery, with the incidence of perineal tears?

The following variables were used to answer the research questions: age of women at first LMC appointment, BMI, mode of delivery (spontaneous vaginal delivery, assisted delivery (includes: forceps, ventouse, and other assisted; and caesarean section), and perineal tears (no tear, grade one, two, three, and four).

New Zealand Health Survey 2014/15. The New Zealand Health Survey is an annual survey, which is used to monitor the health of the New Zealand population. The survey has a set of core questions with rotating additional topic areas/modules. The New Zealand Health Survey 2014/15 included an additional module on sexual and reproductive health, which is utilised for this study.

This dataset was used to answer the following questions:

- What was the prevalence of urinary incontinence in women residing in New Zealand in 2014/15?
- Is pregnancy and the number of times a woman has been pregnant related to having urinary incontinence?
- Are there associations between age and urinary incontinence, as well as between ethnicity and urinary incontinence?

The following variables (included in the survey) were used to answer the research questions: age of women at first LMC appointment, ethnicity, frequency of urinary incontinence, severity of urinary incontinence, and number of pregnancies.

Applications for data were made to Stats New Zealand (CURF licence for the New Zealand Health 2014/15 survey data) and the Ministry of Health (National Maternity Collection). Both applications for data were successful and both agencies agreed to transfer requested data files. The files were received from the Ministry of Health and Stats NZ in a text file and were transferred into the Auckland University of Technology (AUT) secure cloud-based storage facility.

The file received from the Ministry of Health was 18 years of the National Maternity Collection from 2002 to 2020. This large file (over 1.2 million cases) was moved into Excel for data cleaning. The years 2002 and 2020 had half the number of births and were deemed incomplete and were therefore discounted. The dataset was complete and inclusive from 2003 to 2019. Each birth event had a unique birth identifier key. This was used to check for duplicates in the dataset. The minimal number of duplicate birth events was removed from the dataset. The dataset had a large number of variables (>500) for each birth event. Variables not relevant to this study were removed to improve the usability of the dataset.

The file received from Stats NZ included the core New Zealand Health Survey 2014/15 and the Sexual and Reproductive Health Module. Only the Sexual and Reproductive Health Module was needed for this study as this also included demographic details of the participants. This dataset was

moved into Excel for data cleaning. Each participant had an identifier key, which was used to check for duplicates in the dataset. Duplicates and the variables not required for this research were removed. Data collection and cleaning of both datasets were conducted by the primary researcher and checked by the supervisor/biostatistician to minimise errors.

Data analysis

The analysis was conducted using both SPSS v.29 and RStudio 2023.06.0. This section describes the descriptive and statistical tests used to analyse the included variables in both the National Maternity Collection and New Zealand Health Survey 2014/15 datasets. Further detail on the analysis is included in the results section. To ensure analytical rigor, appropriate statistical tests were conducted multiple times, and confidence intervals were displayed. All statistical analysis was checked by the researcher's supervisor/biostatistician.

Data analysis – National Maternity Collection dataset

First, a descriptive analysis of the women's demographic information was conducted, which included women's age at their first LMC appointment, prioritised ethnicity, and BMI. Descriptive analysis was undertaken of the following variables: age at first LMC appointment, BMI, ethnicity, number of births, mode of delivery and perineal tears. This section outlines each variable and how the results are reported.

Age at first LMC appointment. Descriptive analysis of women's age was conducted to determine the distribution of the age of the mothers. The mean, standard deviation, median, minimum, and maximum across the entire dataset are reported.

Body Mass Index (BMI). Women's BMI was grouped into four categories: underweight, normal weight, overweight, and obese based on standard BMI categories (Nutall, 2015). This information is reported as a count and percentages of women's BMI within each category.

Ethnicity. Women's ethnicities were grouped into categories and are reported as count and percentages within each category. Women's ethnicities were grouped into single ethnic groups in an order of priority, based upon government hierarchical guidance, even if women identified with one or more ethnicity. Ethnic groups were prioritised based on the following order: Māori, Pacific Peoples, Asian, Middle Eastern, NZ European, Other. Ethnicities were prioritised into single ethnic groups to be able to conduct inferential statistics, allowing comparison between ethnicity and other variables.

Number of births. The number of births, and their percentages, are reported as the total number of births per year and displayed as an annual count over the period.

Mode of delivery. The mode of delivery was grouped into three categories: spontaneous vaginal birth, assisted delivery (includes ventouse, forceps, and other assisted), and caesarean section (includes elective and emergency caesarean section). Descriptive analysis was conducted and is reported as a count of birth category per year, percentage of mode of delivery each year, and displayed over time.

Secondly, statistical analysis was used to examine any relationship between variables. Multiple logistic regression was used to assess the relationships between modes of delivery, age, and ethnicity. Logistic regression analysis was chosen to examine relationships between two or more variables, with a categorical outcome variable and predictor variables that are continuous or categorical (Field, 2009).

Change in mode of delivery over time. Descriptive analysis was used to examine whether there was a trend in the mode of delivery categories (spontaneous vaginal delivery, assisted delivery, caesarean section) over time. The number and proportion of each category are reported.

Associations between mode of delivery and age, ethnicity, and BMI. A multiple logistic regression was conducted entering both age (<25 age group as reference), ethnicity (NZ European ethnicity as reference), and BMI (underweight category as reference) as possible predictors of each mode of delivery. An interaction between age and ethnicity was also tested. Age was collapsed into four categories, using the 25th, 50th, and 75th quartiles, and prioritised ethnicity was used. The odds ratio, 95% confidence intervals, and p-value are reported.

Perineal tears over time. Tears were grouped into five categories: no tear, grade one tear, grade two tear, grade three tear, and grade four tear. This information is reported as a count of tear category per year, percentage of tear category per year, and displayed over time. Descriptive analysis was used to examine whether there was a trend in perineal tear categories over time. The number and proportion of each category are reported.

Associations between perineal tears and mode of delivery. Univariate logistic regression analyses were conducted to examine the association between each mode of delivery and the degree of perineal tear. The odds ratio, 95% confidence intervals, and p-value are reported.

Associations between perineal tears, BMI, and age. To assess the relationships between maternal age and the degree of tear, as well as between BMI, ordinal logistic regressions were conducted with the ordinal levels of tears (from no tear to third/fourth degree) entered as the outcome. Age was split at the median to create a binary predictor variable of age. The four ordinal categories of BMI were used. The odds ratio, 95% confidence intervals, and p-value are reported.

Data analysis – New Zealand Health Survey Sexual and Reproductive Health Module

2014/15 dataset

Descriptive analysis was undertaken of the following variables: age, ethnicity, pregnancy history, and urinary incontinence. This dataset only contained information related to urinary

incontinence and not the other symptoms of pelvic floor dysfunction; faecal incontinence or pelvic organ prolapse.

Age at time of survey. Descriptive analysis of women's age was conducted to determine the distribution of the age of the women. The mean, standard deviation, minimum, and maximum are reported.

Ethnicity. Women's ethnicities were grouped into categories and are reported as count and percentages within each category. Women's ethnic groups were then categorised based on prioritisation and are reported as count and percentages. Ethnicity was prioritised by the following order: Māori, Pacific Peoples, Asian, Middle Eastern, NZ European, Other.

Pregnancy. Women's pregnancy history was grouped into categories: have or haven't been pregnant; and number of pregnancies. Women's pregnancy status is reported as count and percentages.

Urinary incontinence. Women's reported frequency and severity of urinary incontinence are grouped into categories based on the categories provided within the New Zealand Health Survey 2014/15 and reported as count and percentages.

Secondly, a series of binary logistic regressions were conducted to investigate the relationships between urinary incontinence and the factors of pregnancy, age, and ethnicity.

Association between frequency and severity of urinary incontinence. An ordinal logistic regression was conducted to test the relationship between frequency and severity of urinary incontinence. The odds ratio, 95% confidence intervals, and p-value are reported.

Association between urinary incontinence and age, ethnicity, and pregnancy. A series of binary logistic regressions were conducted to investigate the relationships between urinary incontinence and factors, age ethnicity, and pregnancy. The odds ratio, 95% confidence intervals, and p-value are reported.

Association between urinary incontinence and number of pregnancies. A univariate logistic regression was conducted to investigate the relationship between urinary incontinence and pregnancy and the number of pregnancies. The odds ratio, 95% confidence intervals, and p-value are reported.

Methods for qualitative phase

The qualitative phase of this study was designed to answer the following research question:

- What are the experiences of women with pelvic floor dysfunction within the postnatal period (one year after birth) in accessing information, diagnosis, and treatment for their symptoms?

Data collection

Semi-structured individual interviews. Data were collected in this phase of the study using individual semi-structured interviews. Semi-structured interviews are interviews between a researcher and participant where the researcher has a short set of questions to guide the interview. However, these questions can be supplemented by follow-up or probing questions, depending on the participants' responses (DeJonckheere & Vaughn, 2019; Edwards & Holland, 2013). The core set of questions provides some structure to the interview, but allows the researcher flexibility to ask the

questions in a different order, frame the questions in another manner, and ask other questions based on the participant's discourse.

This method of interviewing collects open-ended data and is beneficial when a researcher wants to explore a participant's unique experience or beliefs (Adeoye-Olatunde & Olenik, 2021; DeJonckheere & Vaughn, 2019). The dynamic between interviewer and participant is important when discussing personal experiences. The semi-structured interview method has been found to be successful in enabling reciprocity between the interviewer and participant (Kallio et al., 2016). Considering the sensitive nature of this research topic, a more flexible approach to interviewing is suitable to build a trusted relationship between researcher and participant to enable rich accurate data. For these reasons, semi-structured interviews were used in the qualitative phase of this study. To fully understand the wider context of the postnatal period during which women are accessing help and support, health professionals involved in caring for women in the postnatal period and postnatal women were interviewed.

Recruitment for health professionals. Recruitment flyers were sent to key professional groups and clinical contacts who are involved in the postnatal care of women (see Appendix 11 for the recruitment flyer). Interested participants contacted the researcher by email to register their interest. The researcher provided interested participants with an information sheet that explained the study in more detail (see Appendix 9). Once interested participants had read the information sheet and asked any follow-up questions via email or phone call, a meeting time was scheduled. Participants were sent a password-protected virtual meeting link and meeting invitation via email.

Recruitment for postnatal women. The inclusion criteria were all women who had given birth within 12 months in New Zealand and could speak English. Information flyers were placed on social media (Facebook) sites focused on mothers and pelvic floor dysfunction support groups (see Appendix 10). Requests to share or display flyers were sent to pelvic physiotherapy clinics, general practices and NGOs (e.g. Continence NZ). Interested participants contacted the researcher by email

to register their interest. The researcher provided interested participants with an information sheet that explained the study in more detail (see Appendix 8). Once interested participants had read the information sheet and asked any follow-up questions via email or phone call, a meeting time was scheduled. Participants were sent a password-protected virtual meeting link and meeting invitation via email.

Conducting interviews. Interviews were conducted via a password-protected virtual online platform (Google meet). Only the participant and researcher were present. Semi-structured interview questions were developed based on the research question to guide the discussion (please see Appendix 11). The researcher conducted a verbal consent form, and the interview commenced once the participant had provided their consent (see Appendix 7 for oral consent form). Nine interviews with postnatal women were conducted, which reached data saturation. A further four interviews with health professionals provided useful context from a clinical perspective and provided rigor to the analysis. The interviews were recorded and transcribed verbatim. These recordings and transcriptions were checked by the primary researcher and supervisor.

Data analysis

Methodological approach – qualitative description. A qualitative description approach was taken for data analysis of the individual semi-structured interviews. The analysis must be accurate, useful, and accessible for health professionals and policymakers to understand and interpret the data to make changes to practice. Considering this desired outcome, the naturalistic perspective of qualitative description was deemed most suitable for this research (Kim et al., 2017). The naturalistic perspective allows the researcher to observe participants in their natural state, allowing an inductive process to occur (Sandelowski, 2000).

Qualitative description suits this overall study as it aligns with the pragmatic approach, offers theory flexibility, and is often used for mixed methods research (Homer, 2017; Kim et al., 2017).

Qualitative description aims to provide a straightforward and detailed account of the participants'

discussions and perspectives, which means the researcher stays close to the data (Neergaard et al., 2009). This closeness to the data creates detailed accounts and precise records of events, which is useful for health professionals and policymakers (Sandelowski, 2000). The detailed account of the data is useful to answer the 'who, what, where, and why of experiences', which is important in this study as it aims to analyse a health system process and the decision-making of health professionals (Neergaard et al., 2009). Qualitative description is a useful tool when capturing information from people who are directly experiencing the phenomenon under investigation, especially when little is known about the phenomenon (Bradshaw et al., 2017). This is the case in this study, as data was gathered from people directly involved with the area of research, of which there is a scarcity and lack of understanding.

Qualitative description has been criticised by some researchers as being too simple and lacking theoretical rigor. However, researchers have been reporting the benefits of the analytical approach, specifically in health research. Neergaard et al. (2009) report that accurate use of the method is beneficial to analyse patient-health professional interaction and perspectives on health system functioning. Rigor is maintained if the researcher can stay close to the data and report accurate representation of the participants' perspectives (Milne & Oberle, 2005). Doyle et al. (2020) promote the use of qualitative description in health research as it creates accessible and clear findings that can directly inform healthcare policy (Doyle et al., 2020).

Data analysis – thematic analysis. Thematic analysis was used to analyse the raw data collected from the individual interviews. The thematic analysis technique provides a systematic process for generating, analysing, and defining patterns across a qualitative dataset to organise the data into a themed detailed account (Braun & Clarke, 2022a). Thematic analysis is an appropriate tool for data gathered by semi-structured interviews, as the method encourages the exploration of individuals' experiences to gain insight into the research problem/question (Kiger & Varpio, 2020). Thematic analysis is a flexible research tool with theoretical freedom, which allows the researcher to

adapt the analysis based on their theoretical standpoint (Braun & Clarke, 2012). This flexibility is important for a pragmatic mixed method study, which will take an abductive approach overall. This qualitative phase of analysis took an inductive approach, generating theory from the individual semi-structured interviews. Braun and Clarke (2012) describe this inductive approach to thematic analysis as a 'bottom-up' approach as codes and themes are exposed by the data. Importantly for this study, thematic analysis allows for an abductive approach, acknowledging that even with an inductive approach the researcher will bring some ideas formed by belief or earlier research (Braun & Clarke, 2012; Kiger & Varpio, 2020). This acknowledgment of the researcher's formed beliefs and theoretical assumptions is highlighted in Braun and Clarke's (2019) more recent publications on reflexive thematic analysis, which captures the researcher's important role in knowledge production. Themes are generated through an active process of the researcher's theoretical assumptions, prior knowledge, analytical skill, and the dataset itself (Braun & Clarke, 2019, 2022b)

The reflective thematic analysis was conducted using the six-phase process developed by Braun and Clarke (Braun & Clarke, 2022b). The primary researcher conducted the thematic analysis process, however at each stage, there was review and discussion with the primary supervisor. Both the researcher and supervisor were cognisant of their positionality to the topic and discussed this at each stage of analysis. The first phase included familiarisation with the data. The transcripts were read multiple times and initial notes were taken on each transcript about key reflections on each interview. The transcripts were then transferred into NVivo© to facilitate coding. Initial codes were manually generated based on data that may be related to the research question. These phrases or words that were related to the research question were marked and provided with a code name. Once the coding phase was completed, the codes were reviewed to identify any themes across the dataset. Initial themes were identified by reviewing the codes and identifying any shared meaning between groups of the codes. After the themes were identified, they were reviewed and consolidated to ensure they had a singular focus. The themes were then refined, ensuring each had a

strong core concept, and then named. Once these themes were decided, the results were written based on how these themes answered the research question.

Trustworthiness in the qualitative phase

Ensuring trustworthiness in the qualitative phase of this study is integral to the credibility and reliability of the findings. Trustworthiness in qualitative research can be broken down into the following components: credibility, transferability, dependability, and confirmability (Ahmed, 2024). Strategies were implemented to ensure the credibility of the findings, which included a comprehensive literature review to understand the current wider academic findings on the research topic, researcher reflexivity to acknowledge the researcher's prior knowledge and biases, and prolonged engagement with participants, which included building rapport and time to understand their perspectives accurately. To ensure transferability, sampling methods have been described, including inclusion and exclusion criteria. Interviews with health professionals also provided additional clinical context, which supplemented the data gathered from postnatal women. Methods of data collection and analysis have been clearly described to provide dependability. Finally, discussions and a peer review of the transcripts and thematic analysis with the researcher's supervisor provide confirmability of the findings.

Ethical considerations and approval

Ethics approval was granted by the Auckland University of Technology Ethics Committee (Ethics Committee) on 12 April 2022 (see Appendix 12). The original ethics approval was granted based on the second stage of the study utilising focus groups instead of individual interviews. Once it became apparent that focus groups would not be feasible due to scheduling challenges with willing participants, and that individual interviews would be better suited to the research, an amendment to the ethics application was submitted to the Ethics Committee. This amendment was approved by the Ethics Committee on 8 March 2024 (see Appendix 13).

There were several important ethical considerations within both phases of this study. Due to large volumes of data being collected in both phases, data security was paramount. All data and analysis files are stored in a password-protected folder on an isolated and password-protected internal server at the Auckland University of Technology. The server is only accessible to the internal university network, and only named researchers have access to the password-protected server and folder via a password-protected and user-logged workstation.

The qualitative phase of the study collected identifiable information. Potential participants saw a flyer for the research project and contacted the researcher independently. The potential participants were provided with an information sheet that outlined the research and the process of using their data. Participants' identifiable data was kept in a different file within the password-protected folder from the research outputs. Verbatim recordings were transcribed by an independent company who signed a confidentiality agreement. Transcripts were given a code number to ensure that no identifiable information was disclosed in the results.

The qualitative phase of the study included discussion of sensitive information. The topic of pelvic floor dysfunction within the postnatal period is distressing for some women, especially those who have experienced negative events such as a traumatic birth. Strategies were put in place to manage this risk, including: making it clear to participants that they only needed to disclose information they were comfortable discussing and that they could end the interview at any time, interviews were conducted at a time and location where participants were comfortable, and any emotional response was acknowledged during the interview (Barnard & Gerber, 2001).

There may have been a perceived conflict of interest between my researcher's role as a Doctoral researcher and my professional role as a Policy Manager at the Ministry of Health. This conflict was managed by providing information on my professional role through the participant information sheet. When participants asked about the researcher's professional role, I discussed the

boundaries of the role and the knowledge and interest of the study subject matter generated from professional experience.

Summary

This chapter has described the methodology and methods undertaken to implement this research. First, the chapter outlines the researcher's positionality to the research, generated from clinical and health policy experience and my experience as a woman and mother. The philosophical position of pragmatism guides the research, which provides a framework to develop practical solutions for complex problems, building on women's experience. The research uses a mixed methodology using a convergent design, providing a dualistic approach to answering the research questions. These research questions are answered via a retrospective cohort study and semi-structured individual interviews. Finally, ethical considerations are considered, which include strategies to protect confidential information, minimise distress to women sharing sensitive information, and reduce perceived bias from my professional career.

Chapter Five – Results (quantitative findings)

This chapter outlines the findings from the quantitative phase of the study. The results from the National Maternity Collection dataset are described first, followed by the results from the New Zealand Health Survey 2014/15.

National Maternity Collection

Demographics of dataset

Age of mother. A scatterplot of age of mother at birth was used to identify outliers (see Appendix 1). After studying the age distribution, a lower age limit of aged 12 and over and aged 48 and younger was established. Mothers outside of this age range were considered outliers and were not used in subsequent data analyses. The following results are only based on mothers between the ages of 12 and 48.

Table 2

Age distribution of mothers

Delivery year	Mean	SD	Median	Mode	Min	Max
2003	29.2	6.1	30	31	12	47
2004	29.2	6.1	30	32	12	47
2005	29.2	6.2	30	32	12	47
2006	29.2	6.2	30	33	13	47
2007	29.1	6.54	29	33	13	47
2008	29.1	6.29	29	31	13	47
2009	29.12	6.25	29	32	12	47
2010	29.11	6.22	29	31	12	47
2011	29.17	6.17	29	31	13	47
2012	29.20	6.12	29	31	13	47
2013	29.32	6.07	30	30	13	47
2014	29.43	5.93	30	31	12	47
2015	29.52	5.86	30	31	13	47
2016	29.66	5.73	30	31	12	47
2017	29.75	5.69	30	31	13	47
2018	29.86	5.61	30	30	14	47
2019	29.97	5.59	30	31	13	47

The mean age of mothers at the time of birth has slightly increased over the period between 2003 and 2019, beginning at 29.2 years in 2003, reducing to 29.0 in 2008, and then gradually increasing to 29.9 in 2019. The mean age across the period is 29.33 and the median age is 30 years old. The median age is 29 years for years 2007 to 2012 and then increases to 30 from 2013 to 2019. The year 2007 has the highest mode with an age of 33 years.

Ethnicity of mother. Data was provided by prioritised ethnicity and was recorded in the following order or priority: Māori, Pacific Peoples, Asian, Middle Eastern/Latin American/African, NZ European, or Other. Ethnicities were prioritised into single ethnic groups based on government ethnicity hierarchical guidance to be able to conduct inferential statistics, allowing comparison between ethnicity and other variables.

Table 3

Prioritised ethnicity of total dataset

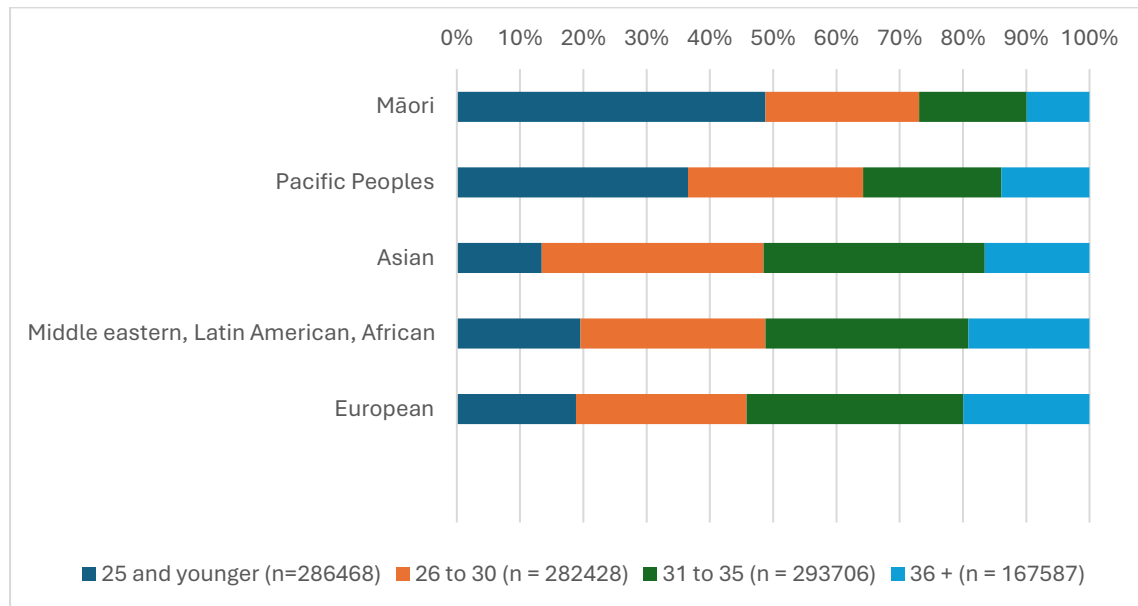
Prioritised ethnicity	n	%
Māori	264105	25.6
Pacific Peoples	114259	11.1
Asian	131067	12.8
Middle Eastern/Latin American/ African	20162	2.0
European	500596	48.6
Total	1030189	100
<i>missing</i>	1697	

Age of mother at time of birth by ethnic group. The age of mothers varied between ethnic groups. Age was collapsed into four categories, using the 25th, 50th, and 75th quartiles to facilitate the interpretation of results pertaining to the difference between ages of mothers within ethnicity groups. Between 2002 and 2019, Māori and Pacific Peoples seem to have a larger proportion of

mothers who gave birth at a younger age (mostly under the age of 25) than European, Asian and Middle Eastern/Latin American/African ethnicities (see Figure 6).

Figure 6

Percentage distribution of age (quartiles) within prioritised ethnic group



Body Mass index of mother. BMI was recorded at the initial LMC visit. Body Mass Index data is missing from the year 2003 to 2006 and therefore, we have 34% missing data for BMI. Results pertaining to BMI only include data from 2007. Outliers were identified after studying the distribution of recorded BMI. A lower BMI limit of 15 and upper limit of 49 was established (Nutall, 2015). Mothers with a BMI outside of this range were considered outliers and not included in any subsequent analyses related to BMI.

Table 4*Body Mass Index (BMI) distribution of mothers*

Year of delivery	Mean	SD	Median	Mode	Min	Max
2007	26.07	5.61	24	24	15	49
2008	25.81	5.54	24	23	15	49
2009	25.91	5.59	25	22	15	49
2010	25.97	5.63	25	24	15	49
2011	26.13	5.77	25	24	15	49
2012	26.15	5.80	25	24	15	49
2013	26.30	5.89	25	23	15	49
2014	26.33	5.93	25	22	15	49
2015	26.43	5.98	25	22	15	49
2016	26.42	6.02	25	22	15	49
2017	26.57	6.03	25	23	15	49
2018	26.70	6.05	25	24	15	49
2019	26.81	6.15	25	24	15	49

Table 5*Frequencies and percentages of Body Mass Index levels*

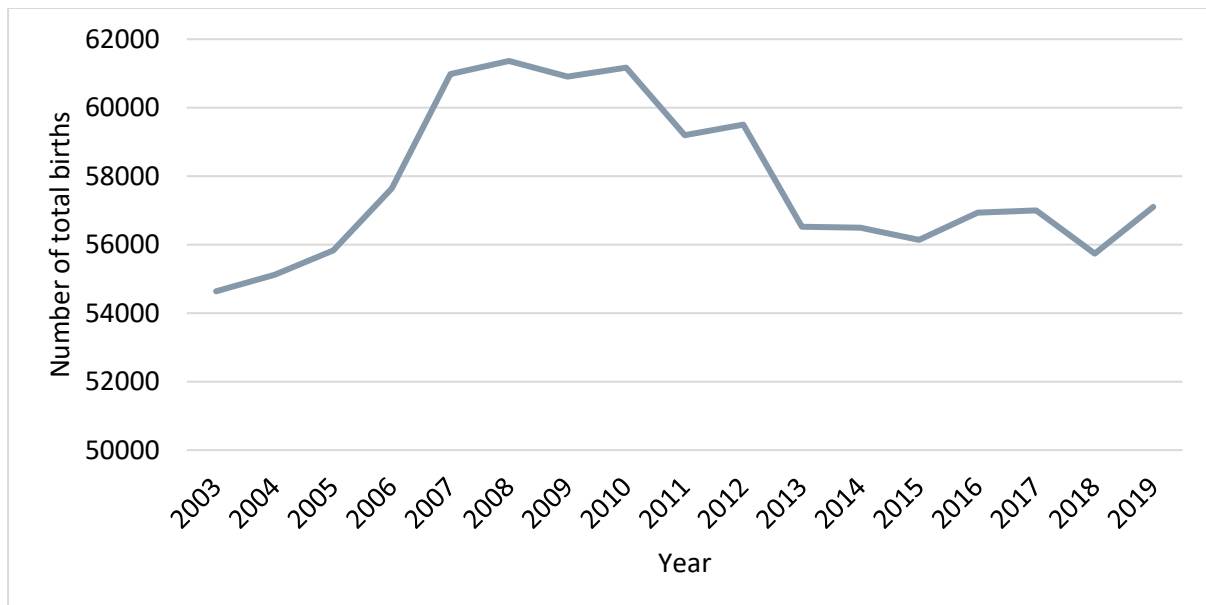
BMI	n	%
Underweight	19178	2.8
Healthy weight	305365	44.6
Overweight	193166	28.2
Obese	167536	24.4
Total	685245	100.0
<i>missing</i>	346645	

Number of births. Total number of annual births has increased over the period 2003 to 2019.

The total number of births was 54638 in 2003, which rose to a peak in 2008 with 61365 births that year, and then decreased again to stabilise from 2013 -2019, with 57106 births in 2019.

Figure 7

Number of births per year between 2003 and 2019



Mode of delivery

The descriptive trends in modes of delivery among women in the years 2003 to 2019 were studied, focusing on Caesarean births, Spontaneous vaginal births, and Assisted births. Over the period 2003 to 2019, there has been a shift in these modes of delivery. Referring to Table 6, the combined variable 'Caesarean births', which includes both emergency and elective caesarean sections as defined by the National Maternity Collection, shows a steady increase from 12642 births (5.0% of total caesarean sections across the dataset) in 2003 to 17,225 births (6.8% of total caesarean sections across the dataset) in 2019. Note that from 2003 to 2019, when considering modes within a year, the proportion of caesarean sections increased from 23.2% to 30.2% of total births in 2003 and 2019, respectively, indicating a shift of approximately 7% towards surgical interventions. In contrast, when considering modes within a year, the number of spontaneous vaginal births has decreased, with 36634 births recorded in 2003 (67.3% of total births that year)

dropping to 33350 births (58.4% of total births in 2019). The number of assisted vaginal deliveries, which includes methods like assisted breech, forceps delivery, and vacuum delivery, has remained relatively stable.

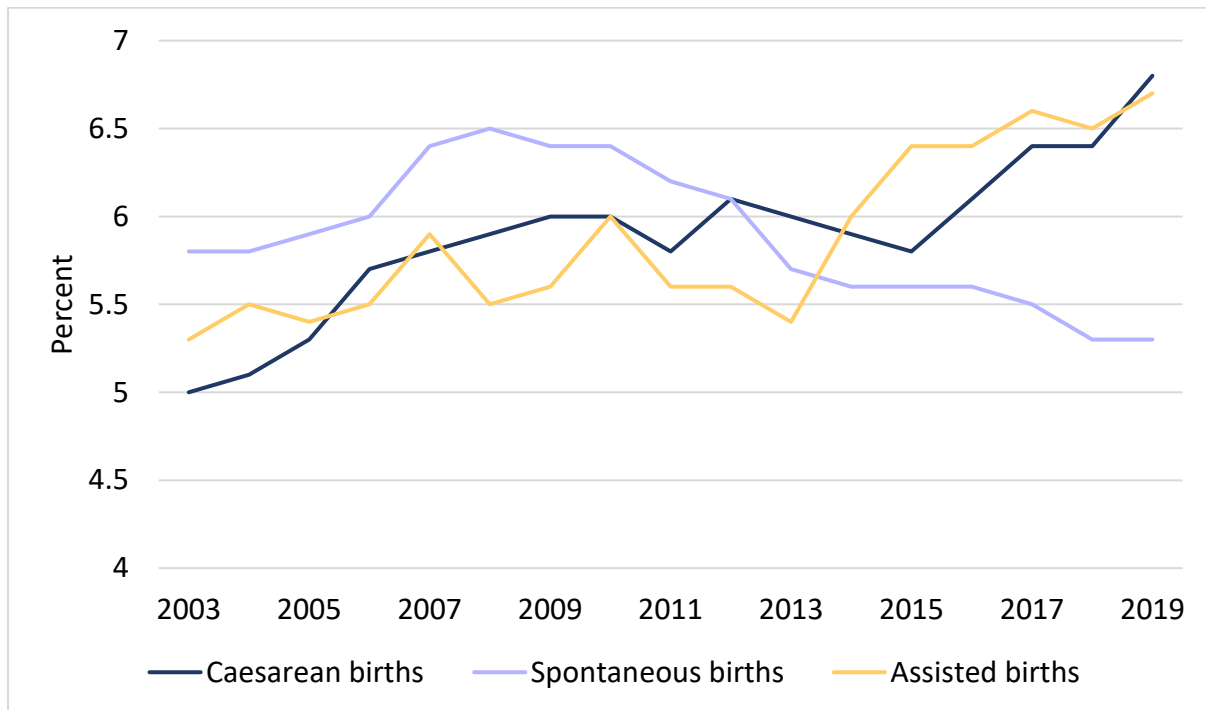
Table 6

Number of caesarean, spontaneous, and assisted births that occurred each year, percentages show proportion within each mode, not within each year

Year of birth	Caesarean births		Spontaneous births		Assisted births		Total	
	n	%	n	%	n	%	n	%
2003	12642	5.0	36631	5.8	5134	5.3	54410	5.6
2004	13059	5.1	36364	5.8	5404	5.5	54827	5.6
2005	13384	5.3	36913	5.9	5290	5.4	55587	5.7
2006	14428	5.7	37390	6.0	5383	5.5	57201	5.8
2007	14861	5.8	39920	6.4	5731	5.9	60512	6.2
2008	14930	5.9	40769	6.5	5385	5.5	61084	6.2
2009	15197	6.0	39801	6.4	5511	5.6	60509	6.2
2010	15187	6.0	39792	6.4	5814	6.0	60793	6.2
2011	14820	5.8	38533	6.2	5483	5.6	58836	6.0
2012	15524	6.1	38401	6.1	5488	5.6	59413	6.1
2013	15217	6.0	35800	5.7	5232	5.4	56249	5.7
2014	15066	5.9	35382	5.6	5896	6.0	56344	5.8
2015	14853	5.8	35050	5.6	6224	6.4	56127	5.7
2016	15617	6.1	35009	5.6	6292	6.4	56918	5.8
2017	16399	6.4	34154	5.5	6437	6.6	57990	5.9
2018	16369	6.4	32978	5.3	6378	6.5	55725	5.7
2019	17225	6.8	33347	5.3	6523	6.7	57095	5.8
Total	254778	100	6262234	100	97605	100	978617	100

Figure 8

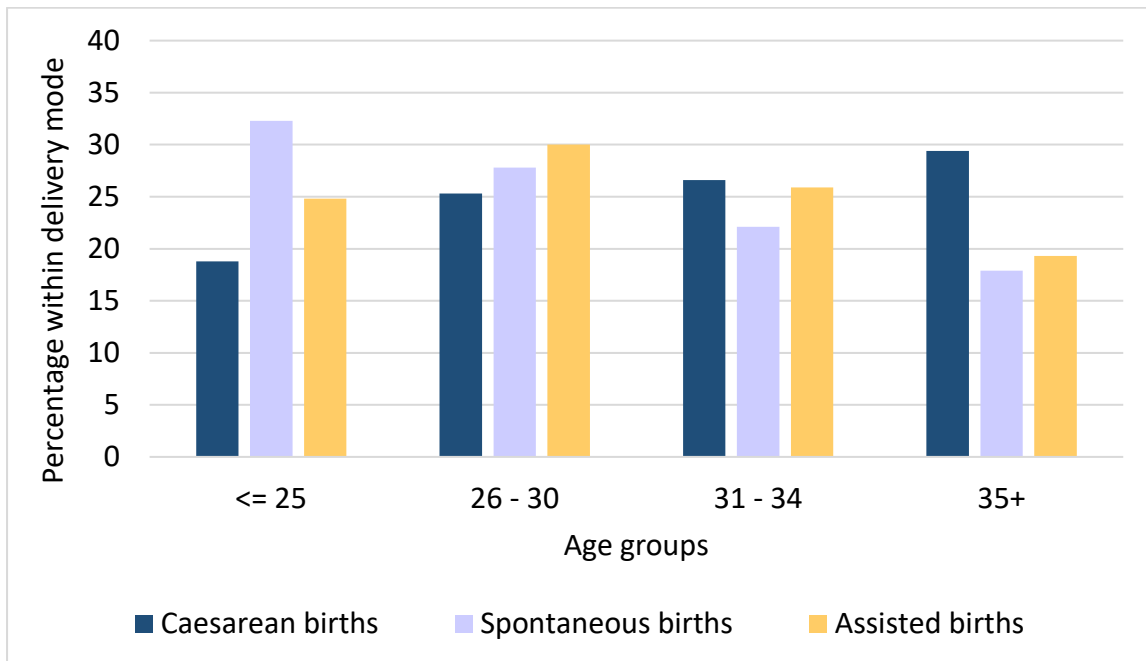
Percentage within each mode of delivery by year from 2003 to 2019



Mode of delivery, age, and ethnicity of mother. By observing the percentage of the different age groups of the mothers, as well as their ethnic groups and the type of birth that they had, it seems that there are differences (see Figure 9 and Figure 10). For example, spontaneous birth was the most common in women aged under 25 years and the least common in women over 35 years. For caesarean birth, the opposite trend is observed, with caesarean section most common in those over 35 and least common in those under 25 years. Assisted delivery was most common in the 26 to 30 age group. Women's ethnicity was also observed to be related to birth type, with Māori women having the highest proportion of spontaneous births and Asian women the least. Middle Eastern/Latin American/African women had the highest proportion of caesarean sections, with Māori women the least. Asian women had the highest proportion of assisted births.

Figure 9

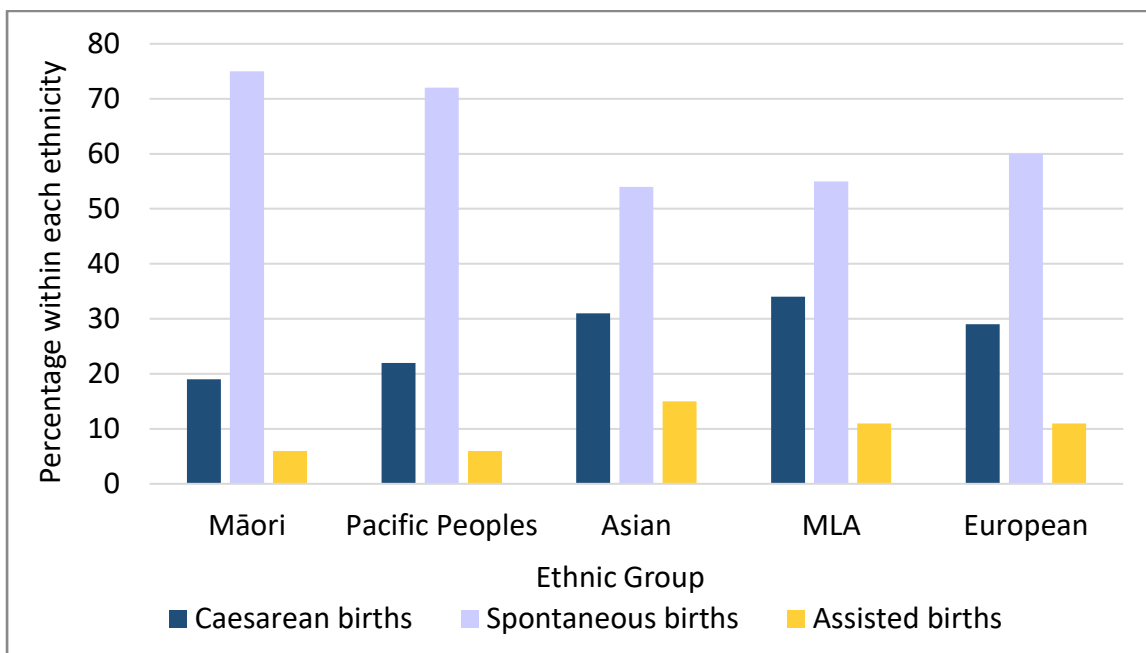
Percentage of each delivery mode that occurs in each age group



Note. Percentages sum across delivery mode.

Figure 10

How delivery modes vary within each ethnicity



Note. Percentages sum within ethnic group. MLA is Middle Eastern, Latin American, African.

To test whether there is an association between the age of the mother at the time of delivery and mode of delivery, and between ethnicity and mode of delivery, a multiple logistic regression was conducted entering both age (<25 as reference) and ethnicity (NZ European as reference) as possible predictors of each mode of delivery. An interaction between age and ethnicity was also tested. Age was collapsed into four categories, using the 25th, 50th, and 75th quartiles, and prioritised ethnicity was used.

Ethnicity, age of mother, and spontaneous births. The logistic regression model revealed that age and ethnicity and significant predictors of spontaneous births. Compared to the reference group (age under 25), all women in the older age groups had significantly reduced odds of spontaneous birth (0.74, 0.62, and 0.50, respectively). Ethnicity also played a significant role, with Māori and Pacific Peoples women having higher odds of spontaneous birth compared to European women (the reference group), of 1.46 and 1.40, respectively. The interaction terms indicated that the effect of age on spontaneous birth varied by ethnicity. For example, the odds of spontaneous birth for Pacific women aged 35 and older were 23% higher than European women of the same age group (OR = 1.23, $p < .001$). According to the results it seems that Pacific Peoples mothers, as well as Māori mothers, have higher odds of having a spontaneous birth when they are older than 25 compared to NZ European mothers (see Table 7).

Table 7

Multiple logistic regression results ethnicity and age (spontaneous births as outcome)

Predictors	Proportion	Odds ratio	95% CI	p-value
Age	% within age groups who had a spontaneous birth			
(reference) < = 25	73.4			
26 to 30	64.7	0.74	0.72, 0.80	<.001
31 to 34	59.5	0.62	0.61, 0.63	<.001
35 and older	54.2	0.50	0.5, 0.6	<.001

Ethnicity	% within ethnicity groups who had a spontaneous birth				
(reference) NZ European	59.4				
Māori	74.4	1.46	1.40, 1.61	<.001	
Pacific Peoples	71.3	1.40	1.36, 1.44	<.001	
Asian	53.9	0.87	0.76, 0.88	<.001	
MLA	54.6	0.86	0.75, 0.87	<.001	
Age and ethnicity interaction	% ethnicity*age who had a spontaneous birth				
Māori aged 26 to 30	74.5	1.09	1.09, 1.16	<.001	
Māori aged 31 to 34	70.4	1.07	1.07, 1.14	<.001	
Māori aged 35 and older	65.8	1.07	1.06, 1.18	<.001	
Pacific Peoples aged 26 to 30	71.9	1.14	1.08, 1.16	<.001	
Pacific Peoples aged 31 to 34	68.3	1.16	1.09, 1.18	<.001	
Pacific Peoples aged 35 and older	64.6	1.23	1.18, 1.28	<.001	
Asian aged 26 to 30	55.5	0.97	0.93, 1.01	.22	
Asian aged 31 to 34	52.6	0.99	0.99, 1.08	.72	
Asian aged 35 and older	47.3	1.05	1.03, 1.12	.04	
MLA aged 26 to 30	58.3	1.07	0.97, 1.16	.17	
MLA aged 31 to 34	51.7	0.99	0.89, 1.06	.88	
MLA aged 35 and older	45.8	0.99	0.90, 1.07	.82	

Note 1. MLA is Middle Eastern, Latin American, and African, *Note 2.* Without any predictors in the model.

Ethnicity, age of mother, and caesarean births. For all the age groups older than 25 there were significant increased odds of having a caesarean birth compared to the mothers younger than age 25. Mothers older than 35 had twice the odds of having a caesarean birth (odds ratio = 2.44).

Māori and Pacific Peoples mothers had a reduced odds of having a caesarean birth compared to NZ

European mothers, while mothers from the Middle East, Latin America, or Africa had slightly more odds (17%) than NZ European mothers of having a caesarean birth. Results of the interactions between age and ethnicity showed that Māori mothers aged 31 and more had slightly significantly less odds of having a caesarean than NZ European mothers of the same age, while Asian mothers aged 26 and older had higher odds (11% to 19%) of having a caesarean than NZ European mothers of the same age (see Table 8).

Table 8

Multiple logistic regression results ethnicity and age (caesarean births as outcome)

Predictors	Proportion	Odds ratio	95% CI	p-value
Age	% within age groups who had a caesarean birth			
(reference) < = 25	17.4			
26 to 30	24.1	1.36	1.33, 1.39	<.001
31 to 34	29.2	1.70	1.67, 1.74	<.001
35 and older	36.3	2.44	2.39, 2.49	<.001
Ethnicity	% within ethnicity groups who had a caesarean birth			
(reference) NZ European	28.9			
Māori	19.0	0.72	0.70, 0.74	<.001
Pacific Peoples	21.8	0.79	0.76, 0.81	<.001
Asian	31.3	1.01	0.99, 1.08	.62
MLA	33.9	1.17	1.13, 1.32	<.001
Age and ethnicity interaction	% ethnicity*age who had a caesarean birth			
Māori aged 26 to 30	19.6	0.98	0.97, 1.03	.36
Māori aged 31 to 34	23.3	0.96	0.95, 1.02	<.001
Māori aged 35 and older	28.3	0.91	0.86, 0.93	<.001

Pacific Peoples aged 26 to 30	21.2	1.03	0.97, 1.05	.18
Pacific Peoples aged 31 to 34	25.4	1.03	0.97, 1.06	.19
Pacific Peoples aged 35 and older	30.3	0.96	0.87, 0.96	.06
Asian aged 26 to 30	27.4	1.11	1.03, 1.13	<.001
Asian aged 31 to 34	33.3	1.19	1.08, 1.19	<.001
Asian aged 35 and older	41.2	1.18	1.06, 1.18	<.001
MLA aged 26 to 30	29.6	1.07	0.92, 1.12	.21
MLA aged 31 to 34	37.6	1.20	1.05, 1.27	<.001
MLA aged 35 and older	43.4	1.13	0.93, 1.14	<.001

Note. Without any predictors in the model.

Ethnicity, age of mother, and assisted births. As with the other two types of births, the results of the multiple logistic regression showed that variance in assisted births was explained by age and ethnicity, as well as the interaction between the two, as there is a reduction in deviance from the null model (from 645239 to 633764).

Compared to the reference group (age under 25), overall all women (regardless of ethnicity) aged 26 to 30 and 31 to 34 had *increased* odds (11% and 15%, respectively) of an assisted delivery birth (OR = 1.11, $p < .001$, and OR = 1.15, $p < .001$), but women aged 35 and older had 5% *less* odds of having an assisted delivery birth (OR 0.95, $p < .001$). Ethnicity also played a significant role, with Māori women and Pacific Peoples women (despite their age) having lower odds of an assisted delivery birth compared to NZ European women (OR = 0.61, $p < .001$; 0.68, $p < .001$), while Asian mothers had 46% higher odds of having an assisted birth (than NZ European women). The interaction terms indicated that the effect of age on assisted delivery birth varied by ethnicity. For instance, Pacific women aged 35 and older were 34% less likely than European women of the same age to have an assisted birth (OR = 0.66, $p < .001$). In fact, all other ethnic groups within all age bands were less likely than the NZ European equivalent age bands to have an assisted delivery birth. As the main

effect of ethnicity indicated that Asian women have a higher likelihood to have an assisted birth than NZ European women, the results of the interaction show that it is the women 25 years old and younger (baseline category) of Asian ethnicity that are having more assisted births, and that older Asian women have progressively lower odds compared to older NZ European women. (see Table 9).

Table 9

Multiple logistic regression results ethnicity and age (assisted births as outcome)

Predictors	Proportion	Odds ratio	95%CI	p-value
Age				
	% within age groups who had a caesarean birth			
(reference) < = 25	8.8			
26 to 30	10.9	1.16	1.13, 1.19	<.001
31 to 34	10.9	1.15	1.11, 1.17	<.001
35 and older	9.1	0.95	0.91, 0.96	<.001
Ethnicity				
	% within ethnicity groups who had a caesarean birth			
(reference) NZ European	11.4			
Māori	6.2	0.61	0.57, 0.61	<.001
Pacific Peoples	6.4	0.68	0.63, 0.69	<.001
Asian	14.5	1.46	1.44, 1.58	<.001
MLA	11.4	1.24	1.04, 1.27	<.001
Age and ethnicity interaction				
Māori aged 26 to 30	5.6	0.70	0.68, 0.75	<.001
Māori aged 31 to 34	6.0	0.72	0.74, 0.83	<.001
Māori aged 35 and older	5.6	0.83	0.83, 0.94	<.001
Pacific Peoples aged 26 to 30	6.4	0.77	0.70, 0.79	<.001
Pacific Peoples aged 31 to 34	5.8	0.68	0.63, 0.74	<.001
Pacific Peoples aged 35 and older	4.8	0.66	0.66, 0.73	<.001

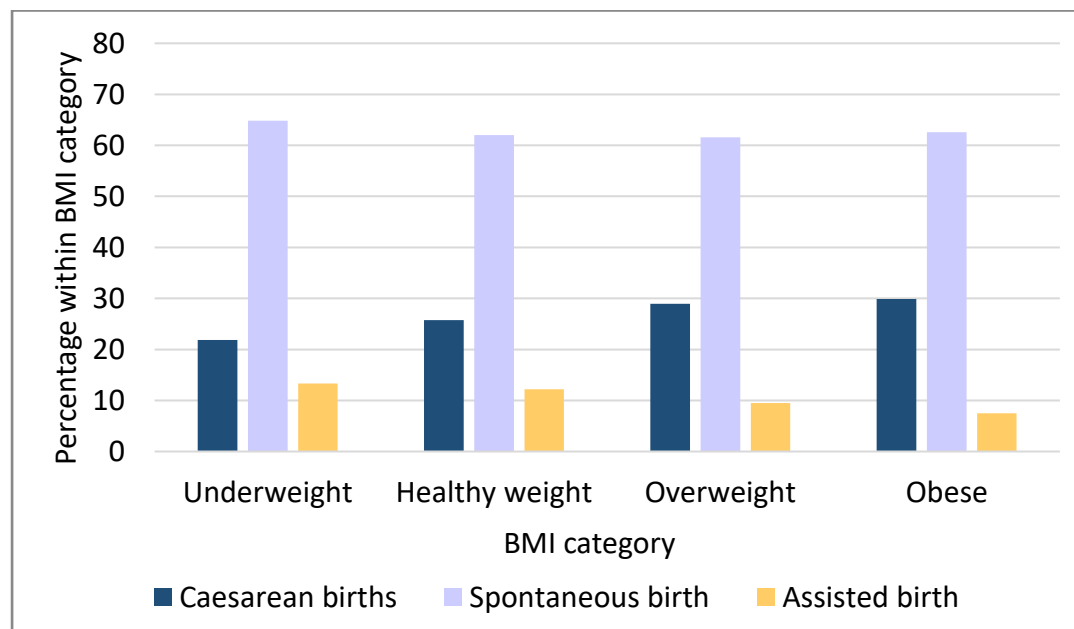
Asian aged 26 to 30	16.8	0.95	0.90, 1.01	<.001
Asian aged 31 to 34	13.8	0.77	0.72, 0.81	<.001
Asian aged 35 and older	11.2	0.74	0.68, 0.78	<.001
MLA aged 26 to 30	11.7	0.82	0.72, 0.93	<.001
MLA aged 31 to 34	10.4	0.70	0.64, 0.84	<.001
MLA aged 35 and older	10.5	0.81	0.78, 1.03	<.001

Note. Without any predictors in the model.

Mode of delivery, BMI of mother, and age. Studying the overall pattern of proportions from 2007 to 2019 (see Figure 11), note that slightly smaller proportions of healthy weight, overweight, and obese mothers are having spontaneous births. These three BMI categories seem to be having more caesarean births compared to women who are underweight. When it comes to assisted births, a larger proportion of underweight women had this mode of delivery.

Figure 11

Percentage of each mode of delivery by BMI category



To examine the association between a woman's mode of delivery and her BMI, as well as the potential interaction with age, a multiple logistic regression analysis was conducted. The model

included four BMI categories (with underweight designated as the reference group) and included the four age quartiles (From 2007 to 2019), using women younger than 25 years as the reference group.

BMI, age of mother, and spontaneous births.

BMI and age of mother are significant predictors of spontaneous births. Mothers with a healthy weight are 7% more likely to experience a spontaneous birth compared to underweight mothers (odds ratio = 1.07). In contrast, obese women are 17% less likely to have a spontaneous birth (odds ratio = 0.83). Interestingly, among healthy weight women, those older than 26 are less likely to have a spontaneous birth. Additionally, overweight women over 31 also have a decreased likelihood of spontaneous birth, as indicated by odds ratios below 1.00. Conversely, obese women in this age group show a slight increased likelihood of spontaneous birth (compared to underweight women of the same age), reflected by odds ratios above 1.00.

Table 10

Multiple logistic regression results BMI and age (spontaneous births as outcome)

Predictors	Proportion	Odds ratio	95% CI	p-value
Age	% within age groups who had a spontaneous birth			
(reference) <= 25	70.0			
26 to 30	61.1	0.66	0.6, 0.7	<.001
31 to 34	56.2	0.58	0.5, 0.6	<.001
35 and older	51.0	0.48	0.4, 0.5	<.001
BMI	% within BMI groups who had a spontaneous birth			
(reference) Underweight	62.3			
Healthy weight	60.0	1.07	1.0, 1.1	0.04
Overweight	60.0	1.02	1.0, 1.1	0.60
Obese	60.7	0.83	0.8, 0.9	<.001

Age and BMI interaction	% BMI*age who had a spontaneous birth			
Healthy weight aged 26 to 30	60.6	0.94	0.9, 1.0	0.12
Healthy weight aged 31 to 34	55.9	0.87	0.8, 0.9	<.001
Healthy weight aged 35 and older	51.2	0.85	0.8, 0.9	<.001
Overweight aged 26 to 30	61.0	1.01	0.9, 1.1	0.78
Overweight aged 31 to 34	55.5	0.89	0.8, 1.0	0.01
Overweight aged 35 and older	49.7	0.83	0.8, 0.9	<.001
Obese aged 26 to 30	61.8	1.20	1.1, 1.3	<.001
Obese aged 31 to 34	57.4	1.13	1.0, 1.2	0.01
Obese aged 35 and older	51.5	1.08	1.0, 1.2	0.15

BMI, age of mother, and caesarean births. Results indicate that women who are either a healthy weight, overweight, or obese, all have a higher likelihood (odds ratio above 1.00) of having a caesarean birth than women who are underweight, with mothers who are obese having more than 87% odds. Results of the interaction with age show that for those women who are obese, but who are older than 25, the likelihood of having a caesarean is lower than underweight women of the same age groups. Therefore, it seems that women who are obese are having caesarean births when they are 25 years or younger. It seems to be that healthy weight and overweight women aged 31 to 34 years have a significantly higher likelihood of having a caesarean than underweight women in the same age group.

Table 11

Multiple logistic regression results BMI and age (caesarean birth as outcome)

Predictors	Proportion	Odds ratio	95% CI	p-value
Age	% within age groups who had a caesarean birth			
< = 25	17.1			

	26 to 30	23.1	1.53	1.4, 1.7	<.001
	31 to 34	28.0	1.85	1.7, 2.0	<.001
	35 and older	34.9	2.72	2.4, 3.0	<.001
BMI		% within BMI groups who had a caesarean birth			
	Underweight	19.2			
	Healthy weight	23.0	1.11	1.0, 1.2	0.01
	Overweight	25.9	1.33	1.2, 1.4	<.001
	Obese	27.9	1.87	1.7, 2.0	<.001
Age and BMI interaction		% BMI*Age who had a caesarean birth			
	Healthy weight aged 26 to 30	20.6	1.03	0.9, 1.1	0.62
	Healthy weight aged 31 to 34	25.6	1.14	1.0, 1.3	0.02
	Healthy weight aged 35 and older	32.3	1.08	1.0, 1.2	0.18
	Overweight aged 26 to 30	23.7	1.02	0.9, 1.1	0.75
	Overweight aged 31 to 34	29.6	1.15	1.0, 1.3	0.01
	Overweight aged 35 and older	36.7	1.09	1.0, 1.2	0.14
	Obese aged 26 to 30	27.2	0.89	0.8, 1.0	0.02
	Obese aged 31 to 34	32.0	0.91	0.8, 1.0	0.10
	Obese aged 35 and older	38.6	0.81	0.7, 0.9	0.00

BMI, age of mothers, and assisted births. Results of the logistic regression on assisted births indicate that women who are a healthy weight, overweight, and obese, are all significantly less likely to have an assisted birth than women who are underweight, as indicated by the odds ratios that are less than 1.00 (see Table 12). The only significant interaction found was for mothers who are obese and older than 26 years. Results show that they are significantly less likely to have an assisted birth

compared to underweight women of the same age groups. Overall, it seems that underweight women, regardless of age, have a higher likelihood to have an assisted birth.

Table 12

Multiple logistic regression results BMI and age (assisted birth as outcome)

Predictors	Proportion	Odds ratio	95% CI	p-value
Age	% within age groups who had an assisted birth			
< = 25	8.7			
26 to 30	10.8	1.32	1.2, 1.5	<.001
31 to 34	10.7	1.31	1.2, 1.5	<.001
35 and older	8.9	1.01	0.9, 1.2	0.9
BMI	% within BMI groups who had an assisted birth			
Underweight	13.7			
Healthy weight	11.7	0.78	0.7, 0.8	<.001
Overweight	9.3	0.65	0.6, 0.7	<.001
Obese	6.7	0.55	0.5, 0.6	<.001
Age and BMI interaction	Within BMI groups who had an assisted birth			
Healthy weight aged 26 to 30	13.2	1.07	1.0, 1.2	0.2
Healthy weight aged 31 to 34	12.8	1.04	0.9, 1.2	0.52
Healthy weight aged 35 and older	10.4	1.09	0.9, 1.3	0.24
Overweight aged 26 to 30	10.1	0.90	0.8, 1.0	0.07
Overweight aged 31 to 34	9.8	0.88	0.8, 1.0	0.05
Overweight aged 35 and older	8.6	0.97	0.8, 1.1	0.7
Obese aged 26 to 30	7.1	0.71	0.6, 0.8	<.001
Obese aged 31 to 34	6.8	0.68	0.6, 0.8	<.001
Obese aged 35 and older	6.6	0.79	0.7, 0.9	<.001

Perineal tears

Descriptively, the trend of perineal tears changed over the 2003 to 2019 period. Since 2003, more women experienced some form of perineal tear during birth (first to fourth degree tears). In 2003, 25.3% (n = 13721) of birthing women had a perineal tear. By 2019, the proportion of birthing women who had a perineal tear increased to 30.2% (n=17148).

The type of tear is also changing. From 2003 to 2019, the rate of first-degree tears have reduced, while the rates of second and third degree tears has increased. Fourth degree tears have remained relatively static over this period.

Table 13

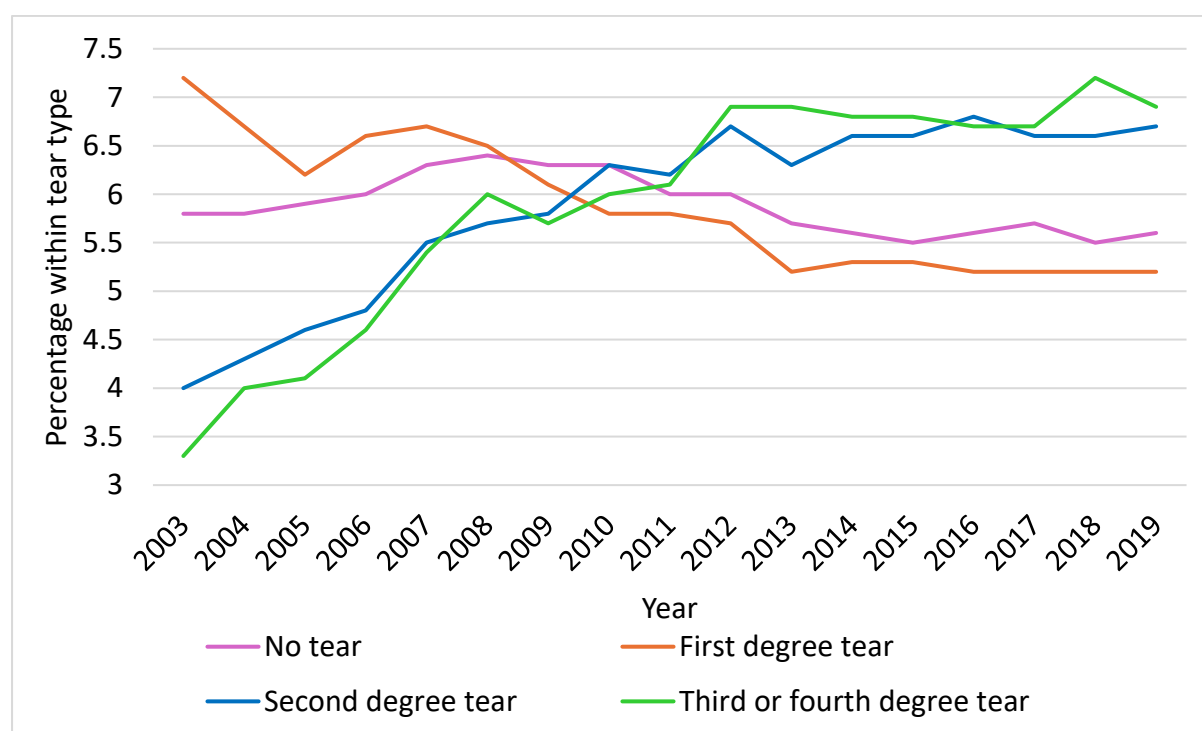
Number of tears (n) by year and degree of tear and percentage (%) within that tear type over the entire period from 2003 to 2019

Year	First degree tear		Second degree tear		Third degree tear		Fourth degree tear		Total	
	n	%	n	%	n	%	n	%	n	%
2003	6399	7.2	6735	4	536	3.2	51	3.9	13721	5.0
2004	5985	6.7	7224	4.3	647	3.9	65	4.9	13921	5.1
2005	5529	6.2	7675	4.6	665	4	72	5.5	13941	5.1
2006	5832	6.6	7995	4.8	749	4.5	69	5.3	14645	5.3
2007	5944	6.7	9178	5.5	875	5.3	86	6.5	16083	5.9
2008	5819	6.5	9540	5.7	1002	6	67	5.1	16428	6.0
2009	5452	6.1	9707	5.8	953	5.7	78	5.9	16190	5.9
2010	5126	5.8	10492	6.3	1005	6	79	6	16702	6.1
2011	5129	5.8	10422	6.2	998	6	100	7.6	16649	6.1
2012	5038	5.7	11167	6.7	1154	6.9	91	6.9	17450	6.4
2013	4639	5.2	10589	6.3	1148	6.9	95	7.2	16471	6.0
2014	4738	5.3	11034	6.6	1147	6.9	69	5.3	16988	6.2

2015	4722	5.3	11007	6.6	1149	6.9	75	5.7	16953	6.2
2016	4642	5.2	11478	6.8	1127	6.8	77	5.9	17324	6.3
2017	4597	5.2	11032	6.6	1126	6.8	81	6.2	16836	6.1
2018	4616	5.2	11149	6.6	1193	7.2	91	6.9	17049	6.2
2019	4660	5.2	11257	6.7	1163	7	68	5.2	17148	6.2
Total	88867	100	167681	100	16637	100	1314	100	274499	100

Figure 12

Percentage within tear type by year for each degree of tear, from 2003 to 2019



Associations between degree of perineal tear and mode of delivery. To examine the association between mode of delivery and the degree of perineal tear, univariate logistic regression analyses were conducted. In each analysis, a degree of tear was entered as the outcome variable, while delivery modes – spontaneous birth, caesarean section, and assisted birth – were entered as predictors.

In the first analysis, the outcome was a first degree tear. Women who had a spontaneous birth were over nine times more likely to experience a first degree tear (odds = 9.6, $p < .001$), while those with an assisted birth were more than six times as likely (odds = 6.59, $p < .001$). By contrast, women who had a caesarean section were 92% less likely to have a first degree tear. See Table 14

In the second analysis, with second degree tears as the outcome, women who had a spontaneous birth were more than 11 times as likely to experience this degree of tearing (odds = 11.5), and those with an assisted birth were over 14 times as likely (odds = 14.28, $p < .001$). Caesarean section reduced the likelihood of a second degree tear by 98% (odds = 0.02).

Finally, in the third analysis, with third or fourth degree tears as the outcome, spontaneous birth increased the likelihood of this severe tearing over four times (odds = 4.2, $p < .001$), while assisted birth increased it more than 20 times (odds = 20.44, $p < .001$). Women who had a caesarean section were 99% less likely to experience a third or fourth degree tear (odds = 0.01, $p < .001$).

These results, detailed in Table 14, highlight significant differences in tear risk across delivery modes, with caesarean sections associated with substantially lower risks of perineal tears across all degrees compared to spontaneous or assisted deliveries.

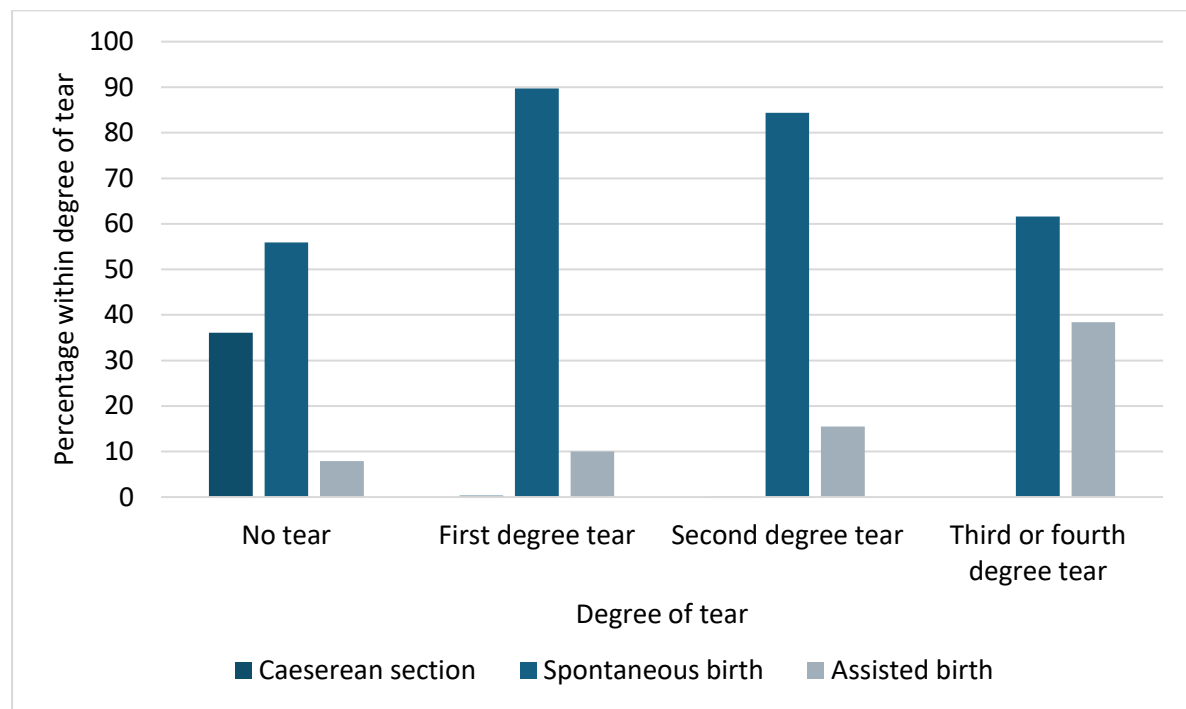
Table 14

Univariate logistic regression results, mode of delivery, and degree of tear

Mode of delivery	First degree tear			Second degree tear			Third/fourth degree tears		
	Odds ratio	95% CI	p-value	Odds ratio	95% CI	p-value	Odds ratio	95% CI	p-value
Spontaneous birth	9.60	9.0, 10.3	<.001	11.50	10.9, 12.2	<.001	4.87	4.2, 5.6	<.001
Caesarean birth	0.08	0.07, 0.09	<.001	0.02	0.01, 0.03	<.001	0.01	0.0, 0.2	<.001
Assisted birth	6.59	6.1, 7.1	<.001	14.28	13.5, 15.1	<.001	20.44	17.7, 23.6	<.001

Figure 13

Tear populations by mode of delivery

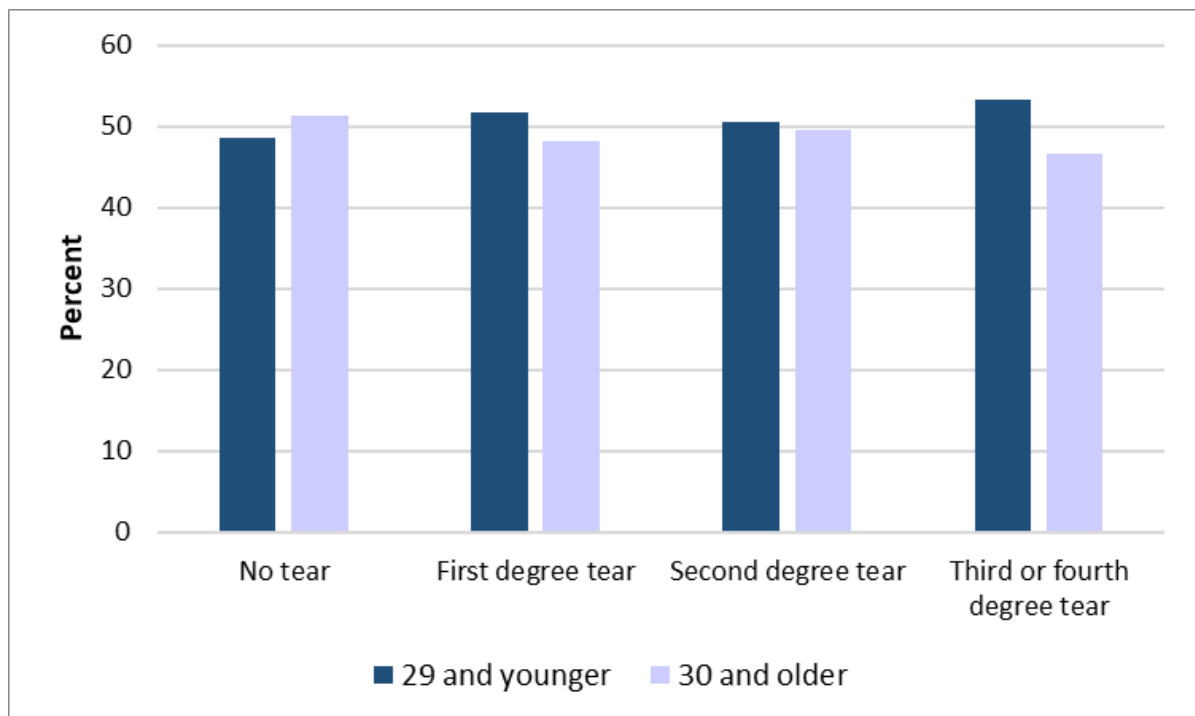


Age and degree of tear

To assess the relationship between maternal age and the degree of tear, an ordinal logistic regression was conducted with the ordinal levels of tears (from no tear to third/fourth degree) entered as outcome. Age was dichotomised into two categories based on the median age at time of birth (women 29 and younger = 0, and women aged 30 and older = 1). Results showed that women who were 30 years and older had a significantly ($p < .001$) lower likelihood of having a higher degree of tear (odds ratio = 0.91, 95%CI) [0.90, 0.92) compared to women 29 and younger.

Figure 14

Percentage of age within degree of tear



BMI and degree of tear

Results of an ordinal logistic regression entering the four levels of BMI as predictor (underweight as the reference), and the degree of tears as outcome, showed that women who have a healthy weight, who are overweight, and who are obese, all have significantly ($p < .001$) less odds of having a higher degree of tear than women who are underweight. Women who have a healthy weight are 34% less likely (odds ratio = 0.66, 95%CI) [0.65, 0.68]; women who are overweight are 22% less likely (odds

ratio = 0.78, 95%CI) [0.76, 0.80], and women who are obese are 13% less likely (odds ratio = 0.87, 95%CI) [0.87, 0.92].

Summary of findings

Between 2003 and 2019 there has been a change in the mode of delivery in New Zealand. More women are having caesarean section births and assisted deliveries, and less women are having spontaneous vaginal births. In addition to changing mode of delivery, the amount and severity of perineal tears are also changing.

In 2019, 30.2% of birthing women experienced a perineal tear, which has increased from 25.3% in 2003. Alongside the proportion of women experiencing a tear increasing, the type of tear is also changing, with more severe tears increasing. The data shows a trend that indicates that first degree tears are reducing, and second and third degree tears are increasing. Fourth degree tears remained stable over the time period.

Between 2003 and 2019, age and ethnicity played a significant role in mode of delivery. Younger women were more likely to have a spontaneous delivery, with the older age groups more likely to have a caesarean section. Women aged between 26 and 34 were the most likely to have an assisted delivery.

Ethnicity also had an impact on mode of delivery, with Māori and Pacific women more likely than NZ European women to have a spontaneous vaginal delivery than caesarean section. The interaction terms indicated that the effect of age on spontaneous vaginal birth varied by ethnicity. For example, Māori and Pacific women aged 35 and older were more likely to have a spontaneous vaginal delivery than NZ European women of the same age. In contrast, Māori and Pacific women were less likely to have a caesarean birth compared to NZ European women of the same age, but Asian women were more likely to have a caesarean birth than their NZ European counterparts. Similarly, Māori and Pacific women were less likely than NZ European women to have an assisted delivery despite their age, whereas Asian women aged between 26 and 30 years were more likely than NZ European women to have an assisted delivery in the same age group.

A woman's BMI affects her mode of delivery. Compared to underweight women, women with a healthy weight or overweight were more likely to have a spontaneous delivery, and obese women were less likely. For caesarean section delivery, all BMI categories were more likely to have a caesarean section than underweight mothers. Underweight mothers were the most likely group to have an assisted delivery.

The findings have shown that mode of delivery is associated with perineal tears. Women who had a caesarean section are most likely to have no tear, whereas women who had a spontaneous vaginal delivery are most likely to have a first or second degree tear, while women who had an assisted vaginal delivery are more likely to have a third or fourth degree tear. Within all tear types, women with an assisted delivery were more likely to sustain a tear than women with a spontaneous vaginal delivery. Comparatively, women who had a caesarean section were less likely to sustain any degree of tear compared to women with a spontaneous vaginal delivery or assisted delivery. Age was also a predictor of perineal tears with women over the age of 30 years less likely to have a higher degree of tear compared to women aged 29 years and younger. Furthermore, results related to BMI and degree of tears found that women who are not underweight are less likely to have higher degree tears.

The volume and severity of perineal tears are increasing, which may be explained by the increasing number of assisted births, which the results show is associated with more severe perineal tears. Asian women 25 years old and younger and NZ European women 26 years and older are the most likely to experience an assisted birth, therefore it is plausible that this group are at higher risk of more severe perineal tears.

New Zealand Health Survey – Sexual and Reproductive Health Module 2023/24

During finalisation of this thesis, a journal article was published using this data (Weatherall et al., 2024). The researcher decided to display the analysis and research findings to answer the research questions and provide a wider context to the discussion.

The Sexual and Reproductive Health Module was a one-off additional module added to the New Zealand Health Survey in 2014/15. Adults who had completed the core survey were invited to participate in the additional module. The module was completed by 87% (10,198) of the participants who completed the core survey. The New Zealand Health Survey 2014/15 uses a stratified, probability-proportional sampling design where participants are selected from an area-based sample and a list-based electoral roll sample to increase the participation of Māori, Pacific, and Asian groups (Ministry of Health, 2015).

Demographics

Within the dataset, 5840 or 57.3% of cases were female, and 4358 or 42.7% were male. The male cases were not included in the analysis. Of the female cases, the age ranged from 16 to 74 years of age. The mean age of female cases was 43.7 years (SD = 15.7). For data analysis, prioritised ethnicity was used. Participants who chose more than one ethnicity were grouped into the ethnic group based on priority ethnicity in the following order: Māori, Pacific, Asian, European, no ethnicity (see Table 15).

Table 15

Frequencies and percentages of age and ethnicity

	n	%	95% CI
Age			
16 to 29	1352	23.2	22.1, 24.2
30 to 49	2265	38.8	37.6, 40.0

50 to 74	2223	38.1	36.8, 39.4
Total	5840	100	
<hr/>			
Ethnicity			
<hr/>			
Māori	1530	26.2	25.0, 27.4
Pacific Peoples	323	5.5	5.0, 6.1
Asian	429	7.3	6.7, 8.0
European	3555	60.9	59.7, 62.2
Total	5837	100	
<hr/>			
missing	3		
<hr/>			

Pregnancy. Female cases were asked whether they had ever been pregnant. However, the survey did not guide participants on what constituted a pregnancy (e.g. whether the pregnancy resulted in a birth, or how many weeks of gestation the pregnancy lasted). Of the sample, 74.4% (n = 4344) of women reported they had been pregnant and 15.9% (n = 931) had not, and 9.7% (n = 565) did not answer the question. Women were asked how many times they have been pregnant. The data was collapsed into four categories: once, twice, three times, four or more times.

Urinary incontinence. Women were asked two questions about urinary incontinence. The first question referred to the frequency that participants experienced urinary incontinence (during the last three months, how often have you lost control of your urine?), and the answering format ranged from 1 = never to 6 = more than once a day. The second question referred to the severity of their experienced urinary incontinence (when you lose urine, how much usually leaks?) and the answering format ranged from 1 = a few drops to 4 = enough to wet the floor.

The first variable (i.e. during the last three months, how often have you leaked urine or lost control of your urine?) was collapsed into a binary variable (those who have experienced some form of urinary incontinence in the last three months and those who have not). Participants who

answered 'never' to this question were coded as 0, and those who answered 'less than once a month to more than once a day' were combined into a category 'yes' and coded as 1. Of the dataset, 43.5% (n = 2472) of women reported experiencing some form of urinary incontinence in the last three months.

Of the participants who reported some form of urinary incontinence, 41.3% (n = 1022) reported a frequency of 'less than once of month', which reduced to 4.3% (n = 106) reporting urinary incontinence 'more than once daily'. For severity, of those who answered this question, 61.4% (n = 1505) reported 'a few drops at a time', 34.9% (n = 854) reported 'enough urine to wet underwear' and 3.7% (n = 91) reported they leaked enough urine to 'wet their outer clothing' and 'wet the floor'.

Table 16*Frequencies and proportions of pregnancy and urinary incontinence*

Ever been pregnant?	Count	%
Yes	4344	82.4
No	931	17.6
Total	5275	100
<i>missing</i>	529	

Number of pregnancies	Count	%
1	729	16.9
2	1183	27.5
3	1011	23.5
4 or more	1378	32
Total	4301	100
<i>missing</i>	1539	

Urinary incontinence	Count	%
Yes	2472	43.5
No	3213	56.5
Total	5685	100
<i>missing</i>	155	

Frequency of urinary incontinence	Count	%
Never	3213	55.5
Less than once a month	1022	18.0
At least once a month but less than once a week	538	9.5
At least once a week but less than once every day	538	9.5
Every day	268	4.7

More than once a day	106	1.9
Total	5685	100
<i>missing</i>	155	
<hr/>		
Severity of urinary incontinence	Count	%
A few drops	1505	61.4
Enough to wet your underwear	854	34.9
Enough to wet your outer clothing	68	2.8
Enough to wet the floor	23	0.9
Total	2450	100
<i>missing</i>	3390	
<hr/>		

Urinary incontinence, pregnancy, age, and ethnicity.

To investigate the relationships between urinary incontinence and the factors of pregnancy, age, and ethnicity, a series of binary logistic regressions were conducted. The outcome variable was whether women had experienced urinary incontinence in the past three months (yes or no).

Initially, a bivariate logistic regression assessed the effect of pregnancy, specifically whether a woman had ever been pregnant, as the predictor. In subsequent analyses, the predictors entered included the number of pregnancies, age, and ethnicity.

The results (see Table 17) indicate that women who had ever been pregnant were nearly three times as likely to experience urinary incontinence (odds ratio = 2.95) compared to women who had not been pregnant. In the second analysis, each additional pregnancy significantly increased the likelihood of urinary incontinence. For instance, women with two pregnancies had a 57% higher likelihood of urinary incontinence than those with only one, while those with three or more pregnancies were 73% and 75% more likely, respectively.

The third analysis examined age as a predictor and found that women aged 30 and older had more than twice the likelihood of experiencing urinary incontinence compared to those under 30, with women over 50 having almost three times the likelihood of urinary incontinence.

Finally, the analysis by ethnicity revealed that Pacific Peoples and Asian women had significantly lower odds of urinary incontinence (odds ratios = 0.66 and 0.34, respectively) compared to European women. Māori women did not differ significantly in their likelihood of urinary incontinence compared to European women.

Table 17

Univariate binary logistic regression results for predictors of urinary incontinence

Predictors	Proportion	Odds ratios	95% CI	p-value
Ever been pregnant?	88.3	2.95	2.5, 3.5	<.001
Number of pregnancies				
One	17			
Two	27.5	1.57	1.3, 1.9	<.001
Three	23.5	1.73	1.4, 2.1	<.001
Four or more	32	1.76	1.4, 2.1	<.001
Age				
16 to 29	23			
30 to 49	38.7	2.42	2.1, 2.8	<.001
50 to 74	38.3	2.99	2.6, 3.5	<.001
Ethnicity				
Māori	26	1.01	0.9, 1.2	0.22
Pacific Peoples	5.2	0.66	0.5, 0.9	<.001
Asian	7.2	0.34	0.3, 0.4	<.001
European	61.6			

Note. Table 17 When all four predictors are included together in a multiple binary logistic regression, each factor remains significantly associated with urinary incontinence, with the pattern of odds ratios consistent with those observed in the univariate analyses.

Figure 15

Percentage of UI by pregnancy status (pregnant vs. not pregnant)

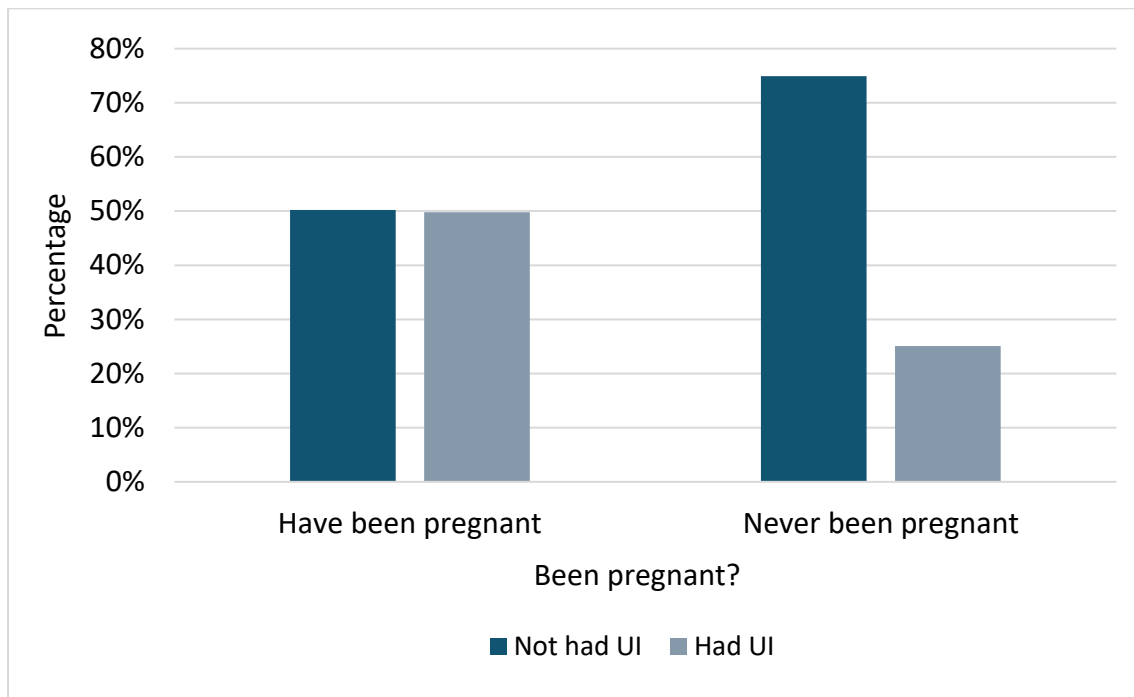


Figure 16

Percentage of UI by age category

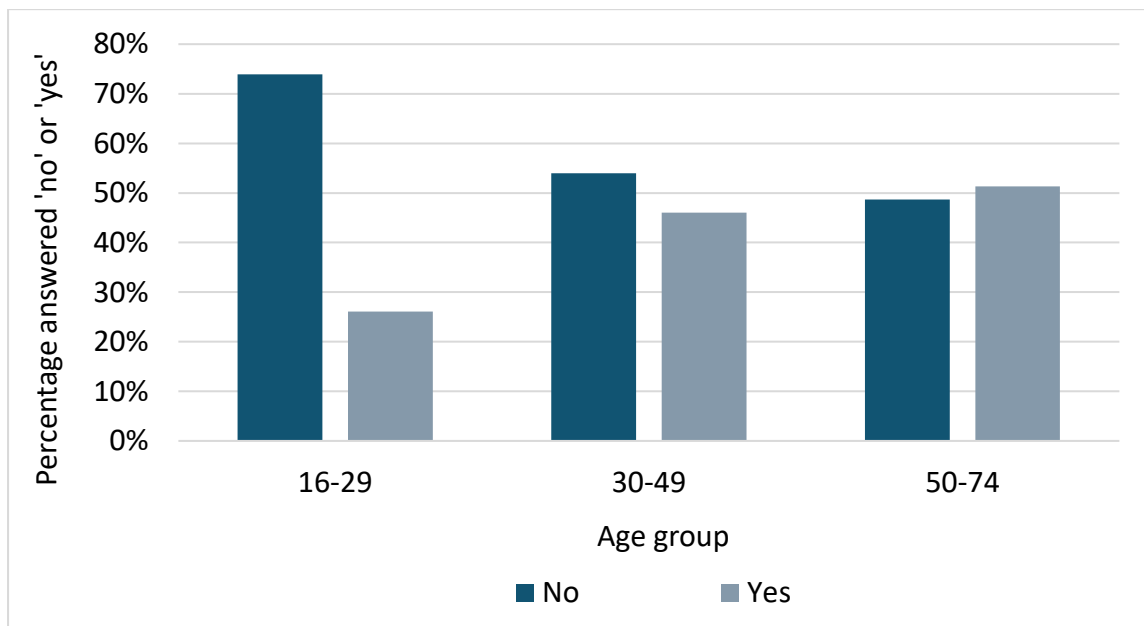
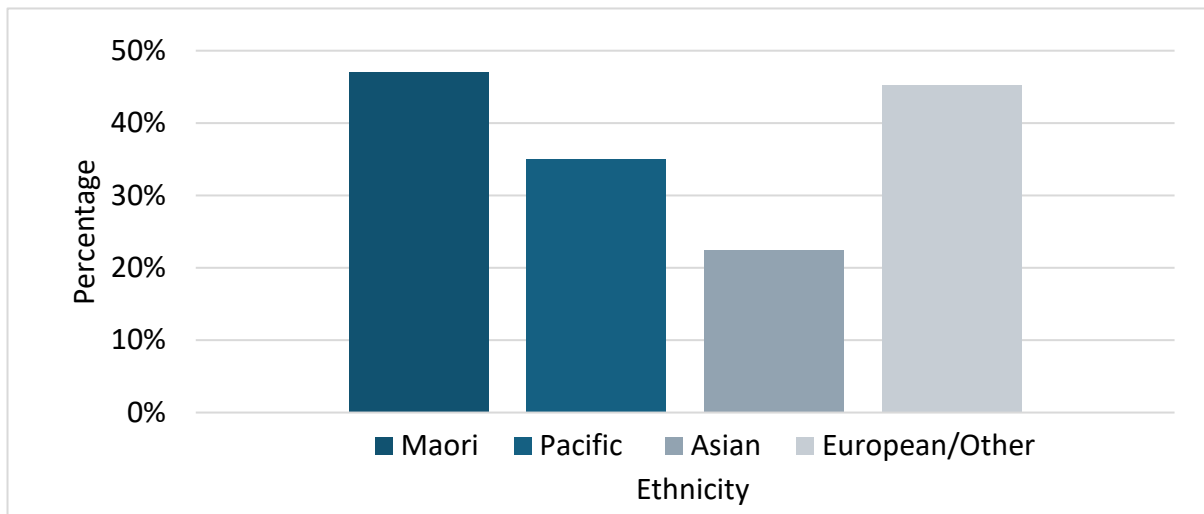


Figure 17*Percentage of UI by ethnicity*

Association between frequency and severity of urinary incontinence. An ordinal logistic regression was conducted to test the relationship between frequency and severity of urinary incontinence. The results showed a significant relationship ($p < .001$) with an odds ratio of 2.05; 96% CI [1.9, 2.2], indicating that for every one-unit increase in frequency (e.g. moving from *Once per day* to *More than once a day*), the odds of having a higher severity level of urinary incontinence increase by 2.05.

Summary of findings

In summary, of the sample, 43.5% of women reported some form of urinary incontinence in the last three months. Additionally, women with high frequency of urinary incontinence were most likely to have the greatest severity of urinary incontinence symptoms.

In addition, results showed that pregnancy is significantly associated with urinary incontinence. Women who have been pregnant are three times more likely than women who have not been pregnant to experience urinary incontinence.

Results found a significant association between age and urinary incontinence. Women aged 30 and over are twice as likely to experience urinary incontinence than those aged under 30 years. The prevalence of urinary incontinence continues to increase with age with women over the age of 50 years most likely to experience urinary incontinence. Ethnicity is also significantly associated with urinary incontinence. This dataset shows that Pacific women and Asian women are less likely to experience urinary incontinence compared to New Zealand European mothers.

Summary of quantitative findings

This quantitative analysis provides some valuable insight into the changing mode of delivery and perineal trauma over 17 years. A snapshot in the middle of this period (2014/15) provides useful information on the symptoms of urinary incontinence and its association with pregnancy.

These results have shown that women are having more intervention in their births, with increasing numbers of caesarean sections and assisted deliveries over time. The rates of perineal tears are also increasing in number and severity.

The prevalence of urinary incontinence in the female New Zealand population is high, with 43.5% of women experiencing some form of urinary incontinence. Women who have been pregnant are more likely to experience urinary incontinence and at a greater severity. Women's demographics such as age, ethnicity, and BMI are also associated with mode of delivery, perineal tears, and urinary incontinence. Further work is required to explore whether there is an association between mode of delivery, perineal tears, and urinary incontinence.

Chapter Six – Results (qualitative findings)

This chapter presents the findings from individual interviews with nine women within the postnatal period and four interviews with key informants with significant experience in this field of study. This chapter seeks to answer the following research question:

- What are the experiences of women with pelvic floor dysfunction within the postnatal period (one year after birth) in accessing information, diagnosis, and treatment for their symptoms?

The findings are presented with qualitative description and thematic analysis of the transcribed verbatim interviews. The analysis of the interviews with postnatal women is presented first, followed by the analysis of the key informant interviews.

Interviews with postnatal women

Nine postnatal women participated in individual semi-structured interviews. Table 18 shows the demographic details of these women. All women had spontaneous vaginal births. Reported pelvic floor dysfunction symptoms varied across the participant group from mild urinary incontinence during impact activity to severe pelvic organ prolapse.

Table 18

Participant demographic details

Months postpartum	Location	Parity
Mean – 8.5 months	Wellington region = 4	1 live birth = 4
	Auckland region = 3	2 live births = 4
	Canterbury = 1	3 live births = 1
	Nelson region = 1	

The following four themes were generated from the data: women have not been prepared for pelvic floor dysfunction; symptoms are dismissed; barriers to seeking help; and health professionals gave limited, delayed, unrealistic, or contradictory advice. Together these themes highlight the negative impact that pelvic floor dysfunction has on women's health and wellbeing in the postnatal period, which is exacerbated by their limited understanding of this dysfunction and treatment options in the postnatal period. Pelvic floor dysfunction is normalised or dismissed, which made women feel like they must cope with their symptoms and not seek help. Women who did seek help had multiple barriers to getting the treatment they needed, due to cost, availability of specialist health professionals, and personal barriers such as embarrassment. Women were often given inaccurate, unrealistic, and contradictory advice from health professionals, which also prevented them accessing the treatment they required.

Women have not been prepared for pelvic floor dysfunction

Most of the participants had not heard about pelvic floor dysfunction or its symptoms and were shocked at the extent of the disruption to their lives when they developed symptoms such as pelvic organ prolapse and/or urinary/faecal incontinence after the birth of their baby. These unanticipated disruptions included the inability to carry out the most ordinary of activities such as cleaning the house, and participating in sporting activities or exercise, which impacted their sense of wellbeing. The following participant, who experienced debilitating urinary incontinence, highlighted how significantly her everyday life was disrupted:

I didn't know that it would be so bad, particularly straight after birth, for those first couple of weeks, just like stepping 100 metres down the road and I'd leak through a pad. (p.1)

Those who had heard about some of the symptoms of pelvic floor dysfunction thought that they were problems that older women experienced, rather than younger women or after birth. The following participant, who developed a pelvic organ prolapse, spoke of her shock at this diagnosis:

I have never in my life heard about prolapse before... firstly she [obstetrician] said that the reason why prolapses are never really heard about in women my age is because it is normally seen as an old person thing. (p.6)

This lack of knowledge of pelvic floor dysfunction led women to feel that they did not understand what was going on with their bodies or what the longer-term implications were. The following participant drew attention to the uncertainty due to her unpredictable injury that now had an impact on her daily life, the disruption to activities that were previously considered routine, and no understanding of whether her symptoms would ever improve:

I've got this injury, don't really understand it. I don't know how long it's going to go on for and I don't know how much of an effect it's going to have on my day, like when you can't vacuum the house or you can't clean the house because of pain then what does the long-term look like... (p.8)

This lack of knowledge of pelvic floor dysfunction and not understanding what was happening with their bodies caused feelings of distress in women. The following participant spoke of the major disruption to her body image and her emotional wellbeing:

Probably should have seen a counsellor because initially I just felt ruined... I remember with my second visit to the physio, second or third visit to the physio, I was quite emotional about it because at that stage it's already started impacting quite significantly on my function. (p.3)

These feelings of distress were amplified in women who previously had an active lifestyle and did not have the knowledge of recovery timeframes and when they may be able to return to more physical activity. The following participant described the major impact on her mental health of being unable to engage in what was a routine habit of running:

...I think that was the like mind screw to begin with like going into a dark place because I was like, oh my gosh, I've got this injury. Am I ever – running is – keeps me mentally well. It keeps

me healthy. Am I ever going to be able to do this again. Yeah, so it was pretty dark to begin with. (p.8)

Women assumed that antenatal care would provide them with the information they needed after the birth of their baby, but this was not the case for symptoms of pelvic floor dysfunction. Participants were surprised in hindsight that the fundamental importance of the pelvic floor had not been given attention in the antenatal period:

I wish at antenatal class there was more focus on your pelvic floor. Actually, I wish at high school there was more focus on your pelvic floor as a – well not even females because males I've learned can experience it as well – the importance of your pelvic floor and it's not just doing a few Kegels [a type of exercise] here and there... and that but I think there needs to be more seriousness put on it because [of] the effects later on. (p.3)

Participants perceived that antenatal educators focused on looking after the baby, rather than the mother's recovery. The following participant would have preferred to be educated about the realities of the recovery from giving birth as well as information about looking after a newborn baby:

Before birth having more knowledge and even – like even some stuff around then like how the pelvic floor works... it's like having information before and then having access to information and resource after... Yeah. It's great you're having a baby, but we have to deal with the other – the impacts of that too. (p.4)

In addition to the perception of poor education from health providers and antenatal educators through the perinatal period, women struggled to find information about their symptoms. This lack of available information contributed to women's lack of knowledge of their symptoms, and caused barriers to knowing where to seek help. The following participant indicated that superficially pelvic floor dysfunction is talked about socially but in-depth resources were missing:

I don't know if there's a lot of information for women. It's talked about that it's really common but I don't think that there's a lot of information in general out there for women to understand what that might feel like and then what they can do about that. (p.7)

Due to the lack of pelvic floor dysfunction education, women had to seek information from other sources, mainly via the internet, social media, or friends and family. Some participants found it challenging to find reputable sources of information on the internet. The following participant appeared to have a level of health literacy that enabled her to search for reputable evidence-based information sources:

I looked at websites, I tend to go to like google Health New Zealand prolapse or stuff like that to try and understand more, try to make sure it's a New Zealand website and an accredited one not just some misinformation. Yeah and then watching some YouTube videos and – of surgeons and specialists explaining different aspects of it. (p.3)

Of note across the dataset, women found that in terms of initial information, their informal networks were more informative than their connections with professionals. Women found that talking to other mothers provided them with information and support. These connections were often made through postnatal mother and baby classes or antenatal groups:

It's surprising how much you find out just hanging out with other mums, right? So by the time that I was diagnosed, I've self-diagnosed because in conversation with other mums I was like, oh, but that's what I'm feeling. So I guess – I haven't done an awful lot of Googling because I feel like it makes it worse... its reassuring to something that is already helping a lot is just engaging with the Mums and Bubs Pilates group and that kind of thing... it's reassuring to talk to other mums that have the same issues. (p.5)

From the data, it was evident that women were willing to talk about what might be considered a taboo subject and raised issues of pelvic floor dysfunction in their social networks.

Alongside providing support, postnatal groups also provided information about where women could seek help for their symptoms or recommendations for good health professionals:

I feel like all the knowledge I got around it came from mainly having conversations at this mummy and baby exercise class, looking into a little bit myself... the woman who runs it – and I always recommend her to everyone, she’s really great. It was really good, and there are opportunities for – like in a group chat and things like that, so chatting with other mums and things. Then I had some discussions like around the pelvic floor but I guess it’s not one-on-one... So it was good – it was really helpful and definitely helped me on my journey and to kind of understand it and stuff. They helped me link to then this private physio. But yeah, nobody else really spoke about it, like it’s really bad. (p.4)

This theme highlights the often dramatic, unexpected, and prolonged physical, emotional, and functional changes participants underwent. Across the dataset, participants considered they were ill-prepared for these bodily changes, which led several to evocatively describe these changes as an injury and their body as ruined. The data indicated that women were open to discussing issues they were experiencing around pelvic floor dysfunction, and although these opportunities were available through their social networks they were not prepared and well resourced in the antenatal and immediate postnatal period. Women therefore typically felt uninformed, confused, and sometimes distressed.

Symptoms are normalised and dismissed

In addition to women feeling uninformed and unprepared for the changes in their bodies after birth, they were being told by friends, family, and health professionals that their symptoms were normal and just something that occurs after birth. This normalisation of pelvic floor dysfunction led to women feeling that they must cope with the symptoms and not seek help. This normalisation was often driven by other female friends and family who had also experienced pelvic floor

dysfunction. The following participant describes the advice she was receiving from close family members and the shock she felt by this dismissal of her symptoms:

Do you know what, this just happens after birth. Then I also had like my mother-in-law telling me that, you know, she's always been incontinent. That's just what happens when you have babies. Had so many people just say, yep, this is just a part of motherhood that nobody tells you about. I was like, what the hell? So, that was all the information that I was getting. (p.6)

Across the dataset, women were surprised to find that many of their fellow new mothers were experiencing pelvic floor dysfunction symptoms. As a result of this normalisation from family and friends, and the high prevalence of pelvic floor dysfunction symptoms within their social circles in the postnatal period, participants assumed these symptoms to be something every postnatal woman experiences and most suffer with:

I guess what does make talking about it harder is the fact that sometimes within a group of mums, you know that all of them have issues and so you – it's okay to talk about it, but at some stage you can also see that it's just a fact – a thing of, yeah, we're all struggling with these things and we're all just coping with it. So it's like, it's just part of the process, so just get on with it. (p.5)

This normalisation of pelvic floor dysfunction symptoms was exacerbated by midwives dismissing symptoms after birth. Participants indicated that midwives would associate symptoms with normal healing after vaginal birth, which made them feel that they should just cope with symptoms. The following participant explained how her midwife dismissed her symptoms without fully assessing her problem:

I told the midwife when she came around and she said, "it's probably because you've been sitting down a lot breastfeeding, it could be something to worry about, might not be, just see how it goes". (p.3)

Some participants had similar experiences with their GP when they raised their pelvic floor dysfunction symptoms, with them often suggesting that they are normal after giving birth. The following participant was surprised that the symptoms she was experiencing were considered to be normal:

GP was of a similar opinion. She was like, "you know what? I looked at your situation and it actually looks really normal. It just looks like a normal vagina and you're going to be absolutely fine. It's probably nothing more than just normal laxity post birth and it's still very early days"... But even when I was describing the symptoms to her, I guess she just said, "it's really normal".
(p.5)

Some participants perceived that as a result of normalisation of symptoms and possible treatment methods, health professionals delivered their advice in an unsympathetic manner. The following participant described her dismay at how her GP assessed and described her symptoms and possible treatment options with a lack of empathy and minimisation of what the surgery entailed:

Basically I laid down on the bed, I told her it was a problem, and she [GP] just looked at me oh yeah, cool, "so you've got a prolapse. So, it's just like – it's a really easy operation. They just go in, they cut a hole out, they stitch you back up, and you're good and you're fine. So, I'm assuming you've already figured out what gynaecologist you want to go to. Give me her name. I'll give you a referral. Here's a referral, go"... I was in such a state of shock. (p.6)

Some of the participants perceived that the normalisation of symptoms, lack of treatment options available to them, and the absence of empathy they experienced were due to gender bias or sexism in the health system. The following participant suggests there is a lack of understanding of the female anatomy and the differences to male bodies, which she perceived is a reason for dismissal of pelvic floor dysfunction symptoms:

It's probably the nature of our medical system still, isn't it – and it's same globally I think. You know it's that real-male dominated, male-body – you know just sort of more emphasis on

women's bodies, and women's bodies aren't the same as male bodies... Like you don't know – it's different – it is different – we have different make-up, we have different – and I don't know if there's the same recognition of it. (p.4)

Across the dataset, participants highlighted that care shifted from themselves to the baby after the birth of their baby. This led to women feeling that their symptoms were dismissed and less important after the birth. The following participant explains her experience of health professionals focusing solely on the health of her baby, and her shock when a health professional asked about her health and wellbeing:

I found post-birth everything revolves around the baby... the doctor was the first – the GP when I went and said I'm not coping, he was the first person that said, well, how are you? I'm not – I don't care how the baby is, how are you? But up until that point, everything had Plunket visits, everything had been about the baby... I feel like everything is on the baby and you're just kind of like this vessel that supports, there should be focus on the mum and particularly her pelvic floor. (p.3)

This shift in care from mother to baby often resulted in women not receiving any follow-up pelvic healthcare, which they felt they needed, especially those who experienced perineal trauma. Across the dataset, women reported that health professionals involved in their early postpartum care did not screen or assess for pelvic floor dysfunction. The following participant would have liked her midwife to have assessed her perineal tear before being discharged from her care:

I think part of the problem was that like my midwife kind of finished but and she never really checked... I don't think my midwife ever – so, she examined – so, I had a decent tear and then I had a massive hematoma and I think she examined me at a week, and no one's examined me since then... I thought that my tear had come apart because it just felt very weird. I was like, am I actually just bleeding from my tear and has that – because no one had ever actually checked it. (p.2)

Some participants expected that at six weeks postpartum they would receive a check from their GP, but were surprised that this was not the case, and the six-week GP check was just focused on the baby. The following participant thought that the six-week check would be an opportunity to assess the mother's recovery including her pelvic floor health:

Baby went in for her six-week immunisations and bits and pieces, they booked her in for a six-week GP check but didn't book anything in for me, or the doctor didn't ask anything about me or anything like that... I don't actually know if this is a thing, but how the baby gets the free GP appointments, if it was just one that was for the mum at six weeks or something. Even if it wasn't a pelvic floor physio, even if the GPs maybe were more educated on pelvic floor health to then have that free appointment and then discuss perhaps. (p.9)

This theme highlights the systemic normalisation of pelvic floor dysfunction symptoms of postpartum mothers from health professionals, friends, and family, even when women faced life-changing disruptions such as pelvic organ prolapse. The high prevalence of pelvic floor dysfunction symptoms in new mothers' social circles exacerbates this feeling that women must cope with the symptoms. The data indicated that participants wanted to discuss their issues with health professionals. However, due to the health professionals' focus shifting to their baby, their pelvic floor dysfunction symptoms were dismissed or not given time to be addressed. Postpartum women's health appeared to become invisible or minimised. The lack of empathy and knowledge of pelvic floor dysfunction by health professionals led some participants to feel that this was due to gender bias or sexism.

Barriers prevent women getting help

Women reported multiple structural and personal barriers to getting the care and treatment they needed for the pelvic floor dysfunction symptoms they were experiencing after birth. Across the dataset, participants were recommended by multiple sources to see pelvic health physiotherapists for specialised assessment and treatment. Many of the participants did seek out pelvic physiotherapists, but due to the lack of availability through the public system had to pay for private

treatment, which was a barrier to regular treatment. Women who did attempt to see a physiotherapist through the public system had a long wait for treatment. The following participant describes the long wait to see a pelvic physiotherapist, and upon being given an appointment found that she was allocated into a group class that did not suit her needs:

My first birth I paid privately for that [pelvic physiotherapy] and then my midwife referred me through the public system, but it took about eight months to get to see anybody... the first time around it took six or eight months to get a group physio class and from there I still had to wait a few weeks to get a private physio appointment through the hospital. (p.1)

Due to the long wait times in the public system, many of the participants self-referred to private pelvic physiotherapy but the cost of this was stressful, especially during maternity leave without normal salaries. The following participant explained her deliberation about whether she could afford to pay for private treatment:

It is also tricky as well because although there is the ACC funding there is still the part of charge you have to pay so quite often my appointments end up being \$80 per appointment... but we're fortunate that we're in this position where I can pay and get the help sooner than wait on the hospital list... so then it was like, what is a priority to me right now and is that that I utilise savings to pay for care now or do I wait? I didn't want to wait. (p.8)

The participants who could pay for their private physiotherapy felt guilty that they could pay for their treatment and improve their quality of life, whereas they acknowledged some women would not be in the position to seek help:

Then, also being able to be in a financial situation to be able to pay for a physio is a huge privilege but I guess it shouldn't be, it shouldn't be. It should just be there for everyone. There's so many women who just can't have that care and that's a real shame because the discomfort, experiencing that discomfort every day for the rest of your life would just be really horrible. I mean as it is, wearing a pessary is still annoying, but it allows me to feel more comfortable on a day-to-day basis. (p.7)

Some women were able to get financial help for pelvic physiotherapy through ACC. However, the ACC funding guidelines for birth injuries were not widely understood by health professionals, which often led to barriers to women getting physiotherapy treatment or devices that would help women manage symptoms. The following participant expressed her confusion about how ACC classified her injury and what she could claim treatment for:

I've gone through ACC because I had a tear, so I don't know if that's totally strictly legit with ACC criteria, but because I had the tear, I can see the physio with ACC subsidy and even though my prolapse is not – I don't know if prolapse is really included, but because I had the tear I can see through ACC and get my prolapse treated because I'm seeing the physio at the same time.
(p.1)

Some participants expressed the absence of pelvic physiotherapists in their local area, leading to long travel times, which is not regularly feasible in the busy postnatal period. Alongside the cost of this treatment, long travel times were a barrier to regular physiotherapy treatment. The following participant explains why she could not attend regular physiotherapy treatment due to the travel time:

I was supposed to go back next week which will be a month, but it was going to be two weeks but it's just like it was almost an hour for us to get there. (p.2)

The lack of coordination of care across different health providers led to confusion and time spent navigating the health system. Participants expressed time going back and forth to different appointments and repeating their experiences to multiple health providers. The following participant expressed her frustration with the absence of information continuity across health providers and having to repeat her experience of pelvic floor dysfunction:

It's very – it's all separate. So they [gynaecologist] got the referral, he then asked questions and had to say everything again. Then he looked up my notes from the hospital, he sent the notes back to the GP but the GP hasn't followed up. I guess I wouldn't expect them to. So I guess we'll just wait and see what happens with this next lot of tests and then go from there. (p.3)

Across the dataset women reported personal barriers, such as lack of time or feelings of embarrassment, preventing them from seeking help or doing activities, such as pelvic floor muscle exercises, they knew might improve their pelvic floor dysfunction symptoms. The following participant expressed her frustration that she knew the exercises might improve her symptoms, but finding time in the busy postnatal period was challenging to complete the exercises properly:

I got a handout from a physio, there was like – at the hospital, so, I had to stay the night and I got like a three-page handout which was actually really good. It had some back exercises and some tummy exercises I did the back exercises once because there just wasn't any time. You just – there's just not – it's so hard to do them even knowing that you should and yeah, just to find the time is just hard. (p.2)

Some participants expressed their embarrassment at their pelvic floor dysfunction symptoms and acknowledged that this prevented them from seeking care, or they found the experience of treatment for pelvic floor dysfunction with a health professional awkward and uncomfortable. The following participant explains that she felt embarrassed during treatment but persisted as she knew it would improve her symptoms:

I did find it hard to talk about. How do I put it? I feel I'm someone who's quite confident in my body and quite aware of my body – I did a lot of yoga in the past and I feel quite feminist in that I should be able to talk about my body and private parts, but I do find it awkward and embarrassing, but I just kind of push through that anyway, because I know that I need to. (p.1)

Participants expressed that due to pelvic floor dysfunction being considered a taboo topic, and the embarrassment they felt discussing their symptoms, women would prefer to talk to a health professional who they knew well. The following participant explained how she would not have raised an issue with a health professional she didn't know, but would have felt more comfortable talking about pelvic floor dysfunction with a health professional she trusted:

To be honest, I think the doctor that we saw, we hadn't actually seen before, it was just whoever we could get at the time, but I don't think I would've felt comfortable chatting with them. Unless they asked, I wouldn't have necessarily felt comfortable, I'd probably have gone back. (p.9)

This theme highlights the multiple barriers women have to overcome to seek support and treatment for pelvic floor dysfunction in the postnatal period. Women reported that treatment was not freely available from the public health system, which drove them to seek it from the private system, which caused financial pressures and rationing of treatment. Alongside the financial costs of private treatment, specialist care was not always available within close proximity, which restricted regular travel to appointments. Participants reported their experience of having to navigate the health system to seek appropriate treatment and regular repeating of their experience to health professionals, which caused annoyance and wasted time. Participants expressed embarrassment explaining and getting treatment for their symptoms, which in some cases prevented women seeking treatment.

Health professionals gave limited, delayed, unrealistic, or contradictory advice

Participants reported that health professionals (even those specialised in pelvic floor dysfunction) did not always have up-to-date information or were given differing diagnoses and prognoses, which caused confusion. Participants who sought help from their GP had mixed experiences and sometimes were given wrong advice. The following participant explains her multiple episodes with health professionals to get the treatment she needed:

Some of the reading I had done online had suggested using oestrogen cream. So I was like, hey, I read this online about oestrogen cream. GP – “You’ve got enough oestrogen. You don’t need to be using cream”. Which is fine. That’s not her expertise. GP is a generalised health not specialist... So I went back to the physio for that six week check. Physio – “We want you to be using oestrogen cream to try and provide some more support back into the tissue lining and stuff like that. Can you go back to your GP and ask her to prescribe it?” (p.8)

Participants built trusting relationships with their midwives throughout their perinatal journey and therefore felt most comfortable discussing what they perceived were embarrassing symptoms with them. However, participants were surprised that their midwife did not have the expertise to assess pelvic floor dysfunction or provide appropriate treatment. The following participant explains how her midwife acknowledged that treatment for pelvic floor dysfunction was beyond the scope of her practice:

We (midwife) talked about Kegels quite soon after birth, maybe a couple of weeks after birth and she's acknowledged that wasn't her area of expertise. (p.1)

Participants reported that they were often given different advice from health professionals, including pelvic floor dysfunction specialists, which led to confusion about treatment and prognosis. The following participant explains the varying opinions between pelvic physiotherapists about her diagnosis and prognosis:

Quite varying opinions about the severity and the recovery and the prognosis of the prolapse in that. So that was quite interesting. So, the first physiotherapist said that once the ligaments are stretched, they're stretched and they're not going to go back. The second physiotherapist was like, you know what, it's such early days, there's definitely lots of recovery that still needs to happen. Don't stress about it, you'll be absolutely fine. (p.5)

In addition to varying advice from health professionals, participants reported being given unrealistic advice, or advice which would considerably reduce their antenatal activity levels. The unrealistic advice was often not followed due to participants having to carry on with normal daily activities, especially when looking after older children and the new baby. The following participant explains how she could not adhere to the advice given to her by a health professional:

She had basically told me that I couldn't – I was not allowed to lift anything more than 10 kilograms. Basically for me, the physio is telling me that I'm not going to be able to lift anything. I was just like, that's not an option. I mean, my baby at that stage, she was well over 10 kilograms.

So, my physio had told me I can't lift my baby, I can't lift a basket of washing, I have to get my husband to lift suitcases for me, and I was like, are you insane. I can't function like this. She even told me that vacuuming was too much strain on my pelvic floor. So, I was like, yeah, this is not going to work. (p.6)

Participants expressed their dismay at the limited treatment options available for women with pelvic floor dysfunction and the likelihood that surgery may not fully resolve their symptoms. The following participant explains her experience of discussing surgical options with a gynaecologist and discovering that multiple surgeries may not resolve all of her symptoms:

I have got to have two surgeries... but interestingly he (gynaecologist) said that if we take the pelvic floor back up, I may experience more incontinence because it's kind of acting as a bit of a plug or the bulge is. (p.3)

The lack of treatment options for those with more severe symptoms requiring surgery was even more out of reach for women who wanted to extend their family, who were then put in the position of living with their debilitating symptoms while they had more children or changed their plans for a larger family and have the surgery. The following participant highlights how this dilemma forced her to change her family plans:

She said [gynaecologist], yes, we can fix it with an op and then she said to me, but I will only do the op once you have finished having all of your children and every single one of those children can put themselves into a car seat... I was like well, ok, I've only had kid number one and at that stage I wanted three children. Things have changed... you're basically telling me I must come back to you in nine years' time for you to help me? (p.6)

Across the dataset, participants valued their treatment with pelvic physiotherapists and found that their symptoms did improve with treatment. Participants found that they were often not doing pelvic floor muscle exercises that they had learned from online sources or other health professionals properly and valued the physiotherapist's assessment and education to ensure the

treatment achieved results. The following participant explains how she was not completing her pelvic floor exercises properly before an appointment with a pelvic physiotherapist:

Even doing a pelvic floor like pulling to my – using my belly button, like pulling to the wrong place instead of my back and just all those types of things I wasn't aware of. (p.3)

Participants found support in the specialist expertise of pelvic physiotherapists, which reduced some of the anxiety about their diagnosis. The following participant expresses her comfort in discussing her symptoms with a health professional with specialist expertise in pelvic floor dysfunction:

I must say I did feel – especially the physiotherapist because they specialise in this area, I felt like they really knew, they really understood, and they were really there to give you all the options and all of the information. (p.1)

Having specialist information about pelvic floor dysfunction allowed participants to understand what was happening with their bodies. The following participant found the information given to her about her pelvic floor dysfunction useful and gave her back control over her body:

The information she [physiotherapist] gave was great and she went into detail showing me the little pelvis [model] I suppose and the different parts and how they work and all that kind of thing which was cool. (p.9)

Some participants struggled with finding the right physiotherapist to meet their pelvic floor dysfunction needs. Pelvic physiotherapists had different levels of experience and scope of practice, such as inserting pessaries. This difference in competency was not always made clear to participants, which did cause some confusion and additional appointments with different pelvic physiotherapists. The following participant highlighted how her referral to a different physiotherapist was not explained well to her:

I started with a different physio to begin with and we were doing exercises and things like that, that was needed. But the symptoms – even though it's a mild prolapse, the symptoms that I was experiencing were still impacting me daily. So then the next step was to look at getting a pessary. So that physio doesn't do it so she referred me on to the senior physiotherapist so I've just been working with her now... I think it might be training related because of how I had to switch between physios. The first physio couldn't do it but the second one could. The second one is a senior so that's what kind of implies to me it's potentially training based. (p.8)

This theme highlights how participants had to navigate through various health professionals to get the correct advice and treatment. Despite the prevalence of pelvic floor dysfunction, the data indicated treatment and advice were seen as specialist practice. Participants expressed that they wanted to talk to trusted health professionals about the pelvic floor dysfunction symptoms, but they seldom had the expertise needed to provide appropriate treatment. Even amongst specialist health providers, participants experienced varying advice about diagnosis and treatment, which caused confusion. Support and treatment by pelvic physiotherapists with specialist pelvic floor dysfunction expertise were valued across the dataset, as this gave women hope and solutions that improved their symptoms.

Interviews with key informants

Four interviews were conducted with key informants, all with considerable expertise in this field. The purpose of these interviews was to gather expert knowledge, opinion, and provide the current context of the state of postnatal healthcare in New Zealand for women with pelvic floor dysfunction. Interviews were held with the following participants:

- Midwife with community, hospital, and academic experience (P1)
- Pelvic physiotherapist with public, private, and teaching experience (P2)
- Experienced GP with interest in women's health (P3)
- Women's postnatal support charity CEO (P4).

Five themes were generated from the interviews: pelvic floor dysfunction has been normalised leading to women suffering from symptoms alone, the importance of advocacy, education and resisting normalisation, primary and community healthcare is inequitable and inadequate, assessing and treating pelvic floor dysfunction has become a specialist issue, and guidance and training on pelvic floor dysfunction is needed for all health professionals involved in perinatal care.

Pelvic floor dysfunction has been normalised leading to women suffering from symptoms alone

Across the dataset, key informants acknowledged the high prevalence of pelvic floor dysfunction and how the impacts are significant and life-changing for many women. The following key informant explains how common pelvic floor dysfunction is in postnatal women and the impact it has on women's lives:

I think huge impacts, like just so prevalent and just massive impacts... the injuries are so diverse and the impacts are equally as diverse, right and it's anything from leaking a bit of wee when you're jumping on a trampoline or sneezing or what have you right through to faecal incontinence and not controlling the bowels at all and sexual dysfunction, relationships ending because of it and so on and everything in between. What we – what I see really clearly is that it's so common. (p.4)

Alongside the physical impacts of pelvic floor dysfunction, participants highlighted the wider social impact of pelvic floor dysfunction on women. The following key informant describes how pelvic floor dysfunction can cause social isolation in the postnatal period:

The social impact – so people don't go out because they're leaking. Or they don't leave the house until after they've had a bowel motion, they've got faecal incontinence. Or they don't play sport anymore because they wet their pants – it's all awful. (p.2)

Key informants explained how the symptoms of pelvic floor dysfunction and the impact it has on women's lives were exacerbated by the normalisation of pelvic floor dysfunction symptoms in society. This led women to not seek care or feel that they must suffer with their symptoms alone.

I think for so long it's just been, it's just that attitude of this is just part of it, it's just part of – it's just normal, it's just part of birth, it's just, suck it up, princess, kind of thing. I think also – and those attitudes come from everywhere, they come from media and the kind of jokes about leaking wee on the trampoline, they come from friends and family, your aunty or your sister or your mother or whatever. If you express discomfort or a physical symptom or leaking or pain or whatever and the distress associated with that then people just come back with those attitudes.
(p.4)

This theme highlights the high prevalence of pelvic floor dysfunction symptoms in postnatal women, but due to the normalisation of symptoms by society and some health professionals it has led to women not disclosing their symptoms and not accessing appropriate healthcare. Key informants acknowledged and described the significant, life-altering impact that pelvic floor dysfunction has on some women and their longer-term health.

The importance of advocacy, education, and resisted normalisation

The normalisation of symptoms leads to women not seeking help or support for their pelvic floor dysfunction, which in some cases means they are living with life-altering symptoms for decades. The following key informant, a health professional, describes how symptoms are only disclosed upon asking and many years after they have started:

I usually end up seeing them in their 50s, 60s where they're in for something else completely different and you happen to ask about it and they're like, "oh yeah, I've had this for 20, 30 years, since having my kids, and you're like, you don't have to put up with it"... it usually comes up in some other way [symptoms of pelvic floor dysfunction], so I don't know whether their original intention was to come in to talk about it and then it kind of gets slipped in. I have to say,

most women who come in intentionally to talk about it, tend to be older, so many years after having kids when the incontinence is getting a lot worse. You don't get many really in that first year afterwards. (p.3)

Key informants acknowledged that awareness of pelvic floor dysfunction needs to improve in wider society to raise the knowledge and remove the embarrassment some women feel when raising their symptoms with health professionals. The following participant discusses how part of their role is removing the taboo from pelvic floor dysfunction:

So actually, having the conversations and that's part of our job as well as saying vaginas, vaginas, vaginas. Just making it okay and sharing the stories. Just smashing some of the taboo really as well as the practical, actually resourcing the sector and making sure that resourcing that, for example, the pelvic floor physio sector to make sure that we've got enough people to actually do the work when people do need it. (p.4)

Raising awareness would also ensure women know what is happening with their bodies, but in addition, provide women with the resources to know where to access help and support. The following key informant highlights the knowledge gap between women, but also among health professionals, which creates barriers to accessing healthcare and support:

One is awareness; so in terms of the woman being aware that – of what can go wrong, and what the symptoms are. Then, if they do have a problem, being aware that they can actually get help, and then being able to access that. There's lots of reasons why they can't. So it's that lack of knowledge and awareness with women themselves, but also with health professionals. They didn't have a problem, they shouldn't have had long-term issues, but because of the lack of awareness they did things they perhaps shouldn't have early on, didn't rehab, and then everyone's at risk, I guess, after they've had a baby. (p.2)

One participant explained that some health professionals don't fully explain the possibility of pelvic floor dysfunction to pregnant women due to not wanting to scare women about childbirth:

So I think there are lots of situations where – and then it is a surprise for them, because like you said, it's not discussed openly sometimes during – basically fear of being not sort of putting fear into them that that could happen sort of thing... There would be – have some anxiety fear related to that, not in a sense of complete fear of childbirth, but just general anxieties we all have about what changes it may make to our body and how would they think. (p.1)

Key informants highlighted that health professionals did not adequately prepare women for the possibility of pelvic floor dysfunction, resulting in them not having informed discussions about their birth plans. The following key informant explains that appropriate health professionals such as pelvic physios, midwives and specialists need to inform women about their risk factors for pelvic floor dysfunction before birth, and fully inform them about birth options, which may mitigate some of the risks before they give birth:

They're more likely to need forceps to get the baby out [identified at-risk women] because it becomes an emergency because it's been going on for so long. Forceps is a huge risk factor – and some countries don't use forceps anymore... much greater likelihood of trauma to the muscles if they have forceps. But maybe those people that have been identified in their pregnancy as being at risk – perhaps after an hour, they might not have gone – they might have decided to have a caesarean at that point. (p.2)

Women's awareness of their pelvic floor dysfunction is just as important for a subsequent birth to ensure women are informed during discussions about their birth plan. The following key informant explains how health professionals should be having an open conversation about symptoms of pelvic floor dysfunction and how that might impact the decisions for a subsequent birth:

So somebody who's had a prolapse, it's taken them a year to get back to where they were [usual activity levels] I would want to have a conversation, in a subsequent pregnancy, with the consent from the woman and whanau, saying look, let's talk about this – do you need to have further conversations regarding the mode of birth this time or not... But to me it's always that openness of, "hey, look this has happened, hopefully nothing will happen this time, but would you like to have a conversation?" I find that obstetricians/gynaecologists are very keen to have that conversation, so that the person has all the information that they need to make the decision of their birth, the second or the third time, or whatever round about it. (p.1)

Women's reluctance to talk to the health professional involved in their birth can be an additional barrier to gaining awareness of pelvic floor dysfunction. The following key informant highlights that one barrier to women openly discussing their pelvic floor dysfunction symptoms after birth, or prior to a subsequent birth, is that the trauma of birth has been associated with the health professional at the birth.

The other side of it is if there's any kind of psychological trauma associated with that midwife or obstetrician – bearing in mind psychological trauma happens for one in three birthing people. So, one in three mums would report their birth is traumatic, if there's any of that going on, then mum is very reluctant often to say to the midwife or the obstetrician or whoever who they feel has caused that trauma, they're not even going to want them to touch them. They're not going to want to share details. That reluctance to share details and reluctance to get care and mistrust of medical professionals can extend, as a result of birth trauma, can extend way past postnatal care. (p.4)

This theme highlights the role health professionals involved in postnatal care have, as they must advocate and resist normalisation of symptoms of pelvic floor dysfunction to ensure women get the treatment they need. Some key informants explained that poor preparation of women before

childbirth was not providing them with informed consent about their birthing options, which may have mitigated some of the risks of pelvic floor dysfunction.

Primary and community healthcare is inequitable and inadequate

Access to treatment for pelvic floor dysfunction through the public health system is challenging, often resulting in long wait times for treatment. There is no funded appointment for women with their primary care provider after the birth of their baby, which often means they don't disclose their pelvic floor dysfunction or know who to talk to. The following key informant explains how a funded GP check for the women is needed after birth to assess the woman's physical and mental health and screen for pelvic floor dysfunction amongst other conditions:

We don't really have anything to do with them [pregnant and postnatal women], certainly not related to pregnancy until they bring the baby in for a six week check, and that's usually at the time of immunisation and that check's funded for the baby, but there's nothing for the woman which I've often found is a big gap because really, there's lots of things we should be talking to women about after they've given birth, but it would be lovely if there was a specific female check as well post-delivery to get them re-engaged back with primary care, and it could become part of the standard questioning [for pelvic floor dysfunction], but at the moment it's not... mums miss out. A joint check would be amazing. (p.3)

Women who are referred to physiotherapy through the public system for postnatal pelvic floor dysfunction often have extremely long wait times to get an appointment. The following key informant explains how women often sit for long periods on wait lists, and some who can afford it don't realise they can access pelvic physiotherapy privately.

So some of them could have afforded to pay, but they didn't know, so they've sat on a waiting list for 18 months or 24 months. Didn't know that they could have just gone privately and paid for it. Or they couldn't afford it and they had to wait. Well, some of them have said that they got referred after their first baby and they've had another baby since then. So that's a barrier.

There's the lack of funded treatment. So there's a lot of people who need to access care through the public health system, because they can't afford it, and they can't get seen, because there isn't enough money. (p.2)

Since 2022, ACC partially fund pelvic physiotherapy for eligible postnatal women, but the cost is still a barrier to some women and many still don't know about the funding support. The following key informant explains how they were hoping ACC would fully fund appointments to remove the cost barrier to many women:

We were really pushing for full funding for every woman who has a baby, every person who has a baby. But of course that didn't happen, so there is still a surcharge – so that's still a big barrier for a lot of people to come in. Lack of excess to funding... Some people can't – well a lot of people can't afford it. It's still not free – there's big waiting lists in the hospitals. Maybe there's – I suspect there's cultural groups that aren't actually seeking care and maybe that's a socioeconomic sort of finance thing, or I suspect it would be. (p.4)

In addition to appointment costs, devices such as pessaries for pelvic organ prolapse attract an additional charge, which the following key informant explains can be prohibitive for some women:

I think last time we tried buying them [pessaries] in the clinic, they were something like \$70 or \$80. Of course, you usually need a couple of sizes because you put one in and then if the woman goes away and it's too small or too big, then they come back and you change it to one that fits appropriately, because it's not completely 100 per cent accurate when you measure, it depends when you put it in how it sits. They're expensive things that women can't afford to buy; you can't suddenly afford to pay \$160 for a couple of them until you find what size fits right. (p.3)

This theme highlights the limited provision of primary and community health services for women with pelvic floor dysfunction in the postnatal period. There is no funded postnatal medical check in primary care, which limits the opportunity for screening for pelvic floor dysfunction. Pelvic

physiotherapy through the public system is very limited with long wait lists, and private physiotherapy attracts a co-payment, which is inhibitive for some women

Assessing and treating pelvic floor dysfunction has become a specialist issue

In addition to the cost of treatment, the availability of appropriate health professionals trained in pelvic floor dysfunction assessment and treatment is a barrier to women receiving appropriate treatment and support. The following key informant describes that following the birth injuries funding from ACC there is a shortage of trained health professionals to support women with the treatment they need:

One of the biggest challenges with the birth injuries scheme is that there's just not enough pelvic floor physios, there's just not enough, gynaecologists, there's just not enough people to do the scanning even to get appropriate diagnoses of birth injuries. As well as that the psychological side, there's not enough counsellors and to support the whole person. Certainly from our perspective there's not enough birth trauma or birth injury informed counsellors and psychologists because that's a very specific kind of injury, whether it's physical or psychological and it requires specific certain kind of support. (p.4)

This lack of appropriate health professionals is exacerbated by pelvic floor dysfunction and women's health more generally being seen as a specialist health issue. However, this view that an endemic issue is a specialist's rather than a generalist's problem, which should be core business, is likely to impact the training of primary and community health professionals who are often the first port of call for most women with pelvic floor dysfunction. The following key informant explains how the specialism of women's health may be due to the involvement of procedures that require training:

I think probably it is becoming a specialism, but partly because it involves procedures. The reason I do more of it is because I'm trained to insert LARCs [Long Acting Reversible Contraceptives] and do the pessaries. In order to do those things, you need training to do it and not everyone's trained to do it. I think that's where it starts becoming specialised. (p.3)

The health professionals working within the public health system are often time-poor, which impacts the quality of healthcare and the coordination with other health providers involved in pelvic floor dysfunction care. The following key informant reflects on how limited time can make interactions with women and their babies very rigid:

The impression that I get is that their workforce is so stretched and so – yeah, just so stretched they just, it's – a lot of the interactions with midwives are very practical. They're very, okay, we're going to measure baby's weight and we're going to check your scar and we're going to do this, that and the other and there's not much relational stuff going on post birth or even pre-birth to be fair. (p.1)

The lack of time also impacts the relationships between different health providers involved in women's pelvic floor dysfunction care, which inhibits multidisciplinary working. The following key informant explains how GPs don't have time to connect with all providers based in the community individually:

It's difficult, because I think there are a million providers in the community that the GP needs to be connected with, and there's just not enough time in the day to connect with everyone. GPs don't have time to go and reach out, and then the private providers will often be reaching into clinics saying, can we come and talk to you and you're like, well there's no time you can come and talk to us. It's even just an awareness that they're there and who they are. (p.3)

This theme highlights the sporadic and insufficient approach to treating a very common women's health condition. There is a lack of health professionals trained to treat and support women with pelvic floor dysfunction, which exacerbates the access issues to appropriate care. This paucity of appropriate health professionals is worsened by women's health being seen as a specialist health issue for which additional training is required. Health providers involved in women's postnatal care are time-stretched, which reduces multidisciplinary working and co-ordinated care.

Guidance and training on pelvic floor dysfunction is needed for all health professionals involved in perinatal healthcare

Key informants report that many health professionals involved in postnatal care are not competent at assessing or treating pelvic floor dysfunction. Participants agreed that screening for pelvic floor dysfunction in the early postnatal period would be beneficial, but midwives and GPs are not all comfortable doing this, and there is no funded check/guidance of screening questions. The following key informant highlights that there needs to be better screening for pelvic floor dysfunction before and after birth to allow for changes in birth plans and assessment of it after the birth. However, this requires health professionals who have been trained in risk factors and symptoms of pelvic floor dysfunction:

So there needs to be more management of people who are more at risk – so there needs to be a screening and identification of people who are at risk. So we know what the risk factors are for pelvic floor trauma, pelvic floor just from childbirth. People who are screened in pregnancy and might fit into that category should be referred to be checked, and then maybe there could be some changes made around the birth. So that might be that they choose to go to caesarean... in the moment, it's not the time to make the decision I want to switch caesarean now. (p.2)

Midwives are often the main health professionals caring for women in the early postpartum period. However, the following key informant expressed that not all midwives will feel confident screening and assessing for pelvic floor dysfunction:

I think it would be variable, depending on who the midwife is [asking and assessing pelvic floor dysfunction]. Again, I think that there is no real guidance in a sense of what are the questions you should ask, and what support and information should you provide. (p.1)

GPs also require guidance on what screening questions to ask. The following key informant explains that screening for pelvic floor dysfunction should form the usual questions asked of postnatal mothers:

I think it's – if more training's needed, it's how to ask the questions, or not even how to, remember to ask the questions because if you don't ask you often don't know and it's how lots of us got trained years and years ago, to ask if someone with mental health difficulties is feeling like hurting themselves. It just has to be built in as part of your routine questioning so then it's just communication skills of how do you ask it to try and get the correct answer. Then responding appropriately, not normalising it. (p.3)

Key informants called for better training and guidance for health professionals, specifically midwives and GPs able to better understand pelvic floor dysfunction in postnatal women to move their practice away from a specialist issue to one that generalist health practitioners can assess and offer guidance. The following participant was calling for a guidance book on pelvic floor dysfunction for all women and health professionals involved in postnatal care to promote education, assessment, appropriate referral, and treatment:

So the idea was that every single person who's pregnant will get it [guidance book], and so that all the midwives and GPs would be the best people to actually have it, plus anyone else. So it can be available to, you know, so all the pelvic health physios as well, so that somebody will be able to get this information out... So that everybody is made aware of the pelvic floor muscles. How to do the exercises. Why. What sorts of things can go wrong. What they can do themselves to help. So for people who are continent and who don't have symptoms, then they should be able to learn from that how to make sure that they prevent it and learn how to do pelvic floor exercises. So that's fine. People who are incontinent or who don't think they can do the exercises themselves, because they're not aware of it, or perhaps their muscles are tight, then they should be referred. (p.2)

The following key informant also highlighted that there needs to be better pelvic floor dysfunction training for fitness professionals who work with women. This is especially in the high-risk

times such as postnatally and during menopause, as some exercise can exacerbate pelvic floor dysfunction symptoms:

So I guess you know postnatally, being aware of exercise options and what sort of exercise is appropriate. So maybe – I think there are some really good personal trainers and some good groups, like She Moves, and Move it Mama, and online postnatal groups... probably needs to be more knowledge amongst fitness trainers of this, because there are – and there's lots of menopausal women, or peri-menopausal women who are putting on a bit of weight and feeling a bit not very good about themselves, so they join a gym and get a personal trainer. But some young 23 year-old guy, they're going to tell him that they wet their pants. So there needs to be a lot more awareness for those people. (p.2)

Alongside better awareness and training for screening of pelvic floor dysfunction, the following key informant explained that there needs to be training for procedures associated with pelvic floor dysfunction (e.g. fitting pessaries to widen the access to treatment for women):

More education and training for GPs around pessaries and the ability to be able to source them quickly rather than waiting months, I think would be useful. (p.2)

This theme has highlighted that not all health professionals who care for women in the postnatal period are informed about pelvic floor dysfunction or are adequately trained to access and provide guidance for women with symptoms. This lack of information means that risk assessments are not always made before birth, and that screening for pelvic floor dysfunction does not occur in the early postnatal period. Outside of the health system, fitness trainers need better awareness of pelvic floor dysfunction to ensure that exercise is beneficial and not damaging. Health professionals such as GPs need better training in pelvic floor dysfunction procedures, such as fitting pessaries to improve access to pelvic floor dysfunction treatment for postnatal women.

Summary

This chapter can conclude that women with symptoms of pelvic floor dysfunction have a very poor experience of accessing information, diagnosis, and treatment of their symptoms. In addition to women's poor experience, participants were shocked at the prevalence of pelvic floor dysfunction symptoms in their postnatal cohort groups. Participants expressed how society normalised their symptoms, which was exacerbated by health professionals normalising and dismissing them. For women who did seek help, participants explained the many barriers to accessing treatment such as cost, availability of health professionals adequately trained to help them, and societal factors such as embarrassment. In many cases when women sought care, participants expressed their dismay that advice was inaccurate or contradictory to other advice they had received.

The themes expressed from interviews with postnatal women were built upon and confirmed by interviews with key informants. Key informants also highlighted the high prevalence of pelvic floor dysfunction in postnatal women and expressed their frustration at the normalisation of symptoms from society and other health professionals. Key informants described how some of the normalisation and dismissing behaviour is due to the lack of guidance and training of health professionals. Key informants expressed that due to limited knowledge, pelvic floor dysfunction is becoming a specialist health issue, even though symptoms are highly prevalent in postnatal women. In addition to poor awareness of pelvic floor dysfunction by primary and community health professionals, other barriers exist in women accessing care for pelvic floor dysfunction through primary and community healthcare. These barriers include long wait times through the public system for physiotherapy and the high costs of accessing physiotherapy privately. Key informants described how these barriers are exacerbated by no clear guidelines for health professionals and a limited workforce trained in pelvic floor dysfunction, such as GPs who should be able to treat some of the symptoms.

Both sets of interviews have highlighted that the health system is failing women with pelvic floor dysfunction, leading them to suffer in silence, significantly reducing their quality of life and possibly impacting their long-term health.

Chapter Seven – Discussion

The purpose of this research is to answer the research questions: 1) how is the mode of delivery (childbirth) and associated pelvic floor trauma (perineal tears) changing in New Zealand; and 2) what are the experiences of women with pelvic floor dysfunction within the postnatal period (one year after birth) in accessing information, diagnosis, and treatment for their symptoms? First, the study aims to quantitatively understand the changing mode of delivery practice in New Zealand, the trauma sustained to the pelvic floor through perineal tears, quantify the prevalence of known urinary incontinence, and estimate how these changes may impact the likelihood of overall pelvic floor dysfunction prevalence. Subsequently, the second aim of this study is to explore women's experience with pelvic floor dysfunction symptoms within the postnatal period, including how they access information, diagnosis, and treatment for their symptoms.

To begin addressing these questions, two literature reviews were undertaken to summarise the existing knowledge of the prevalence of pelvic floor dysfunction in postnatal women and to investigate women's barriers and challenges to accessing treatment or advice for their pelvic floor dysfunction symptoms during the postnatal period (Chapters Two and Three). A convergent mixed method design was undertaken to answer the research questions, which consisted of a retrospective descriptive study followed by individual interviews (Chapter Four). Findings from both phases of the study aimed to answer the research questions were displayed sequentially (Chapters Five and Six).

This chapter integrates the findings from both phases of the study and critically evaluates these in relation to the research questions and relevant literature. The main findings are discussed in detail: changing mode of delivery; changes in perineal tears; high prevalence of urinary incontinence and relation to pregnancy; and barriers to accessing pelvic floor dysfunction diagnosis and treatment for pelvic floor dysfunction in the postnatal period. Following a discussion of the findings,

recommendations are outlined. The strengths and limitations of the study are stated and followed by recommendations for further research.

Summary of key findings

The main findings from the quantitative phase of this research study are that between 2003 and 2019 the mode of delivery in New Zealand changed, with reducing spontaneous vaginal births and increasing assisted deliveries and caesarean section deliveries. In addition to this changing mode of delivery, perineal tears are increasing in prevalence and severity. The present study confirmed a relationship between assisted birth and perineal tears and international literature has linked assisted deliveries and perineal tears with the increasing prevalence of pelvic floor dysfunction. Therefore, it is likely that an increase in assisted deliveries and a higher proportion of women sustaining perineal tears is increasing the prevalence of pelvic floor dysfunction in New Zealand. This implication of increasing pelvic floor dysfunction in New Zealand women is pertinent as the study also found a high prevalence of 43.5% of them already experiencing urinary incontinence in 2014/15. In addition to the likely increasing trend of pelvic floor dysfunction prevalence due to changing modes of delivery and increasing perineal tears, the New Zealand population is also aging, which, considering higher prevalence of pelvic floor dysfunction in older age groups, would exacerbate this trajectory (Nygaard et al., 2008).

In light of these findings, it is important to understand women's experience of pelvic floor dysfunction, especially during the postnatal period when the first symptoms are likely to occur. The qualitative findings uncovered that the health professionals involved in perinatal healthcare have underprepared women for the likelihood of experiencing pelvic floor dysfunction symptoms in the postnatal period. Women often had no prior knowledge of pelvic floor dysfunction, and due to a lack of information resources available turned to family and friends who normalised their symptoms, leaving them to feel they must deal with their symptoms alone. Compounding the notion that pelvic floor dysfunction symptoms are normal, practitioners treat pelvic floor dysfunction as a specialist

issue, disregarding that symptoms are endemic in the female population. This ringfencing of knowledge created further barriers for women accessing appropriate information from their primary healthcare providers or their midwives who had been providing them care through their perinatal journey. In addition to information barriers, accessing appropriate evidence-based care such as pelvic physiotherapy was challenging due to extended wait times of (in some cases) over a year through the public health system or cost and availability barriers in the private system.

Mode of delivery

The current study findings show that between 2003 and 2019 there has been a changing trend in the mode of delivery in New Zealand. The findings show that for women, overall, more are having caesarean section deliveries and assisted deliveries and fewer are having spontaneous vaginal births. This trend is also witnessed in other OECD countries, such as England and Australia. England reports a decrease in spontaneous vaginal deliveries from 66% of births in 2011/12 to 47% of births in 2021/22. Caesarean section deliveries increased over the same time period from 12% to 20% of total births (NHS England, 2022). This trend is comparable to Australia where spontaneous vaginal deliveries reduced from 56% to 50% and caesarean sections increased from 32% to 38% between 2011 and 2021. Unlike the New Zealand findings, assisted deliveries remained stable during the period (Australian Institute of Health and Welfare, 2024).

The study has found changes in mode of delivery patterns between age groups and ethnicities. The study findings show that younger women (under 25 years of age) are more likely to have a spontaneous vaginal delivery than older women and that women between the ages of 26 and 30 are most likely to have an assisted vaginal delivery. The trend of younger women most likely to have spontaneous deliveries was also found in Australia, with women under 20 years the most likely age group to have a spontaneous vaginal birth (Australian Institute of Health and Welfare, 2024).

When studying ethnicity differences, the findings show that Māori women are more likely to have a spontaneous vaginal delivery than a caesarean section compared to NZ European women.

When considering both age and ethnicity, results showed that Māori, Pacific Peoples, and Asian women aged 26 years and older all had less likelihood of having an assisted birth, compared to NZ European women of the same age group, unless the Asian women are 25 years and younger. Then Asian women are seemingly having more assisted births compared to younger NZ European women. There is limited international evidence comparing indigenous populations and European women's mode of delivery, but studies in the USA have found differences between ethnic groups. Studies have found that African American and Asian women had higher rates of caesarean sections than white American women (Cagan et al., 2021; Getahun et al., 2009). In addition, Getahun et al. (2009) found that Hispanic women had the lowest rates of caesarean section.

The current study found that a women's BMI affects her mode of delivery, with underweight mothers the most likely group to have an assisted delivery. Healthy weight mothers were the most likely to have a spontaneous delivery and obese mothers most likely to have a caesarean delivery. The association between increasing BMI and caesarean section has been supported by the international literature (Angeliki et al., 2018; Kominiarek et al., 2010). This association is important due to the rising proportion of overweight and obese women in New Zealand. The New Zealand Health Survey 2022/23 reported that 61.2% of women surveyed were overweight or obese, and this proportion has descriptively been steadily increasing over the past 10 years (MOH, 2023).

Mode of delivery and pelvic floor dysfunction

The study findings report a change in the mode of delivery, which is an important finding in relation to pelvic floor dysfunction prevalence. Other studies have demonstrated that mode of delivery is associated with pelvic floor dysfunction symptoms (Blomquist et al., 2018, 2020; Handa et al., 2011). Barca et al. (2021) undertook a systematic review and meta-analysis to analyse pelvic floor morbidity following vaginal delivery and caesarean section delivery. The study reported that there were significantly higher rates of urinary incontinence, faecal incontinence, and pelvic organ prolapse in the vaginal delivery groups compared to women who had caesarean section deliveries (Barca et

al., 2021). Instrumental/assisted deliveries were not separated in this meta-analysis, which may have increased the likelihood of pelvic floor dysfunction within the vaginal delivery group, as instrumental/assisted delivery has been shown to hold an increased risk of pelvic floor dysfunction symptoms than spontaneous vaginal delivery (Blomquist et al., 2018; Handa et al., 2011).

These results are similar to Handa et al. (2011) who also reported increased odds of urinary incontinence and pelvic organ prolapse in women with spontaneous vaginal deliveries compared to women who had a caesarean section without labour. In addition, the study found the risk of pelvic floor dysfunction was even larger for women who had an assisted vaginal delivery. This increased risk of pelvic floor dysfunction through assisted vaginal delivery is confirmed by Blomquist et al. (2018) who found a significantly increased risk of faecal incontinence and pelvic organ prolapse in women who had an assisted/instrumental delivery.

It is likely that pelvic floor dysfunction symptoms in parous New Zealand women is changing due to the changing mode of delivery, and that it is likely to continue to change if the trend in mode of delivery continues. Based on the association between mode of delivery and pelvic floor dysfunction symptoms, it is likely that in New Zealand the reduction in spontaneous deliveries could be reducing the prevalence of pelvic floor dysfunction symptoms, however, the increase in assisted deliveries may offset this reduction.

The prevalence of pelvic floor dysfunction symptoms within the New Zealand female parous population may vary depending on age and ethnicity, due to variation in mode of delivery. The current study findings show that younger women (under 25 years of age) are more likely to have a spontaneous vaginal delivery than older women and that women between the ages of 26 and 30 are most likely to have an assisted vaginal delivery. Although not explored in this study, due to the strong association between spontaneous vaginal delivery and pelvic floor dysfunction, it could be suggested that these younger age groups are more likely to have pelvic floor dysfunction symptoms than the older age groups (31-34 and 35+) who had a higher proportion of women having a caesarean section

delivery. Due to this increased risk of pelvic floor dysfunction symptoms in women who have a spontaneous vaginal delivery, it is likely that Māori parous women have a higher prevalence of pelvic floor dysfunction compared to NZ European women due to their higher rates of spontaneous vaginal delivery.

When considering both age and ethnicity, results showed that NZ European women aged 26 years and older, as well as Asian women aged 25 years and younger, were more likely to experience assisted delivery births. Considering women who have an assisted delivery are most likely to experience pelvic floor dysfunction symptoms, the results suggest that these groups may be at highest risk for pelvic floor dysfunction symptoms (Borges et al., 2022; Everist et al., 2020; Fritel et al., 2020; Snyder et al., 2022).

In addition to age and ethnicity, the current study results show that mode of delivery is also associated with perineal tears. The findings show that women who had a caesarean section birth were more likely to have no tear than have any degree of tear, while mothers who had a spontaneous birth mostly had first and second degree tears, and women who had an assisted birth were more likely to have had a third or fourth degree tear. This could suggest that demographic groups more likely to have spontaneous delivery such as Māori and Pacific women (regardless of age), and groups more likely to have assisted deliveries, such as NZ European (26 years and older) and Asian women (aged 25 and younger) are most at risk of perineal tears.

Change in perineal tear trauma

Despite the overall reduction in spontaneous vaginal deliveries, and a small increase in the proportion of assisted deliveries, the findings show a significant increase in the proportion of women sustaining a perineal tear. In addition to an overall rise in perineal tears, the findings show that the severity of tears is also increasing. This study found that between 2003 and 2019 the proportion of women sustaining a perineal tear rose from 25.3% to 30.2%, with grade two and three perineal tears increasing. This increase in both volume and severity of tears is important in relation to pelvic floor

dysfunction, with studies reporting an association between perineal tears and pelvic floor dysfunction symptoms (Dasikan et al., 2020; Huber et al., 2021; Sigurdardottir et al., 2021)

The association between perineal tears and pelvic floor dysfunction symptoms has been shown to exist a year after childbirth. Huber et al. (2021) investigated pelvic floor dysfunction symptoms one year after a women's first childbirth in relation to perineal tear severity. The study found that women who sustained perineal tears were more likely to experience pelvic floor dysfunction compared to women who had not sustained a tear. The severity of the tear was also associated with the severity of pelvic floor dysfunction symptoms, with women sustaining more severe grade three and four perineal tears at the highest risk for urinary incontinence and pelvic organ prolapse, which impacted their daily life (Huber et al., 2021). This finding was supported recently by a study by Satore et al. (2024) who found that severe perineal tears (grade three and four) were predictors of stress and urge urinary incontinence throughout the first year after birth.

The relationship between perineal tears and urinary incontinence has implications for the prevalence of urinary incontinence in New Zealand. If the trend of increasing perineal tears with increased severity continues, it may indicate an increasing prevalence of urinary incontinence and other pelvic floor dysfunction symptoms in New Zealand women. This is pertinent as the findings of this current study found a high prevalence of urinary incontinence in the New Zealand female population in 2014/15.

Prevalence of urinary incontinence

The findings from the New Zealand Health Survey 2014/15 dataset show that of the female population surveyed, 43.5% expressed they had experienced some form of urinary incontinence in the previous three months. This reported prevalence of urinary incontinence is similar to other developed countries. A study of American women between 2005 and 2018 found an equally high prevalence of urinary incontinence symptoms with the prevalence of stress, urgency, and mixed urinary incontinence affecting 45.9%, 31.1% and 18.1% of women, respectively (Abufaraj et al.,

2021). Likewise, a survey of South Australian women found that 37.4% of women reported some form of urinary incontinence (Avery et al., 2014).

The current study findings show that there is a significant positive association between frequency and severity of urinary incontinence, resulting in women with the most frequent symptoms most likely to report the symptoms as severe. Other studies have chosen different data collection points to quantify the severity of urinary incontinence symptoms such as lifestyle limitations or degree of bother to assess severity. Avery et al. (2014) asked women how serious they thought their urinary incontinence symptoms were and how the symptoms limited their lifestyle, with 7.7% of women reporting their symptoms were 'very serious', which was often related to limitations in lifestyle and use of continence pads. A 'high degree of bother' was related to severe urinary incontinence symptoms in a study by Minassian et al. (2013), which was reported to impact women's quality of life. These findings are important in relation to the current study findings which report a significant proportion of women experiencing frequent and severe symptoms of urinary incontinence. For example, 34.9% of women's urinary incontinence was 'enough to wet underwear' and 10.8% of women experienced urinary incontinence every day. In relation to the international literature, it may suggest that a significant proportion of New Zealand women experience a poorer quality of life due to the high frequency or severity of urinary incontinence.

The current study findings show that urinary incontinence is associated with age. It is important to note that although pregnancy and birth are the greatest risk factors for pelvic floor dysfunction, these symptoms do not resolve over time, which stresses the importance of early healthcare intervention. As age increases, so does the prevalence of urinary incontinence, with women over 50 years of age most likely to experience some form of it. This finding is supported by the international literature, which reports increasing prevalence with advancing age (Abufaraj et al., 2021; Avery et al., 2014; Milsom & Gyhagen, 2019). Building on the study findings, Batmani et al. (2021), through a large systematic review and meta-analysis of older adults (55 to 106 years of age)

with urinary incontinence symptoms, found that prevalence continues to increase among older adults, highlighting that urinary incontinence may not peak during the post-menopause period (Batmani et al., 2021)

In addition to age, the current study found that ethnicity was also associated with urinary incontinence symptoms, with Māori and NZ European women reporting a higher prevalence of urinary incontinence than Pacific and Asian women. This is an important finding concerning possible implications for targeting of healthcare requirements to address equity of health outcomes. The study findings established that pregnancy had the strongest association with urinary incontinence of the variables investigated, with women who have been pregnant three times more likely to experience urinary incontinence than women who had not been pregnant before. This finding has been supported widely by the international literature (Minassian et al., 2008; Nygaard et al., 2008; Patel et al., 2022). Increasing parity was also associated with increased odds of urinary incontinence. This finding is supported by Nygaard et al. (2008) who also found an increasing prevalence of urinary incontinence with increasing pregnancy from zero to three-plus pregnancies (Nygaard et al., 2008). Nygaard et al. (2008) only quantified urinary incontinence in women with moderate-to-severe symptoms in contrast to the current study that measured all urinary incontinence symptoms, which may explain the difference in results.

Changing mode of delivery, increasing perineal tears and prevalence of urinary incontinence

The current study supported by the international literature demonstrates a likely increase in pelvic floor prevalence due to increasing assisted deliveries and perineal tears between 2003 and 2019. Hence is it likely that the prevalence of urinary incontinence reported in 2014/15 has increased and is likely to increase if the mode of delivery and perineal tear trends continue. The prevalence of urinary incontinence and other pelvic floor dysfunction symptoms varies depending on ethnic groups, as shown in the current study results, due to differences in mode of delivery and perineal tears. In addition to these obstetric factors, due to increasing urinary incontinence symptoms with

advancing age, the prevalence of urinary incontinence in New Zealand women may increase as there are more older women due to an the aging population (Stats NZ, 2022).

Considering the high prevalence of urinary incontinence and likely other pelvic floor dysfunction symptoms in New Zealand women, it is important to understand whether the health professionals involved in the care of women are supporting them in the prevention, diagnosis, and treatment of their pelvic floor dysfunction symptoms due to the known impact on the quality of life and longer-term health outcomes (Molina et al., 2023). Due to the strong association between pelvic floor dysfunction and pregnancy and birth, it is especially important that health professionals support women in the postnatal period.

Exploring women's experience of pelvic floor dysfunction within the postnatal period of accessing information, diagnosis, and treatment for their symptoms was the second aim of this study.

Pelvic floor dysfunction is likely endemic in the New Zealand female population, but women have not been prepared for symptoms throughout their perinatal journey.

The quantitative study findings show that pelvic floor dysfunction is likely highly prevalent in the New Zealand female population, with increased prevalence in the parous population. This finding was echoed through interviews with postnatal women who were shocked by the reported incidence of pelvic floor dysfunction symptoms from their cohort of new mothers, family, and friends. Women were surprised by the prevalent nature of their symptoms amongst their peers as they had very little knowledge of what pelvic floor dysfunction was, where to find information, or whether they should seek help for their symptoms. Poor awareness of pelvic floor dysfunction in new mothers is not exclusive to New Zealand, with studies from the UK and the Netherlands also reporting women had no or very little knowledge of pelvic floor dysfunction or that symptoms could occur after the birth of their baby (Gutierrez et al., 2019; Moosdorff-Steinhauser et al., 2023).

Women in the current study expressed confusion as to why they had not been educated about pelvic floor dysfunction antenatally by health professionals involved in their antenatal care. Gutierrez et al. (2019) found similar findings, reporting women would have preferred to have been educated antenatally, rather than processing the new information and pelvic floor dysfunction issues while caring for a new baby.

Due to health professionals' failure to provide pelvic floor dysfunction information, the current study findings show that women had to investigate their symptoms themselves. Due to a lack of information resources available, women turned to female family and friends. However, this approach was also problematic because these people often normalised or dismissed their symptoms as part of the cost of becoming a mother. Moosdorff-Steinhauser et al. (2023) also found that women gathered information from the internet or family and friends, which caused frustration to them as it was often contradictory. It is plausible that this societal normalisation amongst women may be due to their own prior experience with a lack of information and support. This societal normalisation can be harmful to women in the postnatal period, which can cause them to avoid or defer seeking healthcare support for their pelvic floor dysfunction symptoms (Rouhi et al., 2021; Wagg et al., 2017).

Informed consent is an important element of women's childbirth experience, and it is a health professional's responsibility to make sure women are informed of the risks and benefits of any procedure (New Zealand College of Midwives, 2016). Considering the quantitative findings, supported by the international literature associating mode of delivery and perineal tears with pelvic floor dysfunction, women should be informed and taught by health professionals about the possibility of pelvic floor dysfunction after birth. Through the current study findings, key informants note the importance of women having informed discussions about the possibility of pelvic floor dysfunction when planning childbirth. However, the postnatal women reported that this did not occur. This finding suggests that it is likely that women are not able to make informed decisions

about their birth plan and its possible impact on their pelvic floor health. As the risks of pelvic floor injury due to childbirth have become more well-known, clinicians have voiced their opinions about women's right to education about risk factors and choice regarding mode of delivery (Dietz & Wilson, 2005; O'Boyle et al., 2002).

Considering the study's findings about the association between perineal tears and pelvic floor dysfunction, the qualitative findings showed that women perceived not having enough information about their perineal tears or that their tear's healing had not been assessed. This finding was echoed in a large study by Lindberg et al. (2020) who similarly found that women in Sweden with perineal tears did not have enough information about the recovery or where to go for help. In light of the likelihood of women with perineal tears having a higher risk of experiencing pelvic floor dysfunction, it is surprising that health professionals do not prioritise better education about women's pelvic floor injury and recovery pathway.

Pelvic floor dysfunction is treated as a specialist issue

Although the current study findings indicate that pelvic floor dysfunction is an endemic issue in the female population, the study found that health professionals involved with women in the postnatal period are not prepared to assess, diagnose, or treat pelvic floor dysfunction. Postnatal women reported that when they did interact with some health professionals about their symptoms, they were shocked that they were normalised, dismissed, or that they were provided with contradictory information. This dismissive behaviour by health professionals may in part be due to their lack of knowledge, training, and capability in assessing or diagnosing pelvic floor dysfunction. This discomfort in assessing or diagnosing pelvic floor dysfunction is not only a problem in New Zealand. A recent study of American primary care providers found that many did not have the knowledge or capability to assess women for pelvic floor dysfunction or know when to refer them to specialist services. The study found that this was especially pronounced for pelvic organ prolapse and faecal incontinence, which were less commonly seen symptoms. Primary care providers felt more

confident referring patients when there was a specialist such as a gynaecologist within their multidisciplinary team, which is very rarely the case within the New Zealand primary care system (Weimer et al., 2024).

The study findings suggested that health professionals involved in the immediate care of women in the postnatal period such as midwives and GPs are not prepared to assess, diagnose, or treat women with pelvic floor dysfunction due to insufficient training. Key informants indicated that this may be due to the assessment or treatment of pelvic floor dysfunction requiring health professionals to undertake procedures which needed specialist training, such as fitting pessaries. This lack of confidence in assessing, treating, or referring women with pelvic floor dysfunction may be exacerbated by the lack of New Zealand screening and treatment guidelines for pelvic floor dysfunction symptoms. Key informants within the study highlighted that there are no good pelvic floor dysfunction screening or assessment guidelines for health professionals working within primary care in New Zealand, and that this is a barrier to health professionals proactively screening women or feeling capable of assessing women for pelvic floor dysfunction. Although out of date, a study of New Zealand GP competence in continence care found that most of them did not feel confident assessing and managing urinary incontinence and would value additional training on the subject (Dovey et al., 1996). Without more recent research, it would seem that primary care professionals' competence in assessing and treating pelvic floor dysfunction has not changed in over 20 years.

It is well known that women find discussing their pelvic floor dysfunction symptoms taboo or embarrassing, which prevents them from seeking care for their symptoms (Gutierrez et al., 2019; Moosdorff-Steinhauser et al., 2023; Snyder et al., 2022). These feelings of embarrassment about their symptoms were also expressed by women in this study. Women reported that they felt more comfortable discussing their symptoms with trusted health professionals who had cared for them during their perinatal journey. This finding solidifies the importance of primary care professionals involved in perinatal care being confident in assessing for pelvic floor dysfunction. Screening for

pelvic floor dysfunction symptoms is important within the context of pelvic floor dysfunction being a taboo issue for women. Due to the perceived embarrassment of pelvic floor dysfunction issues, women are less likely to disclose pelvic floor dysfunction symptoms to their health providers (Gutierrez et al., 2019). Key informants within this study suggested better guidance for health providers on how to screen for pelvic floor dysfunction and subsequently what support to provide for women. Validated pelvic floor questionnaires for women with pelvic floor disorders already exist, such as the Pelvic Floor Distress Inventory and the Pelvic Floor Impact Questionnaire (Barber et al., 2005). In addition, recently a Pelvic Floor Index screening tool for pelvic floor dysfunction in postpartum women has been developed for use in primary care settings (Geoffrion et al., 2023). These screening tools could easily be adopted into New Zealand primary care settings.

The study has found that the lack of competence in assessing pelvic floor dysfunction among health professionals involved in perinatal care, in addition to the concept of pelvic floor dysfunction being a specialist issue, has led to women either not receiving the correct advice or being referred back and forth to different health professionals. The 'passing of the buck' between health professionals not only causes fragmented care for women, but also adds additional cost barriers to seeing different health professionals, due to more specialised care sitting outside of the New Zealand public health funding.

There is limited provision for pelvic floor dysfunction treatment through the New Zealand public health system

The study findings implied that once the baby was born, publicly funded health professionals focused on ensuring the health of the baby and not the mother. The lack of a funded check-up for the mother postnatally surprised many women who thought that the six-week primary care check-up was for both mother and baby. This shift in healthcare from mother to baby has been experienced internationally. Carroll et al. (2013) reported that women felt their appointments with their GP were rushed and focused on their babies.

Other research suggests that women are not getting the support or healthcare they need postnatally from their primary care provider, instead wishing to see someone with the skills to assess and treat their pelvic floor dysfunction symptoms, such as a pelvic physiotherapist (Du et al., 2020; Gutierrez et al., 2019). Women in the current study reported similar thoughts, highlighting that their primary care providers/midwives were not adequately equipped to assess or teach pelvic floor muscle exercises.

The National Institute for Health and Care Excellence (NICE) recommends a period of supervised pelvic floor exercises as the first non-invasive management option for women with pelvic floor dysfunction (NICE, 2021a). The study found that for women to access this treatment option they had to be referred to a specialist pelvic physiotherapist, further consolidating the specialist nature of treating pelvic floor dysfunction. The study findings report that some women tried to access pelvic physiotherapy through the public system via a referral from their GP. However, the wait times were extremely long, and in some cases, women had a subsequent baby before being seen. To avoid long wait times, women accessed private pelvic physiotherapy, but this attracted a cost which was a barrier to some women. Poor access to pelvic physiotherapy is an international problem, with postnatal women reporting barriers to accessing the appropriate health professionals, expressing that they would like to be taught how to do their pelvic floor muscle exercises correctly (Du et al., 2020; Grant & Currie, 2020; Moosdorff-Steinhauser et al., 2021a).

The ACC did extend coverage to maternal birth injuries through the passing of the Accident Compensation (Maternal Birth Injuries and Other Matters) Amendment Bill) in 2022 (Parliamentary Council Office, 2022). This legislation now means that maternal birth injuries are covered by ACC, including pelvic physiotherapy treatment. However, in practice, this treatment still attracts a surcharge to patients accessing the care. The findings suggest that there is still confusion amongst healthcare providers and women about what the ACC scheme now covers regarding injuries and funding support.

In addition to the cost barriers (even with ACC cover), accessing pelvic physiotherapy in some locations across New Zealand is challenging. Pelvic physiotherapy is a speciality within the physiotherapy profession, so it is not as widely available, especially outside of urban locations. The current study found that this was prohibitive to some women facing long travel times, which led to them rationing their treatment. This issue of accessibility was also an issue in more rural parts of the USA (Snyder et al., 2022).

Recommendations

This study has added to the abundant international evidence that pelvic floor dysfunction is prevalent in New Zealand and is likely to increase over time due to changing birthing practices and associated pelvic floor trauma. There is a risk that if the New Zealand maternal health system does not adapt to better support postnatal women with pelvic floor dysfunction, more and more women will suffer from poor quality of life and poorer health outcomes as they age. The New Zealand maternal health system needs to adapt to better prevent pelvic floor dysfunction from occurring, and treat symptoms promptly and effectively when symptoms arise to prevent them worsening as women age, which may lead to surgical intervention. To achieve this shift in the orientation of healthcare professionals, including those in the primary care sector, and to better educate, prevent, support, and treat women with pelvic floor dysfunction, the following actions are recommended.

Recommendation One – pelvic floor dysfunction resources for women

The current study has found that many women are underprepared for the likelihood of pelvic floor dysfunction after birth. Women want to be able to educate themselves antenatally and postnatally on what they can do to prevent and treat pelvic floor dysfunction. Women reported that they were not able to find good resources to educate themselves about pelvic floor dysfunction. Continence NZ commissioned pelvic physiotherapists to create a guide for women's pelvic health through the perinatal period (Continence NZ, 2023). The 'Pregnancy Guide' guide provides excellent information and advice, which includes information about pelvic floor dysfunction, preventative

strategies during pregnancy such as pelvic floor muscle exercises and perineal massage, and what to do if women have symptoms after birth. This guide would be extremely valuable for all pregnant women, but it is not easily accessible and should be provided to all women by their LMC at the start of their antenatal journey.

In addition to pelvic floor information resources, antenatal education should include education on pelvic floor dysfunction during the postnatal period, preventative strategies, and where to seek help. This topic area should be added to the Health New Zealand Service Specification for Pregnancy and Parenting Information and Education (*Maternity Service Specifications – Health New Zealand | Te Whatu Ora, 2024*).

Recommendation Two – National clinical guidelines and training in pelvic floor dysfunction for health professionals involved in perinatal care

This study has found that the assessment and treatment of pelvic floor dysfunction has become a speciality within the health field, where knowledge is held by specialist pelvic physiotherapists and obstetrician/gynaecologists. In the perinatal period, women predominantly receive their healthcare through their LMC or primary care provider. However, the current study has found that these health professionals do not always have the skills to assess their pelvic floor dysfunction symptoms or give them basic advice.

National clinical guidelines for pelvic floor dysfunction through the perinatal period should be developed to support health professionals provide appropriate care to all women. All primary health professionals involved in the care of perinatal women should receive training on the pathophysiology of pelvic floor dysfunction, basic screening and assessment, and initial advice including teaching pelvic floor muscle exercises. This training should be included both in undergraduate education and through regular postgraduate professional development.

Recommendation Three – improved pelvic health physiotherapy provision in the public health system

This study has found that women are not able to access pelvic physiotherapy through the public health system because of extremely long wait lists, due in part to the specialism of pelvic physiotherapy. Some of these women were able to access pelvic physiotherapy privately, but this will be a considerable cost barrier to many New Zealand women. Considering pelvic floor muscle exercises are the recommended first line of treatment for pelvic floor dysfunction, women should be able to access this treatment through the public health system in a timely manner. Over the longer term the physiotherapy undergraduate degree should include training on pelvic floor physiotherapy so all physiotherapists have capability in assessing and treating pelvic floor dysfunction. In the short-to-medium term, the public health system should increase the number of pelvic physiotherapists it employs, or provide pelvic physiotherapy training to its musculoskeletal physiotherapists to improve access to this important treatment.

Recommendation Four – a six-week postnatal primary care check for the mother

At six weeks postpartum, responsibility for maternity care transfers from the LMC back to the woman's usual primary care provider. However, there is no formal funded appointment within primary care for a handover between providers, screening for common postnatal conditions, or the ability for women to ask about any medical concerns. The study found that women thought that the six-week check for the baby was a joint check for the baby and themselves, but they were disappointed that this was not the case.

This study's findings show that women do not know where to seek advice or help for their pelvic floor dysfunction symptoms, or are too embarrassed to seek help from a health professional. Key informants also raised this issue, citing that often health professionals need to ask about pelvic floor dysfunction symptoms to find out if the woman has been experiencing symptoms. A six-week check in the transition period back to primary care would enable women to raise any concerns, but

allow health professionals to screen them for pelvic floor dysfunction conditions, alongside other common postnatal conditions.

To support health professionals during the six-week check and to ensure consistent screening of pelvic floor dysfunction and other common postnatal conditions, screening, assessment, and referral guidance should be developed and provided to primary care providers. This is to ensure the screening process is adequate and providers know where to refer women to get appropriate treatment.

Recommendation Five – tackling the culture of normalisation

This study has found that symptoms of pelvic floor dysfunction have been normalised by women's family and social networks, as well as more broadly societally. Health professionals have not uncommonly minimised the problems, resulting in women thinking that they must suffer from their symptoms for the rest of their lives. Tackling societal culture change will be multifaceted, but health professionals and antenatal educators having open conversations with women about pelvic floor dysfunction is a good starting point. This requires better training for health professionals (Recommendation Two), time for screening and discussion about pelvic floor dysfunction within primary and community healthcare (Recommendation Four), and educating women about pelvic floor dysfunction in the perinatal period (Recommendation One).

Strengths and Limitations

This section outlines the methodological strengths and possible limitations of this research study.

Strengths

A key strength of the quantitative phase of this research was the use of the National Maternity Collection dataset. This dataset provided statistical, demographic, and clinical information about all publicly funded maternity services through pregnancy, birth, and three months postnatal

between 2003 to 2019. The scale of the dataset, in addition to the 17 years of data, provided exceptional insight into the birthing practices and perineal trauma over the time period in New Zealand.

The strength of the qualitative phase of the study was the rich qualitative data from the individual interviews with postnatal women and key informants. The semi-structured interviews allowed in-depth conversations between the interviewer and participant, which uncovered rich accurate data about women's postnatal experience with pelvic floor dysfunction. The benefit of also interviewing key informants allowed the wider health system context to be realised, in addition to confirmation of health system barriers women had identified which have embedded into the health system structure.

The study's mixed methodology was beneficial to quantifiably measure the growing problem of pelvic floor dysfunction within New Zealand and then understand how this problem manifests itself in human experience. This approach is valuable in health research, where the problems have an impact on people, and in this case women. The mixed methodology has provided a rich understanding of the epidemiology of pelvic floor dysfunction, but has also provided solutions that will make the maternity system better for women.

Limitations

There are some methodological limitations of this research, which could be rectified with further research.

First, within the quantitative phase of the study, the decision was made to group some variables into one variable. For example, both elective and caesarean sections were combined into 'caesarean section' and ventouse, forceps, and other types of assisted delivery were grouped into 'assisted delivery'. This decision was made following other research study practices, but also to keep the project size manageable. Future research could separate these variables. For example, it would be useful to compare the rates of pelvic floor dysfunction between women who had experienced

labour prior to an emergency caesarean section and women who had an elective caesarean section. In addition, this dataset was only complete until 2019, so the research cannot comment on whether the trends investigated have continued to the present day.

Secondly, the prevalence of urinary incontinence was investigated, and not the other two common symptoms of pelvic floor dysfunction (faecal incontinence and pelvic organ prolapse). This was due to the New Zealand Health Survey 2014/15 only including questions on urinary incontinence, which is the most common symptom of pelvic floor dysfunction. To maintain the scope of the study, further quantitative investigation into the prevalence of faecal incontinence or pelvic organ prolapse was not undertaken, but this could be explored in future research which could also update the estimated urinary incontinence prevalence to current day.

Lastly, the limitation within the qualitative phase of the study was the limited demographic variability within the group of postnatal women studied. Considering the taboo nature of discussing pelvic floor dysfunction symptoms, and the busy nature of mothers with young children, recruitment to this phase of the study was challenging. The group of women who participated in the individual interviews were predominantly educated women with higher socioeconomic means, with limited ethnic diversity. The findings from this study may not be generalisable to other demographic groups of women, such as those living in higher levels of deprivation or areas with high levels of Māori, Pacific, or other minority ethnic groups.

Implications for future research

Several areas of research could be completed to build on this study's findings.

First, the research has uncovered that assisted delivery is associated with perineal tears. As mentioned within the limitation section, it would be beneficial to understand what method of assisted delivery (e.g. ventouse or forceps) is associated with the increase in perineal tears. Using the same National Maternity Collection dataset, the separate assisted delivery variables could be statistically analysed to review any change in perineal tear association.

The research has also reported that caesarean section is protective against pelvic floor dysfunction. It would be beneficial to understand whether this is still the case for emergency caesarean section as some women may have progressed through labour. However, the current dataset does not quantify whether or for how long a woman has laboured before an emergency caesarean section.

As discussed, the qualitative results may not be generalisable to other demographic groups of women. It may be beneficial to undertake semi-structured interviews with other demographic groups of women such as Māori women or those living in areas of lower socioeconomic advantage to understand whether their experience with postnatal pelvic floor dysfunction differs.

The key informants interviewed in the qualitative stage of this study were health professionals interested in pelvic floor dysfunction and women's health. Further research interviewing a larger number of health professionals such as GPs may uncover different information and challenges. Finally, it would be useful to understand whether improving access to information, preventative strategies, or early treatment impacts women's experience of pelvic floor dysfunction. For example, an intervention study investigating whether providing women with good resources antenatally changed the experience for those women who have pelvic floor dysfunction symptoms in the postnatal period.

Conclusion

The purpose of this research was to determine whether there has been a change in the mode of delivery and trauma sustained to the pelvic floor through perineal tears, quantify the prevalence of known urinary incontinence, and estimate the likelihood of overall pelvic floor dysfunction prevalence in New Zealand. Additionally, it explores the experience of women living with pelvic floor dysfunction in the postnatal period.

The study has highlighted that the mode of delivery is changing in addition to increasing perineal tear trauma, both likely to increase the prevalence of pelvic floor dysfunction. Due to these

obstetric changes, pelvic floor dysfunction prevalence may have increased from the estimated high prevalence of urinary incontinence in 2014/15 (the most prevalent symptom of pelvic floor dysfunction). Importantly, the study has found that primary care and maternal health services are failing women with pelvic floor dysfunction. The maternal health system does not provide the training and resources required for health professionals involved in perinatal care to educate, assess, or treat pelvic floor dysfunction. The inadequate pelvic floor training during undergraduate and postgraduate health professional programmes (such as physiotherapy or midwifery), alongside the lack of national guidance for the prevention and treatment of pelvic floor dysfunction does not support health professionals to meet the needs of women with pelvic floor dysfunction in the perinatal period.

After birth, women with pelvic floor dysfunction symptoms are met with multiple barriers to accessing help. These barriers are framed by practitioners who work in this field and primary and maternal care treating pelvic floor dysfunction as a specialist issue, despite the fact that pelvic floor dysfunction symptoms are highly prevalent in the female population. This specialism has created a culture of normalisation, dismissal, and poor access to treatment that could help women resolve their pelvic floor dysfunction symptoms.

The findings from this research recommend a national approach to tackling the specialism and normalisation culture of pelvic floor dysfunction and improving women's access to education, prevention, and treatment options.

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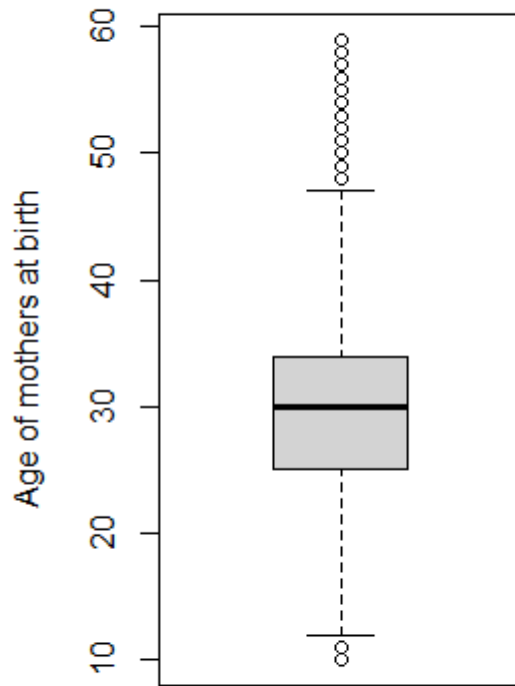
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Appendix 1: Age distribution of mothers



Appendix 2: Papers selected for quantitative literature review

	Author	Country	Study design	Data collection	Population at recruitment	Number of participants	Age	Type of PFD	Method of measurement
1	Ahlund et al. (2019)	Sweden	Prospective cohort	Self-administered questionnaire	Nulliparous women	410	11.2% <25 76.1% <25-35 12.7% >35	Urinary incontinence	Non-validated questionnaire
2	Berg et al. (2020)	Norway	Cross-sectional	Self-administered questionnaire and clinical examination	Primiparous and multiparous women	207	Mean – 31	Anal incontinence	St Marks Incontinence Score and endoanal sonography
3	Borge (2021)	Portugal	Prospective cohort	Self-administered questionnaire	Primiparous and multiparous women	207	31.4	PFD	Pelvic Floor Distress Inventory (PFDI-20)
4	Coll et al. (2021)	Spain	Cross-sectional	Self-administered questionnaire	Primiparous women	109	Not reported	Stress urinary incontinence	The International Consultation on Incontinence Questionnaire (ICIQ-SF) and the Pelvic Floor Distress Inventory (PFDI-20)

5	Dasikan (2020)	Turkey	Cross-sectional	Self-administered questionnaire	Primiparous and multiparous women	408	Mean – 30.5	PFD	Non-validated questionnaire
6	Everist et al. (2019)	Australia	Prospective cohort	Self-administered questionnaire	Nulliparous women	396	Not reported	Anal incontinence	St Marks Incontinence Score
7	Ferrari et al. (2021)	Italy	Prospective cohort	Self-administered questionnaire	Primiparous and multiparous women	6023	17.68% 16-30 71.33% 30-39 10.99% 40+	Urinary and anal faecal incontinence	Pelvic Floor Distress Inventory (PFDI-20)
8	Fritel (2019)	France	Prospective cohort	Self-administered questionnaire	Primiparous women	1668	Not reported	Anal incontinence	Non-validated questionnaire
9	Giugale et al. (2021)	USA	Prospective cohort	Self-administered questionnaire	Nulliparous women	173	26.8	Urinary incontinence	Epidemiology of Prolapse and Incontinence Questionnaires (EPIQ), Incontinence Severity Index (ISI) questionnaire
10	Huber et al. (2021)	Sweden	Prospective cohort	Self-administered questionnaire and clinical examination	Primiparous women	511	30.3	PFD	Not reported
11	Hill et al. (2021)	USA	Prospective cohort	Self-administered questionnaire and	Nulliparous women	825	28.8	PFD	Epidemiology of Prolapse and Incontinence

				clinical examination					Questionnaire (EPIQ), and the Incontinence Severity Index
12	Jansson (2021)	Sweden	Prospective cohort	Self-administered questionnaire	Nulliparous women	951	28.9	Urinary incontinence	Not specified
13	Johannessen (2020)	Norway	Prospective cohort	Self-administered questionnaire	Primiparous women	1571	28.3	Anal incontinence	St Marks Incontinence score
14	Moosdorff-Steinhauser (2021)	Netherlands	Cross-sectional	Self-administered questionnaire	Primiparous and multiparous women	415	30.6	Urinary incontinence	International Consultation on Incontinence Questionnaire Short Form (ICIQ-UI SF) International Consultation on Incontinence Questionnaire Lower Urinary Tract Symptoms
15	Nygaard et al. (2020)	USA	Prospective cohort	Self-administered questionnaire and clinical examination	Nulliparous women	825	28.9	PFD	Epidemiology of prolapse and incontinence questionnaire
16	O'Leary (2023)	Ireland	Prospective cohort	Self-administered questionnaire	Nulliparous women	295	33	PFD	Pelvic floor disability index (PFDI-20) Prolapse and Incontinence

									Knowledge Questionnaire
17	Palmieri (2021)	Italy	Prospective cohort	Self-administered questionnaire	Primiparous and multiparous women	2007	33.2	PFD	Italian pelvic floor questionnaire for pregnant and postpartum women
18	Siafarikas (2022)	Norway	Prospective cohort	Self-administered questionnaire	Nulliparous women	300	Not reported	PFD	International Consultation on Incontinence Questionnaire
19	Sigurdardottir (2021)	Iceland	Cross-sectional	Self-administered questionnaire	Primiparous women	858	27	PFD	Icelandic version of Australian Pelvic Floor Questionnaire
20	Snyder (2022)	USA	Cross-sectional	Self-administered questionnaire	Primiparous and multiparous women	472	29.3	PFD	Pelvic floor disability index (PFDI-20) Prolapse and Incontinence Knowledge Questionnaire
21	Rajavouori (2021)	Finland	Prospective cohort	Self-administered questionnaire	Primiparous and multiparous women	891	Not reported	UI	Not reported

Appendix 3: Papers selected for qualitative literature review

	Author	Country	Study design/data collection	Population at recruitment	Main findings
1	Carroll et al. (2023)	Ireland	Semi-structured online interviews	14 postpartum women Mean age 36.79 (+- 3.3) Mean parity 2 (+- 0.5)	Women faced many challenges getting a diagnosis of POP and then subsequent management. Women recommend that education about pelvic floor health is provided antenatally, and that they are screened for POP symptoms postnatally and referred for treatment promptly.
2	Du et al. (2021)	USA	Extracted relevant threads from an online postnatal forum	28 posts from 390 posts about POP	Women were unaware that POP could occur postnatally, and frustrated by the lack of discussion and support by health professionals, especially their primary care physician.
3	Du et al. (2020)	USA	Extracted relevant threads from an online postnatal forum	118 posts on urinary incontinence (UI)	Women did not feel that they had thorough care for their UI in the postnatal period. They did not get enough support to do pelvic floor exercises. Women wanted access to pelvic physiotherapy.
4	Grant et al. (2020)	UK	Online and face-to-face focus groups	31 postnatal women Aged between 28-43	Lack of postnatal care, especially for pelvic floor symptoms. Women wanted a physiotherapist to teach the exercises so they know that they are doing them properly.
5	Gutierrez et al. (2019)	UK	Semi-structured interviews	9 women (at 6 months postnatal)	Women did not expect UI issues post-birth and would have liked education during pregnancy.

					Physicians prioritised babies' wellbeing and maternal mental health and did not ask about pelvic floor issues.
6	Lindberg et al. (2020)	Sweden	Open-ended questionnaire	1007 women Mean age 31	Women wanted more information about their perineal tear and possible symptoms prior to leaving hospital. Women also wanted information on who to contact if they got complications, especially incontinence and constipation.
7	Milner et al. (2022)	Ireland	Online survey	657 women (16 postnatal period)	Women struggled to access healthcare for pelvic floor dysfunction in postnatal period during pandemic. When able to access care, appointments were online and not sufficient to help with symptoms.
8	Moosdorff-Steinhauser et al. (2021)	Netherlands	Digital survey	415 women Mean age 30.6 (+-4)	25% of women with UI postnatally sought help for their symptoms, and 92% of them say a pelvic physiotherapist. Women did not seek help as they thought their symptoms would go away on their own or it was causing minimal bother.
9	Moosdorff-Steinhauser et al. (2023)	Netherlands	Semi-structured interviews with women and focus groups with healthcare providers (HCPs)	7 postpartum women 1 focus group with HCPs	Women were unaware that UI could occur after birth, but were accepting that it was part of giving birth. Women expected their UI to be temporary. Few women actively sought help from HCPs, and instead looked at the internet or asked friends. HCPs did not routinely ask women about pelvic floor symptoms.
10	Snyder et al. (2022)	USA	Semi-structured phone interviews	25 women	Women had negative attitude towards their pelvic health and worried about future symptoms, but it was a low priority for intervention due to time restraints and self-care. Women used

					the internet or spoke to friends for advice. Women want health professionals to ask about pelvic health.
11	Yount et al. (2020)	USA	Questionnaire at 8 weeks, 3 and 6 months postnatal	418 women Mean age 31.4	Most women used books or the internet to find out about pelvic floor health postnatally.
12	Royal College of Obstetricians and Gynaecologists	UK	Survey	2000 women	<p>53% of women with pelvic floor dysfunction symptoms had not sought help from HCP. Of these, 39% thought their symptoms were normal and 21% were too embarrassed.</p> <p>Of those with symptoms, only 55% of women had previously done pelvic floor muscle training with 25% not knowing how to do this..</p> <p>The College calls for HCPs to use their regular interactions with women in the perinatal period to ask about pelvic floor dysfunction</p>

Appendix 4: Oral consent form



Consent Form

Oral Consent Protocol

Project title: The prevalence and experience of female pelvic floor dysfunction (PFD) in Aotearoa New Zealand.

Project Supervisor: Associate Professor Catherine Cook

Researcher: Laura Seary

The participant joins the videoconference

- Do you agree to my recording your consent to participate?
- If they agree, then the record function will be activated and they will be asked the following:
- Have you read and understood the information provided about this research project in the Information Sheet dated 06.03.24.
- Do you have any questions about the research?
- Do you understand that notes will be taken during the interviews and that the in interview will also be audio-recorded and transcribed?
- Do you understand that taking part in this study is voluntary (your choice) and that you may withdraw from the study at any time without being disadvantaged in any way?
- Do you understand that if you withdraw from the study then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used? However, once the findings have been produced, removal of your data may not be possible.
- Do you agree to take part in this research?
- Do you wish to receive a summary of the research findings? Yes/No
- Do you want me to send you a copy of the audio recording for this consent? Yes/No
- Please confirm you name and contact details

Participant's name:

Participant's Contact Details (if appropriate):

.....

.....

I will now turn off the recording of the Consent and then will start a separate recording for the interview.

Approved by the Auckland University of Technology Ethics Committee on 12 April 2022 on which the final approval was granted AUTEK 22/50

Note: The Participant should retain a copy of this form.

Appendix 5: Participant information sheet – postnatal women



Participant Information Sheet

Post-natal women

Date Information Sheet Produced:

06.03.24

Project Title

Research on the experiences of women with bladder and/or bowel symptoms after having a baby

An Invitation

My name is Laura Seary and I am a doctoral student at Auckland University of Technology. I am interested in the experience of women who have had bladder and/or bowel symptoms after the birth of their baby.

I wish to investigate how women with one or more symptoms experienced healthcare or treatment in the year following the birth of their baby.

What is the purpose of this research?

The purpose of this research is to explore how women with bladder and/or bowel symptoms experienced healthcare or treatment in the year following the birth of their baby.

This research will contribute to my Doctor of Health Science degree. The findings of this research may be used for academic publications and presentations.

How was I identified and why am I being invited to participate in this research?

As part of this research, I will be conducting individual interviews with women who are within one year of giving birth. The discussion will include how participants have experienced getting support or help for their symptoms after the birth of a child.

You have been identified for this study by replying to an advertisement to register your interest in this study. You must have given birth within the last year to be eligible for this study. It does not matter if it is your first birth, or you have given birth previously.

How do I agree to participate in this research?

If you would like to participate in this research, please email me at seary.laura@gmail.com and I will send you information about joining a discussion and provide you with a consent form to complete.

Your participation in this research is voluntary (it is your choice) and whether or not you choose to participate will neither advantage nor disadvantage you. You are able to withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

What will happen in this research?

The informal discussion will be scheduled for a time that suits you and will take place online. The discussions will be recorded.

What are the discomforts and risks?

I acknowledge that the topic of bladder and bowel problems may be uncomfortable or embarrassing. You do not need to discuss anything that makes you feel uncomfortable or embarrassed.

How will these discomforts and risks be alleviated?

The discussion will remain confidential, and you can stop and leave the discussion at any time.

What are the benefits?

This research will help me obtain a Doctor of Health Science degree. Importantly, this research will allow me to explore how women with symptoms of bowel and bladder problems feel about how they are treated after they have given birth. This information may contribute towards academic publications.

How will my privacy be protected?

Your names and identities will not be included in my research. Your contact details will be kept securely by myself and destroyed after the interview. The consent forms will be held securely by AUT for six years before they are destroyed. In accordance with the Privacy Act 2020, you have the right to request information about you that is collected and stored by the researcher.

What are the costs of participating in this research?

There is no cost to participate in the research. The discussion will take up to 60 minutes of your time.

What opportunity do I have to consider this invitation?

You have one month to consider this invitation.

Will I receive feedback on the results of this research?

Yes, you will receive a summary of the research findings.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Associate Professor Catherine Cook, Catherine.cook@aut.ac.nz.

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEK, ethics@aut.ac.nz, (+649) 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

About the researcher

I am a Doctor of Health Science Student at AUT. My full-time job is as a Policy Manager at the Ministry of Health. I live in Wellington with my husband and a very busy 20-month-old boy.

Researcher Contact Details:

Laura Seary (Researcher)

Email: Bbf5274@autuni.ac.nz

Phone: 0275452535

Project Supervisor Contact Details:

Associate Professor Catherine Cook

Email: Catherine.cook@aut.ac.nz

Phone: 000-0003-3976-6858

Approved by the Auckland University of Technology Ethics Committee on 12 April 2022, AUTEK Reference number 22/50

Appendix 6: Participant information sheet – health professionals



Participant Information Sheet

Health professionals

Date Information Sheet Produced: 11 April 2022

Project Title

The prevalence and experience of female pelvic floor dysfunction (PFD) in Aotearoa New Zealand.

An Invitation

I am a student at AUT completing a Doctor of Health Science degree. I am interested in how women with symptoms of pelvic floor dysfunction (PFD) (urinary incontinence, faecal incontinence and pelvic organ prolapse) experience accessing healthcare and treatment during their postnatal period (1 year post birth).

I wish to investigate what health professionals involved in women's post-natal care think about how the health system supports women to get a diagnosis of PFD and receive appropriate treatment.

What is the purpose of this research?

The purpose of this research is to estimate how many women experience symptoms of pelvic floor dysfunction in New Zealand and to explore how women with symptoms of PFD feel about the healthcare or treatment they receive for PFD during the post-natal period.

This research will contribute towards my Doctor of Health Science degree. The findings of this research may be used for academic publications and presentations.

How was I identified and why am I being invited to participate in this research?

As part of this research, I will be conducting individual interviews with women in the post-natal period and health professionals involved in women's post-natal care.

You have been identified as being a health professional involved in women's post-natal care. You replied to an advertisement.

How do I agree to participate in this research?

If you would like to participate in this research, please email me on bbf5274@autuni.ac.nz and I will send you information about joining a discussion and provide you with a consent form to complete.

Your participation in this research is voluntary (it is your choice) and whether or not you choose to participate will neither advantage nor disadvantage you. You are able to withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

What will happen in this research?

The informal discussion will be scheduled for a time that suits you and will take place on a secure online platform. The discussion will be recorded.

What are the discomforts and risks?

Your name will not be included in my research, however due to small number of health professionals in some professional groups some assumptions may be able to be made about possible health professionals' identity in the results.

How will these discomforts and risks be alleviated?

The discussion will remain confidential, and you can stop or leave the discussion at any time.

What are the benefits?

This research will help me obtain a Doctor of Health Science degree. Importantly this research will allow me to explore how women with symptoms of PFD feel about the treatment they receive for PFD in the post-natal period and understand what health professionals think about how the current health system supports women with PFD. This information may contribute towards academic publications.

How will my privacy be protected?

Your names and identities will not be included in this research. Your contact details will be kept securely by myself and destroyed after the interview. The consent forms will be held securely by AUT for six years before they are destroyed. In accordance with the Privacy Act 2020, you have the right to request access to the information about you that is collected and stored by the researcher.

What are the costs of participating in this research?

There is no cost to participate in the research. The interview will take up to one hour of your time.

What opportunity do I have to consider this invitation?

You have one month to consider this invitation.

Will I receive feedback on the results of this research?

Yes, you will receive a summary of the research findings.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Associate Professor Catherine Cook, Catherine.cook@aut.ac.nz, 000-0003-3976-6858

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEK, ethics@aut.ac.nz, (+649) 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details:

Laura Seary, bbf5274@autuni.ac.nz, 0275452535

Project Supervisor Contact Details:

Associate Professor Catherine Cook, Catherine.cook@aut.ac.nz, 000-0003-3976-6858

Approved by the Auckland University of Technology Ethics Committee on 12 April 2022, AUTEK Reference number 22/50.

Appendix 7: Recruitment flyer – postnatal women



Research on the experiences of women with bladder and/or bowel symptoms after having a baby

- **Have you had a baby in the last year?**
- **Did or do you suffer bladder and/or bowel symptoms after the birth of your baby?**
- **Can you share your experiences about the healthcare and treatment you received, and discuss how to make other women's experiences better in the future?**

My name is Laura Seary. I live with my husband and toddler in Wellington. I'm a Doctoral student at Auckland University of Technology.

My doctoral research aims to explore the experiences of women who had/have bladder and/or bowel symptoms after the birth of their baby.

Bladder and/or bowel symptoms could include:

- urine leaking
- bowel control issues
- pelvic heaviness.

I want to hear women's experiences of the healthcare and treatment they received for these symptoms.

I'm holding an online group discussion, where up to eight women will gather to discuss:

- The focus by healthcare professionals on your wellbeing and recovery from birth
- Your experience of regaining bladder and bowel control
- Where you got information about your bladder and bowel symptoms
- If you were referred to another health professional (eg. a physiotherapist).

We'll spend 60-90 minutes together on a video call.

If you are interested in participating in this study, please contact me via email: bbf5274@autuni.ac.nz, or phone 027 545 2535. The focus groups will be held at the end of February/March.

I'll send you more information about the research and our discussion.

Appendix 8: Recruitment flyer – health professionals



Your experience managing women with pelvic floor dysfunction in the postnatal period

This research aims to estimate how many women experience symptoms of pelvic floor dysfunction (PFD) in New Zealand and to explore how women with symptoms of PFD feel about the healthcare or treatment they receive after the birth of their baby.

What's involved?

You will complete one group discussion with up to 8 other similar health professionals. The discussion will last between 60-90 minutes and take place over a zoom video call.

The focus group will include questions about:

- Your experience of managing women with pelvic floor dysfunction
- Confidence in assessment and referral/treatment of women with pelvic floor dysfunction
- Health system support for women with pelvic floor dysfunction in the post-natal period

Eligibility Criteria

- You are a registered health professional working in New Zealand
- You manage women with symptoms or pelvic floor dysfunction and/or women in the postnatal period.

How do I agree to participate in this research?

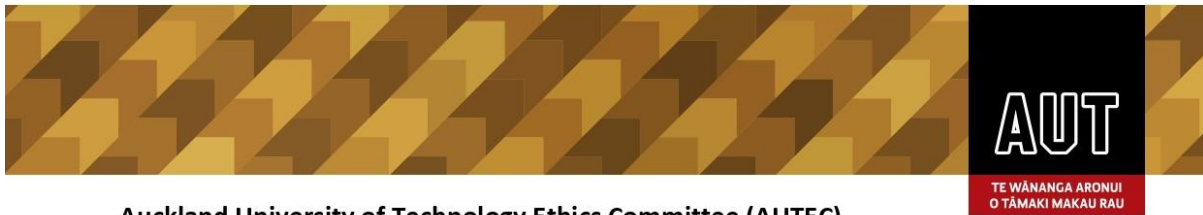
If you are interested in participating in this study, please email me and I will send you further information about the research and how to join a discussion.

Laura Seary

Email: bbf5274@autuni.ac.nz

Phone: 0275452535

Appendix 9: Ethics approval



Auckland University of Technology Ethics Committee (AUTEC)

Auckland University of Technology
D-88, Private Bag 92006, Auckland 1142, NZ
T: +64 9 921 9999 ext. 8316
E: ethics@aut.ac.nz
www.aut.ac.nz/researchethics

12 April 2022

Catherine Cook
Faculty of Health and Environmental Sciences

Dear Catherine

Re Ethics Application: **22/50 The prevalence and experience of female pelvic floor dysfunction in Aotearoa New Zealand**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 12 April 2025.

Non-Standard Conditions of Approval

1. Please ensure that the role of the researcher as a policy manager within the Ministry of Health is disclosed in the Information Sheet. AUTEC advises that potential participants need this information to make an informed decision, in that they can either choose not participate (power imbalance), or choose to participate because they see a vehicle which may enable change.

Non-standard conditions must be completed before commencing your study. Non-standard conditions do not need to be reviewed by AUTEC before commencing your study, but please forward the updated Information Sheet(s) for file.

Standard Conditions of Approval

1. The research is to be undertaken in accordance with the [Auckland University of Technology Code of Conduct for Research](#) and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard and that all the dates on the documents are updated.
8. AUTEC grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted and you need to meet all ethical, legal, public health, and locality obligations or requirements for the jurisdictions in which the research is being undertaken.

Please quote the application number and title on all future correspondence related to this project.

For any enquiries please contact ethics@aut.ac.nz. The forms mentioned above are available online through <http://www.aut.ac.nz/research/researchethics>

(This is a computer-generated letter for which no signature is required)

The AUTEC Secretariat
Auckland University of Technology Ethics Committee

Cc: Bbf5274@autuni.ac.nz; eamon.merrick@aut.ac.nz

Appendix 10: Ethics amendment



Auckland University of Technology Ethics Committee (AUTEK)

8 March 2024

Catherine Cook
Faculty of Health and Environmental Sciences

Dear Catherine

Re: Ethics Application: **22/50 The prevalence and experience of female pelvic floor dysfunction in Aotearoa New Zealand**

Thank you for your request for approval of amendments to your ethics application.

The amendment to the data collection (individual interviews) has been approved..

Non-Standard Conditions of Approval

1. Ensure the recruitment is updated to 'interviews' and in the Information Sheet remove the reference to 'joining discussion' as this is likely to be a reference to the focus groups.

Non-standard conditions do not need to be submitted to or reviewed by AUTEK unless requested but must be completed before commencing your study.

Standard Conditions of Approval

1. The research is to be undertaken in accordance with the [Auckland University of Technology Code of Conduct for Research](#) and as approved by AUTEK.
2. All public facing documents must have the AUTEK approval number and be of a high standard of spelling and grammar. Dates on the Information Sheet(s) and Consent Form(s) must be consistent.
3. Any amendments to the project must be approved by AUTEK prior to being implemented.
4. A progress report is due annually on the anniversary of the approval date.
5. A final report is due at the expiration of the approval period, or, upon completion of project.
6. Any serious or adverse events must be reported to AUTEK, this includes unforeseen issues that might affect continued ethical acceptability of the project.
7. AUTEK grants ethical approval only. You are responsible for obtaining management permission for access from any institution or organisation at which your research is being conducted and you need to meet all ethical, legal, public health, and locality obligations or requirements for the jurisdictions in which the research is being undertaken.

The application number and title need to be referenced on all correspondence related to this project.

All forms are available online <http://www.aut.ac.nz/research/researchethics>

For any enquiries, please contact ethics@aut.ac.nz

(This is a computer-generated letter for which no signature is required)

The AUTEK Secretariat
Auckland University of Technology Ethics Committee

Cc: Bbf5274@autuni.ac.nz; eamon.merrick@aut.ac.nz

Appendix 11: Interview Questions

- Would you be able to tell me about when you first started getting symptoms of pelvic floor dysfunction and what impact that might have had on you?
- Did you know you could get these symptoms after the birth of your baby? If so, how did you know this?
- Did you, or have you, sought advice from a healthcare professional for the symptoms? Who did you seek help from, and was it useful?
- If you have symptoms and have not sought help, please tell me why?
- Did you feel listened to by the health professional you sought help from? Did they refer you to someone else- if so, who?
- What would have improved your experience with your pelvic floor symptoms in the postnatal period?