



Coping strategies and psychological interventions in women with infertility: a rapid review

T Sardinha

 **[orcid.org/ 0000-0003-2089-5051](https://orcid.org/0000-0003-2089-5051)**

Mini-dissertation submitted in partial fulfilment of the requirements for the degree *Master of Arts in Clinical Psychology* at the North-West University

Supervisor: Prof K Botha

Examination: May 2020

Student number: 30634679

Table of Contents

Acknowledgements	i
Summary	ii
Opsomming	iv
Permission to submit	vi
Declaration by researcher	vii
Declaration by language editor	viii
Author guidelines	ix
Chapter 1: Literature Review	1
Introduction	1
The Importance of Parenthood	1
Biological needs	1
Psychological needs.....	1
Social needs	2
Infertility	2
Definition of infertility	3
Infertility types	3
Prevalence of infertility	4
Causes of infertility	5
The impact of infertility.....	6
Psychological impact.....	6
Social impact	8
Financial impact	9
Coping with infertility	9
Types of coping strategies	10
Infertility treatment options	11

Medical infertility treatment	11
Psychological treatment.....	12
Conclusion.....	13
References	14
Chapter 2: Manuscript for submission.....	26
Abstract	27
Introduction	28
Method.....	31
Research design	31
The search strategy	31
Keywords.....	31
Databases	32
Inclusion and exclusion criteria.....	32
Critical appraisal.....	33
Data extraction.....	34
Data analysis.....	43
Ethical issues	43
Results.....	44
Aim 1 – Coping	45
Active coping.....	46
Emotion regulation strategies.	46
Cognitive coping strategies	47
Social coping strategies.	49
Physical coping strategies.....	49
Avoidance coping.....	49
Active avoidance coping.	50

Religious and spiritual coping	51
Positive religious coping.	51
Negative religious coping.....	52
Aim 2 – Psychological interventions.....	52
Factors influencing interventions.	53
Readiness for intervention.	53
Influence of cultural and religious beliefs.	54
Development of coping skills.....	55
Cognitive coping interventions.....	55
Problem-focused interventions	55
Emotion-focused coping training.	56
Mindfulness-based interventions.....	56
Discussion	56
Limitations	63
Recommendations.....	64
Conclusion	65
References	67
Chapter 3: A Brief Critical Reflection.....	80

List of Figures

Figure 1. Search, relevancy and critical appraisal process.....	34
Figure 2. A visual representation of themes and subthemes related to aim 1 (coping with infertility).....	45
Figure 3. A visual representation of theme and subthemes related to aim 2 (psychological interventions for infertile women.....	53

List of Tables

Table1. Data extraction table.....	35
------------------------------------	----

Acknowledgements

To my dearest parents, Izilda and Joe, who have guided me and supported me throughout the entirety of this journey. Your unconditional love, words of wisdom and encouragement have allowed me to exceed my own expectations. You both have provided me with the comfort and nurturance to flourish, whilst both being so selfless. I will forever be grateful for the privilege of having parents like you.

To my fiancé, Tyrone, I am so grateful for your continuous understanding, companionship and care. Your support and beam of positivity helped me to push through times when I thought I was unable to. Thank you for being by my side, for always believing in me and managing to put a smile on my face despite the surmountable amount of stress.

To my family and friends who have been there for me since the start. You have all been a wonderful network of ongoing support, always willingly lending an ear and providing much needed company and encouragement throughout.

Finally, a deep felt thank you to my research supervisor, Professor Karel Botha, for his unwavering patience, continuous guidance and unending knowledge. Without any of this none of this would have been possible.

Summary

The aim of this study was to review the available scientific literature on the coping strategies employed by women with infertility, as well as the types of psychological interventions used in addressing their infertility-related difficulties. More specifically, it aims to (a) identify coping strategies used, (b) describe psychological interventions used to address primary and secondary infertility, and (c) make treatment recommendations specifically regarding infertile women in developing countries.

A rapid review was conducted to obtain data to be able to address the research question. Keywords were identified during a general review of psychology journals and textbooks related to the topic. Boolean operators were matched with the keywords, their most common synonyms and the inclusion criteria to identify three search levels. EBSCO Discovery Services (EDS), a search engine that provides access to the resources of 73 international and national databases, was used as the search portal. The Joanna Briggs Institute (JBI) guidelines were used to identify relevant and high-quality scientific studies. From the initial 307 studies identified, only 23 met the selection criteria of the study. Most of the studies included were done in developing countries like Ghana, India, Iran, Israel, Mali, Mexico, South Africa, and Turkey. A thematic synthesis, based on Thomas and Harden's approach (2008), was used to analyse the data.

The main findings indicated that the experience of infertility is a personal challenge that interferes with important life goals or needs and requires effective coping. Similar to those found in other contexts, coping strategies as a response to infertility may promote or decrease psychological well-being. In confirmation of the general coping literature, active coping was particularly adaptive due to the utilisation of strategies like problem-solving, meaning, and acceptance. While the positive reappraisal of infertility seems to enable individuals to maintain or develop hope, as well as a more positive future outlook, and more effective

problem-solving, appraising infertility only or primarily as a loss elicited avoidance coping strategies like fatalism and wishful thinking. Both positive religious and social coping seem to have been adaptive for infertile women. Positive religious coping provides a resource that addresses the personal nature of infertility and the identity challenge it often presents. Being socially accepted and able to rely on others is a deeply engrained human need – it is therefore no surprise that social support is such an important resource when individuals are confronted with infertility.

It was further found that readiness for intervention (indicated by, for example, level of stress and perception of control, as well as the influence of cultural and religious beliefs) seems to be an important factor to take into account prior to and during counselling women with infertility. Psychological intervention available for addressing infertility primarily includes cognitive, problem-focused, emotion-focused, and mindfulness-based interventions. Different types of interventions addressed different consequences of infertility, but focused primarily on distress, depression, well-being, emotional regulation, and perception of control.

It was recommended that further research needs to be done to better understand the psychological experience of infertility, the way society perceives infertility, and finally the extent to which counselling guidelines need to be tailored for specific cultural contexts. Key aspects have been identified that may improve the effectiveness of psychological interventions for infertile women and therefore improve their ability to cope.

Keywords: Infertility, women, coping strategies, psychological interventions, rapid review

Opsomming

Die doel van hierdie studie was om 'n oorsig te doen van die beskikbare wetenskaplike literatuur oor copingstrategieë van vroue met onvrugbaarheid, asook die sielkundige intervensies wat gebruik word om hulle uitdagings aan te spreek. Die studie het meer spesifiek ten doel om (a) copingstrategieë te identifiseer, (b) sielkundige intervensies om primêre en sekondêre onvrugbaarheid te hanteer te beskryf, en (c) aanbevelings vir sielkundige hantering, veral vir onvrugbare vroue in ontwikkelende lande, te maak.

'n Snel-oorsig ('rapid review') is gedoen om data te genereer wat die navorsingsvraag sou antwoord. Sleutelwoorde is geïdentifiseer tydens 'n algemene oorsig van verwante sielkunde joernale en teksboeke, en daarna met sinonieme en insluitingskriteria volgens drie Boolean-vlakke aangedui vir die soektog. EBSCO Discovery Services (EDS), 'n soekenjin wat toegang tot 73 internasionale en nasionale databasisse verskaf, is hierna gebruik om die soektog te doen. Riglyne van die Joanna Briggs Institute (JBI) is gebruik om relevante studies van hoë wetenskaplike kwaliteit te vind. Van die 307 studies wat aanvanklik gevind is, het slegs 23 aan die kriteria vir die huidige studie voldoen. Die meeste van hierdie studies is gedoen in ontwikkelende lande soos Ghana, Indië, Iran, Israel, Mali, Mexiko, Suid-Afrika en Turkye. 'n Tematiese sintese, gebaseer op Thomas en Harden (2008) se benadering, is gebruik om die data te ontleed.

Die hoof-bevindinge dui daarop dat die belewenis van onvrugbaarheid 'n persoonlike uitdaging is wat in kompetisie is met belangrike lewensdoelwitte en behoeftes, en wat effektiewe coping vereis. Net soos in ander kontekste, kan copingstrategieë in reaksie op onvrugbaarheid sielkundige welstand egter bevorder óf verminder. Wat as 'n bevestiging van die algemene literatuur beskou kan word, was aktiewe coping aanpassend, veral omdat dit strategieë soos probleemoplossing, betekenisgewing en aanvaarding ingesluit het. Terwyl 'n positiewe evaluering van onvrugbaarheid daartoe bydra dat vroue hoop kon behou of

ontwikkel, asook 'n meer positiewe toekomsblik en beter probleemoplossingsvaardighede toepas, het die evaluering van onvrugbaarheid primêr as 'n verlies vermydingstrategieë soos fatalisme en wensdenkery ontlok. Verder blyk beide positiewe religieuse en sosiale coping ook aanpassend vir vroue te wees. Positiewe religieuse coping blyk 'n bron te wees wat die persoonlike aard en identiteits-verwante uitdagings van onvrugbaarheid aanspreek. Sosiale aanvaarding en ondersteuning daarteenoor is 'n diep gesetelde menslike behoefte, en is dit daarom nie 'n verrassing dat dit 'n belangrike bron in hierdie konteks is nie.

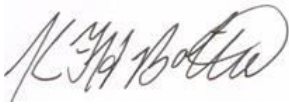
Dit het verder na vore gekom dat vroue se gereedheid vir intervensie bepaal word deur onder andere hulle vlakke van stres, persepsie van beheer, asook hulle kulturele en geloofsoortuigings, en dat hierdie faktore belangrik is om in ag te neem. Sielkundige intervensies wat gebruik word om vroue se belewenis en hantering van onvrugbaarheid te hanteer, sluit hoofsaaklik kognitiewe-, probleemgefokusde-, emosiegefokusde- en 'mindfulness'-gebaseerde intervensies in. Verskillende intervensies spreek verskillende aspekte van onvrugbaarheid in, maar fokus primêr op die hantering van distres en depressie, asook die verbetering van welstand, emosieregulering en persepsie van beheer.

Daar is aanbeveel dat verdere navorsing gedoen moet word om die sielkundige belewenis van onvrugbaarheid, die manier waarop die breë gemeenskap dit verstaan, asook die mate waartoe intervensie-riglyne vir spesifieke kulturele kontekste aangepas behoort te word, beter te verstaan. Sleutel-aspekte is geïdentifiseer wat die effektiwiteit van sielkundige intervensies kan verbeter en sodoende onvrugbare vroue se vermoë om te cope, kan verbeter.

Sleutelwoorde: Onvrugbaarheid, vroue, copingstrategieë, sielkundige intervensie, snel-oorsig

Permission to submit

I, the supervisor of this study, hereby declare that the mini-dissertation entitled “Coping strategies and psychological interventions in women with infertility”, written by Tarryn Sardinha, does reflect the research regarding the subject matter. I hereby grant permission that she may submit the article for examination purposes and I confirm that the dissertation submitted is in fulfilment of the requirements for the degree Magister of Arts in Clinical Psychology at the Potchefstroom Campus of the North-West University. The article may also be sent to the *South African Journal of Psychology* for publication purposes.



Prof Karel Botha

Research supervisor

Declaration by researcher

I hereby declare that this research titled **Coping strategies and psychological interventions in women with infertility: a rapid review** is entirely my own work and that all sources have been fully referenced and acknowledged.



Tarryn Sardinha

Student number: 30634679

Declaration by language editor

This confirms that I have electronically edited **Coping strategies and psychological interventions in women with infertility: a rapid review** by Tarryn Sardinha to conform with the latest conventions of style and expression. This included control of the table of contents, uniformity of layout, numbering and font (formatting), control of cross-references, formatting of text references and bibliographic detail, and editing language, academic style, content, contradictions or sentence construction.

Yours sincerely

A handwritten signature in black ink, appearing to be 'Simone Wilcock', written in a cursive style.

Simone Wilcock

12 December 2019

Language Editor

Tel: 076 532 8808

Email: sim1wi@gmail.com

Author guidelines

South African Journal of Psychology

The South African Journal of Psychology is owned by SAGE Publications and publishes peer-reviewed empirical research including review articles, theoretical and methodological papers, book reviews and short communications from all fields of psychology in English. Priority is given to research that is applicable to an African context and addresses psychological matters related to social change and development.

Manuscript requirements

Manuscripts must be written in English and be of a high grammatical standard and adhere to the publication guidelines of the American Psychological Association 6th edition (APA 6th). The research should comply with the Committee on Publication Ethics' International Standards for Authors. Authors should be transparent and ensure the originality of their work and that sources of information are appropriately cited. Articles submitted will be checked for plagiarism.

SAGE is a supporting member of ORCID, the Open Researcher and Contributor ID which provides a researcher with a persistent digital identifier that differentiates researchers from one another and allows for automated linkages between researchers and their professional activities. Authors and co-authors are encouraged to link their ORCID to the Journal of Psychology's online peer review platforms.

Manuscript format

The article should be written according to SAGE house style and text should be 12 point, double-spaced throughout, with a minimum 3cm left and right margins and 5cm header and footer. Submission should not exceed 5500 words which includes references, table and figures. The following format is required:

- Introductory or literature review section with no heading required.

- Headings and subheadings should be used for Method (inclusive of participants, instruments, procedures, ethical considerations and data analysis), Results, Discussion, Conclusion and References.
- Ethical consideration section with inclusion of the name of the institution that provided ethical approval for the study.

Keywords and abstracts. An abstract should not exceed 250 words and include up to six alphabetised keywords. The aim of the abstract and keywords is to enable readers to find the article with ease.

Artwork, figures and other graphics. Any illustrations, pictures and graphs should be presented in an electronic format and be of the highest quality. The common format of pictures should be TIFF or JPEG with a minimum resolution of 300 dpi. In terms of placement, MS Word created figures/charts and tables should appear in the main text instead of at the end of the document. If made outside of MS Word the content should be submitted separately with a placeholder note [insert Figure 1] appearing in the text. Images submitted in colour will be published online in colour but in print will appear in black and white. Artwork should not exceed the dimensions of the journal and any lettering thereof should not differ in size and type significantly.

Reference style. The article will adhere to the latest edition of the APA manual of instructions for authors.

- In text references: In text references cited for the first time are presented by surname and year in parentheses, for example: Bradley, Ramirez and Soo (1999) or (Bradley, Ramirez, & Soo, 1999). Subsequent citations with more than two authors should use et al., for example: Bradley et al. (1999) or (Bradely et al., 1999).
- Reference list: A full set of references should be provided at the end of the article alphabetically. References to journals should include the following: Surname and

initials of all authors, year of publication in brackets, title of the article, name of the publication, volume number, issue number (if provided), inclusive page numbers and digital object identifier (DOI). References to books should include the following:

Surname and initials of all authors, year of publication in brackets, place of publication and publisher's name. Examples of references are presented below:

Journal article

Hansell, P. L., Thorn, B. E., Pretnic-Dunn, S., & Floyd, D. L. (1998). The relationships of primary appraisals of infertility and other gynecological stressors to coping. *Journal of Clinical Psychology*, 5(2), 133-145. doi: 10.1023/A:1026238530050

Book

Lazarus, R. S., & Folkman, S. (1984). The coping process: An alternative to traditional formulations. *Stress, Appraisal, and Coping*. New York, NY: Springer.

Chapter in a book

Cronkite, R. C., & Moos R. H. Life context, coping processes, and depression. In E. E. Beckham, & W. R., Leber WR (Eds.), *Handbook of depression* (pp. 569–587). New York: Guilford Press.

English language editing services. The language used in the manuscript should be accurate and of quality. The manuscript can be submitted for professional editing and the use of SAGE Language Service can be considered.

Chapter 1: Literature Review

Introduction

This chapter aims to introduce and define the key concepts related to the study. The overview will focus on defining both primary and secondary infertility, the prevalence of infertility specifically in developing countries and the impact thereof. The last section will focus on overviewing the coping strategies utilised by women experiencing infertility, as well as available psychological interventions.

The Importance of Parenthood

Parenthood is deemed one of the major transitions in adult life (Hardeep, Rohtash, & Rohtash, 2009). The ability to procreate and bear children is an important personal and socio-cultural task that is linked to long-term well-being (Liamputtong & Benza, 2018; Saxbe, Rossin-Slater, & Goldberg, 2018), while the desire to have children is influenced by biological, psychological and social needs (Patel et al., 2016).

Biological needs

Biologically, children serve as continuation of genetic material (Liamputtong & Benza, 2018) – in this regard, research strongly suggests a biological predisposition to positive attitudes towards reproducing and parental attachment (Chasiotis, Hofer, & Campos, 2007; Miller, 2011).

Psychological needs

Parenthood provides meaning, happiness and fulfilment (Dyer, Mokoena, Maritz & van der Spuy, 2008; Hansen, 2012). This is because Erikson's psychosocial theory of development emphasises parenthood as an important developmental milestone (Hansen, 2012) during which parents' emotional needs in terms of being able to give and receive love are addressed (McAllister, Pepper, Virgo, & Coall, 2016). Parenthood is also strongly related to identity, specifically for women, as the need to have a child specifically relates to the

prospect of the associated identity development of being a mother (Dyer, et al., 2008; van Balen & Trimbos-Kemper, 1995).

Social needs

Social motives for parenthood include social control (van Balen & Trimbos-Kemper, 1995) and continuity, for example, of the family name (McAllister et al., 2016). However, the desire for and importance of reproduction differs across societies (Dyer et al., 2008). In Western societies the decision to have a child is deemed a personal choice that is related to creating a sense of happiness and personal fulfilment and is less influenced by societal expectations (Dyer, 2007). However, in non-Western societies a woman's decision to have a child is influenced by various socio-cultural norms and expectations (Liamputtong & Benza, 2018). For example, in African societies, children are often viewed as a valuable resource in terms of monetary value, social status and the continuity of the family and society (Dyer, 2007; Chimbatata & Malimba, 2016). In addition, the importance of parenthood in African societies seems to be higher than in other societies (Inhorn & Patrizio, 2015).

Infertility

Infertility has become more prominent in recent years, with approximately 48.5 million couples worldwide being affected in 2010 (Mascarenhas, Flaxman, Boerma, Vanderpoel, & Stevens, 2012). The attitudes towards infertility in developed and developing countries tend to vary (Hardeep et al. 2009). Whereas infertility in developed countries has received growing attention and understanding, in developing countries it is still a marginalised issue in sexual and reproductive health (Polis, Cox, Tunçalp, McLain & Thoma, 2017). In Africa in particular, infertility is a concern due to the social stigma associated with it (Alhassan, Ziblim & Muntaka, 2014; Fledderjohann, 2012). Women who are affected tend to show elevated levels of distress compared to their male partners and higher psychological distress in comparison to women who can conceive (Hardeep et al. 2009).

Definition of infertility

The definition of infertility can be considered from two perspectives, mainly a clinical and demographic perspective (Gurunath, Pandian, Anderson, & Bhattacharya, 2011). The World Health Organisation (2016) defines infertility as “a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse” (p. 1). Alternatively, demographers describe infertility as a woman failing to have a live birth despite engaging in sexual activity, without any form of contraception (Larsen, 2005). The clinical duration is viewed as 12 to 24 months, whereas demographers use a five-year time frame. The term infertility is also used interchangeably with words such as childlessness, subfertility, subfecundity, primary permanent infertility, primary unresolved infertility and unresolved infertility (Gurunath et al., 2011). As a result of such varying definitions, the prevalence of infertility may be difficult to establish (Gurunath et al., 2011).

Infertility types

Infertility can be classified as either primary or secondary, and further subdivided into subfertility, combined infertility or unexplained infertility. Primary infertility refers to the inability to fall pregnant or conceive after 12 months of unprotected sexual intercourse, whereas secondary infertility refers to current infertility difficulties despite previously experiencing one or more successful pregnancies (American Society for Reproductive Medicine, 2016). Subfertility is a broad term that refers to any fertility issues that may affect and prolong the inability to conceive, but where natural conception is still viable (Gnoth et al., 2005; Poddar, Sanyal, & Mukherjee, 2014). Alternatively, combined infertility refers to when a couple is unable to conceive due to both partners being infertile or subfertile (Poddar et al., 2014). Lastly, unexplained infertility, which is rarer and is deemed a diagnosis of

exclusion, occurs when medical investigations indicate no sexual reproductive abnormalities, yet conception fails to occur without assistance (Poddar et al., 2014; Anderson, 2018).

Prevalence of infertility

Approximately 186 million individuals experience infertility globally (Inhorn & Patrizio, 2015). It is estimated that in developed countries one in every seven couples will experience infertility compared to one in every four couples in developing countries (Vander Borgh & Wyns, 2018). According to a study conducted by Mascarenhas et al. (2013), the rates of infertility were highest in South Asia, Central Asia, sub-Saharan Africa, North Africa, the Middle East, Central and Eastern Europe. In 2016, the rate of infertility in South and Central Asia, sub-Saharan Africa, North Africa, the Middle East, Central and Eastern Europe were reaching up to 30% (Sonaliya, 2016). Specifically, in sub-Saharan regions of Africa, the prevalence of infertility ranges from 21.2% in north-western Ethiopia, 20 to 30% in Nigeria, 9% in Gambia, and 11.8% among women and 15.8% among men in Ghana (Asemota & Klatsky, 2015; Hollos & Whitehouse, 2014; Parrott, 2014; Tabong & Adongo, 2013). In Kenya, infertility is a common reason for gynaecological visits, a state of affairs that was also apparent in Libreville, Gabon, where 45% of patients were seen due to the aforementioned reason (Moungala, Boyd, & Huyser, 2019; Murage, Murwa, Muteshi, & Githae, 2011). The most common form of infertility in women is secondary infertility (Vander Borgh & Wyns, 2018). Although rates of both primary and secondary infertility have decreased in Africa, secondary infertility is still a common occurrence in sub-Saharan Africa, with more than 10% of women being affected (Inhorn & Patrizio, 2015). The topic of infertility in developing countries tends to be overlooked despite the impact being substantial (Polis et al., 2017).

Causes of infertility

There are multiple causal factors of infertility that are physiological, endocrinological, biogenic, environmental and life-style related (Poddar et al., 2014; Syamala, 2012).

According to Anwar and Anwar (2016), the responsibility for the causes of infertility is shared between both sexes. The causes of infertility in women can be classified into three main groups, which are dependent on whether defective ovulation, transport or implantation are root causes (CDC, 2019). One of the most common causes of female-related infertility is tubal factor infertility (TFI), which is highly prevalent in developing countries, with the most commonly occurring accounts being in the regions of sub-Saharan Africa (Asemota & Klatsky, 2015; Inhorn & Patrizio, 2015; Tsevat, Wiesenfeld, Parks, & Peipert, 2017). TFI is often the result of infections, specifically sexually transmitted diseases (STDs) such as chlamydia and gonorrhoea (Tsevat et al., 2017). The aforementioned STDs also result in pelvic inflammatory disease (PID) in women, with the consequence of infertility (Syamala, 2012). Approximately 40 percent of women with untreated chlamydia will develop PID and 20 percent of those will experience infertility as a result of tubal scarring (Syamala, 2012). These infections are often the cause of secondary infertility, in addition to unsafe abortion practices, which are the most preventable (Inhorn & Patrizio, 2015; Vander Borghet & Wyns, 2018). The limited access to reproductive health care in Africa could increase the vulnerability to infertility as well as the rate of HIV (Asemota & Klatsky, 2015; Cousineau & Domar, 2007; Huyser & Boyd, 2013).

Genetic abnormalities, hormone imbalances and environmental conditions are considered to be further influential factors in infertility in women (Hanson et al., 2017). In women, endometriosis, endometrial polyps, polycystic ovarian syndrome, tubal blockage, premature ovarian insufficiency, and uterine fibroids are some of the physiological causes (Vander Borghet & Wyns, 2018). Physical environmental factors, exposure to certain

chemicals, metals and pesticides, as well as the level of physical activity, diet and weight can have a negative effect on rates of fertility (Syamala, 2012; Hart, 2016). Furthermore, the advancing age at which women are conceiving due to educational and career pursuits also increases the prospects of infertility difficulties (Eijkemans et al., 2014; Syamala, 2012). Poddar et al. (2014) note that psychological causes of infertility have only become significant to health practitioners in the last 30 years. Research in this regard is scarce and inconsistent; however, it seems that women with mental illnesses, specifically those diagnosed with depression, have an increased risk for infertility (Schweiger, Schweiger, & Schweiger, 2018).

The impact of infertility

The onus of infertility is often placed on the woman (Mascarenhas et al., 2012; Amakwe, 2013). In addition, the impact of infertility is more severe in developing countries due to the emphasis and value placed on children in these contexts, whereas in developed countries having children is often seen as a personal decision (Syamala, 2012).

Psychological impact. The psychological effects of infertility are similar to those of a serious chronic disease and can present as a psychological burden (Podolska & Bidzan, 2011). Although males and females usually have similar rates of infertility, women are more adversely affected and tend to experience more negative emotions than men (Edelmann & Connolly, 2000; Inhorn & Patrizio, 2015; Lee & Sun, 2000). Motherhood can in some cultures be the only manner in which a woman may advance her status within the family and community (Cousineau & Domar, 2007). A woman's sense of identity and femininity becomes challenged and this can result in feelings of inadequacy and incompleteness (Rouchou, 2013). A study conducted in South Africa highlighted the psychological distress and impact on well-being experienced by infertile women (Pedro & Andipatin, 2014). In another South African study, Dyer, Abrahams, Mokoena, Lombard, and van der Spuy (2005)

concluded that infertile women were prone to higher levels of distress in comparison to women who were fertile.

As a result, a range of emotions are experienced, including denial, anger, loneliness, powerlessness, worthlessness shame, guilt, low self-esteem, sadness, and desperation (Pedro & Andipatin, 2014; Rouchou, 2013; Vitale, La Rosa, Rapisarada, & Laganá, 2017). It is therefore not surprising that the presence of mental illness, specifically depressive and anxiety disorders, becomes more frequent in women with infertility (Cousineau & Domar, 2007; Hardeep et al., 2009; Rouchou, 2013, Sultan & Tahir, 2011). Many studies have indicated that depression in infertile women was twice as likely and of a higher severity compared to fertile women (Cwikel, Gidron, & Sheiner, 2004). A change in sexual function may occur, with women who have secondary infertility experiencing higher dysfunction in terms of decreased libido, frequency of engagement in sexual intercourse, and poorer sexual satisfaction (Keskin et al., 2011; Nikoubakht, Karimi, & Bahrami, 2011). They are also at an increased risk of being overweight and obese (Esmailzadeh, Delavar, Basirat, & Shafi, 2013).

High rates of anxiety can further compromise conception rates (Matsubayashi, Hosaka, Izumi, Suzuki, & Makino, 2001), and subsequently affect the quality of the relationship between partners through increased interpersonal distress (Podolska & Bidzan, 2011). This may have an impact on one's sense of identity and value as a couple (Poddar et al., 2014). Conflict and sexual dysfunction may ensue to such an extent that in some cultures divorce may result, further lowering a woman's self-esteem (Omu & Omu 2010; Rouchou, 2013). Unfortunately, this may also result in increased vulnerability to gender-based violence, particularly in developing countries (McCloskey, Wereiams & Larsen, 2005; Rouchou, 2013). A study conducted by Syamala (2012) in India revealed that childless women are exposed to more physical violence than fertile women and the consequences for their health

are greater. Infertile women are often blamed as the cause of infertility, even though in approximately 40% of cases both men and women are responsible (NICE, 2013).

Social impact. Research suggests that women are predominantly the ones who are affected socially by infertility (Hammarberg & Kirkman, 2013; Ramamurthi, Kavitha, Pounraj, & Rajarajeswari, 2016), especially in pronatalist countries such as South Africa where a women's value is reflected in her ability to reproduce (Pedro & Andipatin, 2014). Jamilian, Jamilian, and Soltany (2017) found that infertile women receive less support from society, family and friends in comparison to fertile women. Culture, age, race, and class division do not seem to mediate the impact of infertility (Rouchou, 2013); therefore, it is no surprise that worldwide, infertility not only results in distress, but also in discrimination and ostracism (Cousineau & Domar, 2007; Mascarenhas et al., 2013). Stigmatisation and discrimination are often associated with a loss of social status and dignity within all social spheres (Hammarberg & Kirkman, 2013; Hasanpoor-Azghdy & Simbar, 2015).

Within certain communities, infertile women are often stigmatised in the form of name-calling or being excluded from cultural rituals or the use of certain apparel (Rouchou, 2013). Although family support is apparent, such women are still exposed to cultural expectations, social pressure and humiliation from family members (Hasanpoor-Azghdy & Simbar, 2015; Rouchou, 2013). They tend to feel that their needs for support are unmet (High & Steuber, 2014), and as a result of this lack of social acceptance, they experience frustration, guilt and anxiety (Podolska & Mariola, 2011).

It appears therefore that infertility has numerous consequences, especially for women in developing countries, with the condition predominantly resulting in stigmatisation, isolation, and even neglect from the family and larger community, which can further contribute to the occurrence of psychological abuse (Hammarberg & Kirkman, 2013).

Financial impact. Children are viewed as a source of economic value and survival in developing countries where social security measures may be absent (Daar & Merali, 2002; Syamala, 2012). The economic consequences of childlessness are often under-researched (Rouchou, 2013). Infecundity, especially in lower income families, may exacerbate poverty due to the loss of perceived child labour, as well as the reduction or removal of financial benefits that may be received in the forms of gifts and inheritances that depend on cultural expectations of conceiving children (Daar & Merali, 2002; Rouchou, 2013). Dyer and Patel (2012) found that men from Cameroon, Nigeria, Botswana, Gambia, Rwanda, and Mozambique tend to divorce their wives due to infertility, consequently reducing financial support. The quality and services provided by health care systems in developing countries is usually limited, further adding to the financial burden in terms of the cost of fertility treatments (Dyer & Patel, 2012).

Coping with infertility. There are a variety of theories aimed at defining and understanding coping (Carroll, 2013). Coping is defined as “constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman 1984, p. 141). Tobin, Holroyd, Reynolds, and Wigal (1989) conceptualised coping styles into a hierarchy, consisting of two factors, one of which is when an individual actively engages the problem and the other when the person avoids the problem. These two factors are further divided into specific coping styles. Other types of coping strategies focus on the adaptation of a person’s worldview, known as personal transformation (Wong & Wong, 2006). In this regard, Benyamini, Gozlan, and Kokia (2004) indicated that cognitive representations of infertility tended to influence the type of coping strategies used. Coping is also considered to be an aspect of emotional regulation, which refers to the internal and external processes of

monitoring, evaluating, and modifying one's emotional reaction to accomplish a goal (Berking & Wupperman, 2012).

Types of coping strategies. In a stressful situation an individual has an array of coping strategies available to them, which can be simplified into basic coping dimensions (Parker & Endler, 1996). Coping theorists divide coping into three main categories, namely emotion-focused and problem-focused coping (Lazarus & Folkman, 1984), as well as avoidance-oriented coping (Parker & Endler, 1996). Various researchers have recognised that women with infertility may use different coping strategies to regulate their emotions (Benyamini et al., 2004; Panagopoulou, Vedhara, Gaintarzi, & Tarlatzis, 2006; Sormunen, Aanesen, Fossum, Karlgren, & Westerbotn, 2018). Emotion-focused coping refers to diminishing the emotional distress caused by a stressful event by consciously engaging in activities that aim at regulating affect (Lazarus, & Folkman, 1984). Problem-focused coping, in contrast, involves strategies that remove or reduce the effects of the stressor (Parker & Endler, 1992). Finally, avoidance-oriented coping comprises of two aspects, namely person-oriented and task-oriented strategies (Parker & Endler, 1996). This refers to any form of cognitive and behavioural strategy aimed at denying or reducing the stressor, such as engaging socially with others or in a distractive task (Cronkite & Moos, 1995; Penley, Tomaka, & Wiebe, 2002). Further developments in coping theory led to the consideration of situational factors as determinants of the type of coping response, which involves the cognitive appraisal of the stressful event and the coping resources available (Lazarus & Folkman, 1984).

When attempting to identify the type of coping strategy used, an interindividual or intraindividual approach can be used (Cox & Ferguson, 1991). A study by Podolska and Bizan (2011) found that women who suffer from infecundity use escape or avoidance strategies. For example, women often isolate themselves socially to avoid stigmatisation, by

avoiding either social events like family gatherings or social interactions with pregnant women or children (Hasanppor-Azghdy & Simbar, 2015).

The use of coping strategies such as avoidance, denial and self-blame has been associated with higher levels of distress in comparison to approach and active coping strategies in women with infertility (Kraaij, Garnefski & Schroevers, 2009). The coping strategies used by women and men tend to differ (Pedro, 2015).

Infertility treatment options

Medical infertility treatment. There are various infertility treatment options (Anwar & Anwar, 2016; Tanywe, Matchawe, Fernandez, & Lapkin, 2018). Tanywe et al. (2018) divide these options into three main groups, namely surgery, chemotherapy-related treatment and assistive reproductive treatment (ART). In terms of ART, in vitro fertilisation (IVF) is one of the most frequently used infertility treatments, especially in developed countries, but remains expensive and unattainable in developing areas, specifically in Africa (Tanywe et al., 2018; Sonaliya, 2016). According to Collins (as cited in Hammarberg & Kirkman, 2013), in low-income countries the cost of one IVF cycle is equivalent to less than half of an individual's average yearly income. IVF treatment in America ranges up to \$20 000, while in India it starts from \$2 000 (Sonaliya, 2016), and in South Africa it can cost R50 000 (BioArt, 2019). A South African study was conducted by Dyer, Sherwood, Ataguba, and McIntyre (2013) where ART was subsidised, and a couple was expected to pay a portion of the treatment. It was found that half of the couples had to obtain additional work even though they had reduced household expenses in an attempt to cover treatment costs (Dyer et al., 2013). A shortfall of IVF is that there is no guaranteed success and the number of attempts needed varies per individual (Sonaliya, 2016). An additional option is surrogacy or the use of a gestational carrier, which is also costly, with prices varying from \$15 000 in America to £7 000 in the United Kingdom (Sonaliya, 2016).

A further implication of the various medical infertility treatments is their side-effects, which range from ovarian hyper-stimulation syndrome, ectopic pregnancies and the risk of multiple births (Sonaliya, 2016). The stress associated with undergoing infertility treatment can also impact on an individual's psychological well-being (Vitale et al., 2017). A study by Maroufizadeh, Karimi, Vesali, and Samani (2015) indicated higher rates of depression and anxiety in patients following the failure of infertility treatment. A study in which women underwent ART treatment found that women tend to experience heightened levels of anxiety and depression in comparison to their partners (Reis, Xavier, Coelho, & Montenegro, 2013). The limited success of such procedures can heighten distress and compromise the quality of a couple's relationship (Vitale et al., 2017). ART is a common type of treatment required in developing countries due to the high rate of tubal blockages (Ombelet & Goossens, 2017).

Although a variety of assisted reproductive treatment options exist (Rouchou, 2013), these options are often expensive and time consuming, and are often not readily available in developing countries (Asemota & Klatsky, 2015; Rouchou, 2013). For most women these treatments result in anxiety, fear, and depression (Podolska & Bidzan, 2011). Thus, although there are numerous medical interventions available to treat infertility, the psychological impact of such a stressor is also important to address, and infertile couples should be provided with options for psychological treatment (Podolska & Bidzan, 2011).

Psychological treatment. Luk and Loke (2016) found in a systematic review that the psychosocial interventions of cognitive behavioural therapy (CBT), acceptance and commitment therapy (ACT) and body-mind-spirit (BMS) therapy decreased infertility-related stress in females. Therapeutic counselling in general was found to be effective in decreasing distress such as depression and anxiety in women with infertility (Kharde, Pattad, & Bhogale, 2012). Further findings suggest that mindfulness-based interventions may also be useful for women experiencing infertility (Galhardo, Cunha, & Pinto-Gouveia, 2013). Growth may be

experienced by women with infertility when assistance is given in developing positive coping strategies (Yu et al., 2014). Cousineau and Domar (2007) found that psychological interventions that incorporate both stress management and coping skills have been helpful for infertile patients. Therefore, incorporating coping strategies into psychological treatment of women affected by infertility may be of value.

Conclusion

It is evident from the literature in general that infertility, whether primary or secondary, is a stressful event that may have important psychological, social and financial consequences. In response, women with infertility may use a variety of coping strategies. As infertility services are not widely available in developing countries, the need to understand coping as a way to assist women with infertility becomes even more prominent. Women's experience of infertility, especially in an African context, can be deemed to be more than just a clinical issue (Tanywe et al., 2018). Developing a synthesis of coping in this regard will assist mental health care providers with the development of psychological intervention plans, as well as catering them to women with a specific type of infertility.

References

- Alhassan, A., Ziblim, A. R., & Muntaka, S. (2014). A survey on depression among infertile women in Ghana. *BMC Women's Health, 14*(42), 1–6. doi: 10.1186/1472-6874-14-42
- Amakwe, B. E. (2013). The problem with infertility. *Human Life Review, 3*(2). Retrieved from <https://www.questia.com/magazine/1P3-3055387411/the-problem-of-infertility-in-africa>
- American Society for Reproductive Medicine. (2016). Infertility. Retrieved from <https://www.asrm.org/?vs=1>
- Anderson, K. A. (2018). An integrative approach to diagnosing and treating unexplained infertility. *Journal of Chinese Medicine, 118*, 49–57. Retrieved from <https://eds-b-ebsochost-com.nwulib.nwu.ac.za/eds/pdfviewer/pdfviewer?vid=7&sid=f478cb12-71f7-4204-8ad4-4085d5a69bfc%40sessionmgr103>
- Anwar, S., & Anwar, A. (2016). Infertility: A review on causes, treatment and management. *Women's Health & Gynecology, 2*(6), 1–5. Retrieved from <https://scientonline.org/open-access/infertility-a-review-on-causes-treatment-and-management.pdf>
- Asemota, O. A., & Klatsky, P. (2015). Access to infertility care in the developing world: The family promotion gap. *Seminars in Reproductive Medicine, 33*(1), 17–22. doi: 10.1055/s-0034-1395274
- Benyamini, Y., Gozlan, M., & Kokia, E. (2004). On the self-regulation of a health threat: cognitions, coping, and emotions among women undergoing treatment for infertility. *Cognitive Therapy and Research, 28*(5), 577–592. doi: 10.1023/B:COTR.0000045566.97966.2

- Berking, M., & Wupperman, P. (2012). Emotion regulation and mental health: recent findings, current challenges, and future directions. *Current opinion in Psychiatry*, 25(2), 128–134. doi: 10.1097/YCO.0b013e3283503669
- BioArt – Fertility Clinic. (2019). *Fertility treatment costs*. Retrieved from <https://bioartfertility.co.za/fertility-treatment-costs/>
- Carroll, L. (2013). Active coping. In M. D., Gellman & J. R. Turner (Ed.), *Encyclopaedia of behavioural medicine* (p. 21). New York, NY: Springer.
- CDC - Centers for Disease Control and Prevention. (2019). *Reproductive health – Infertility*. Retrieved from <https://www.cdc.gov/reproductivehealth/infertility/index.htm>
- Chasiotis, A., Hofer, J., & Campos, D. (2007). When does liking children lead to parenthood? Younger siblings, implicit prosocial power motivation, and explicit love for children predict parenthood across cultures. *Journal of Cultural and Evolutionary Psychology*, 4(2), 95–123. doi: 10.1556/JCEP.4.2006
- Chimbatata, N. B. W., & Malimba, C. (2016). Infertility in sub-saharan Africa: A woman's issue for how long? A qualitative review of literature. *Open Journal of Social Sciences*, 4(1), 96–102. doi: 10.4236/jss.2016.48012
- Cousineau, T. M., & Domar, A. D. (2007). Psychological impact of infertility. *Best Practice & Research Clinical Obstetrics & Gynaecology* 21(2), 293–308. doi: 10.1016/j.bpobgyn.2006.12.003
- Cox, T., & Ferguson, E. (1991). Individual differences, stress and coping. In C. L. Cooper, & R. Payne (Eds.), *Personality and stress: Individual differences in the stress process* (pp. 7–30). Chichester, UK: Wiley.
- Cronkite, R. C., & Moos, R. H. Life context, coping processes, and depression. In E. E. Beckham, & W. R. Leber (Eds.), *Handbook of depression* (pp. 569–587). New York: Guilford Press.

- Cwikel, J., Gidron, Y., & Sheiner, E. (2004). Psychological interactions with infertility among women. *European Journal of Obstetrics and Gynecology*, *117*(2), 126–131. doi: 10.1016/j.ejogrb.2004.05.004
- Daar, A. S., & Merali, Z. (2002). Infertility and social suffering: the case of ART in developing countries. In E. Vayena, J. R. Rowe, & P. D. Griffin (Eds.), *Current practices and controversies in assisted reproduction: Medical, ethical and social aspects of assisted reproduction organised by World Health Organisation, Geneva, Switzerland* (pp. 15–21). Switzerland: WHO Publications.
- Dyer, S. J., Abrahams, N., Mokoena, N. E., Lombard, C. J., & van der Spuy, Z. M. (2005). Psychological distress among women suffering from infertility in South Africa: a quantitative assessment. *Human Reproduction*, *20*(7), 1938–1943. doi: 10.1093/humrep/deh845
- Dyer, S. J. (2007). The value of children in African countries – insights from studies on infertility. *Journal of Psychosomatic Obstetrics and Gynaecology*, *28*(2), 69–77. doi: 10.1080/01674820701409959
- Dyer, S., Mokoena, N., Maritz, J., & van der Spuy, Z. (2008). Motives for parenthood among couples attending a level 3 infertility clinic in the public health sector in South Africa. *Human Reproduction*, *23*(2), 352–357. doi: 10.1093/humrep/dem279
- Dyer, S. J., & Patel, M. (2012). The economic impact of infertility on women in developing countries – a systematic review. *Facts, Views & Vision in Obstetrics & Gynecology*, *4*(2), 102–109. Retrieved from <https://www.researchgate.net/publication/261772807>
- Dyer S. J., Sherwood, K., McIntyre, D., & Ataguba, J. E. (2013). Catastrophic payment for assisted reproduction techniques with conventional ovarian stimulation in the public health sector of South Africa: frequency and coping strategies. *Human Reproduction*, *28*(1), 2755–2764. doi: 10.1093/humrep/det290

- Edelmann, R., & Connolly, K. J. (2000). Gender differences in response to infertility and infertility investigations: Real or illusory. *British Journal of Health Psychology*, *5*(4), 365–375. doi: 10.1348/135910700168982
- Eijkemans, M. J. C., van Poppel, F., Habbema, D. K., Smith, K. R., Leridon, H., & Velde, E. R. (2014). Too old to have children? Lessons from natural fertility populations. *Human Reproduction*, *29*(6), 1304–1312. doi: 10.1093/humrep/deu056
- Esmailzadeh, S., Delavar, M. A., Basirat, Z., & Shafi, H. (2013). Physical activity and body mass index among women who have experienced infertility. *Archives of Medical Science*, *9*(3), 499–505. doi:10.5114/aoms.2013.35342
- Fledderjohann, J. J. (2012). ‘Zero is not good for me’: implications of infertility in Ghana. *Human Reproduction*, *27*(5), 1383–1390. doi:10.1093/humrep/des035
- Galhardo, A., Cunha, M., & Pinto-Gouveia, J. (2013). Mindfulness-based program for Infertility: efficacy study. *Infertility and Sterility* *100*(4), 1059–1067. doi: 10.1016/j.fertnstert.2013.05.036
- Gnoth, E., Godehardt, E., Frank-Herrmann, P. F., Friol, K., Jürgen, T., & Freundl, G. (2005). Definition and prevalence of subfertility and infertility. *Human reproduction*, *20*(5), 1144–1147. doi: 10.1093/humrep/deh870
- Gurunath, S., Pandian, Z., Anderson, R. A., & Bhattacharya, B. (2011). Defining infertility – a systematic review of prevalence studies. *Human Reproduction Update*, *17*(5), 575–588. doi: 10.1093/humupd/dmr015
- Hansen, T. (2012). Parenthood and happiness: a review of folk theories versus empirical evidence. *Social Indicators Research*, *108*(1), 29–64. doi: 10.1007/s11205-011-9865-y
- Hanson, B., Johnstone, E., Dorais, J., Silver, B., Peterson, C. M., & Hotaling, J. (2017). Female infertility, infertility-associated diagnoses and comorbidities: a review. *Journal*

of Assisted Reproduction and Genetics, 34(2), 167–177. doi 10.1007/s10815-016-0836-

8

Hammarberg, K., & Kirkman, M. (2013). Infertility in resource-constrained settings: moving towards amelioration. *Reproductive BioMedicine Online*, 26(2), 189–195. doi: 10.1016/j.rbmo.2012.11.009

Hardeep, L. J., Rohtash, S., & Rohtash, B. (2009). Psychological distress, coping and subjective wellbeing among infertile women. *Journal of the Indian Academy of Applied Psychology*, 35(2), 329–336. Retrieved from <http://medind.nic.in/jak/t09/i2/jakt09i2p329.pdf>

Hart, R. J. (2016). Physical aspects of female fertility: role of the environment, modern lifestyle, and genetics. *Physiological Reviews*, 96(3), 873–909. doi: 10.1152/physrev.00023.2015

Hasanpoor-Azghydy, S. B., & Simbar, M. (2015). The social consequences of infertility among Iranian women: A qualitative study. *International journal of fertility sterility*, 8(4), 409–240: doi: 10.22074/ijfs.2015.4181

High, A., & Steuber, K. R. (2014). Support gaps of type and source of support: an examination of the support perceptions of infertile women. *Communication Monographs*, 81(2), 157–178. doi: 10.1080/03637751.2013.878868

Hollos, M., & Whitehouse, B. (2014). Women in Limbo: Life course consequences of infertility in a Nigerian community. *Human Fertility*, 17(3), 188–191. doi: 10.3109/14647273.2014.936052

Huyser, C., & Boyd, L. (2013). ART in South Africa: The price to pay. *Facts, views & Vision in ObGyn*, 5(2), 91–99. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3987358/>

- Inhorn, M. C. & Patrizio, P. (2015). Infertility around the globe: new thinking on gender, reproductive technologies and global movements in the 21st century. *Human Reproduction Update*, 21(4), 411–426. doi: 10.1093/humupd/dmv016
- Jamilian, H., Jamilian, M., & Soltany, S. (2017). The comparison of quality of life and social support among fertile and infertile women. *Patient safety & quality improvement journal*, 5(2), 521–525. Retrieved from <https://pdfs.semanticscholar.org/ec2b/071f447662114d7550bb38c947fd8f896ad.pdf>
- Keskin, U., Coksuer, H., Gungor, S., Ercan, C. M., Karasahin, K. E., & Baser, I. (2011). Differences in prevalence of sexual dysfunction between primary and secondary infertile women. *Fertility and Sterility*, 96(5), 1213–1217. doi: 10.1016/j.fertnstert.2011.08.007
- Kharde, S. N., Pattad, S., & Bhogale, G. S. (2012). Effectiveness of a therapeutic counseling intervention for depression, anxiety, self-esteem and marital adjustment among infertile women. *International Journal of Nursing Education*, 4(2), 151–154. Retrieved from sciedu.ca/journal/index.php/jnep/article/download/6122/4088
- Kraaij, V., Garnefski, N., & Schroevers, M. J. (2009). Coping, goal adjustment, and positive and negative affect in definitive infertility. *Journal of health psychology*, 14(8), 18–25. doi: 10.1177/1359105308097939
- Larsen, U. (2005). Research on infertility: which definition should we use? *Fertility and Sterility*, 83(1), 846–852. doi: 10.1016/j.fertnstert.2004.11.033
- Lazarus, R. S., & Folkman, S. (1984). The coping process: An alternative to traditional formulations. *Stress, Appraisal, and Coping* (pp. 141–178). New York, NY: Springer.
- Lee, T. Y., & Sun, G. H. (2000). Psychosocial response of Chinese infertile husbands and wives. *Archives of Andrology*, 45(3), 143–148. doi: 10.1080/01485010050193913

- Liamputtong, P., & Benza, S. (2018). 'Being able to bear a child': Insights from Zimbabwean women in Melbourne. *Women and Birth*, 32(2), 216–222. doi: 10.1016/j.wombi.2018.07.002
- Luk, B. H., & Loke, A. Y. (2016). A review of supportive interventions targeting individuals or couples undergoing infertility treatment: Directions for the development of interventions. *Journal of Sex & Marital Therapy*, 42(6), 515–533. doi: 10.1080/0092623X.2015.1074133
- Maroufizadeh, S., Karimi, E., Vesali, S., & Samani, O. R. (2015). Anxiety and depression after failure of assisted reproductive treatment among patients experiencing infertility. *International Journal of Gynaecology and Obstetrics* 130(3), 253–256. doi: 10.1016/j.ijgo.2015.03.044
- Mascarenhas, M. N., Flaxman, S. R., Boerma, T., Vanderpoel, S., & Stevens, A. S. (2012). National, regional, and global trends in infertility prevalence since 1990: A systematic analysis of 277 Health Surveys. *PLoS Medicine*, 9(12), 1–12. doi: 10.1371/journal.pmed.1001356
- Matsubayashi, H., Hosaka, T., Izumi, S. I., Suzuki, T., & Makino, T. (2001). Emotional distress of infertile women in Japan. *Human Reproduction*, 16(5), 966–969. doi: 10.1093/humrep/16.5.966
- McAllister, L. S., Pepper, G. V., Virgo, S., & Coall, D. A. (2016). The evolved psychological mechanisms of fertility motivation: hunting for causation in a sea of correlation. *Philosophical Transactions of the Royal Society Biological Sciences*, 371(1692), 1–16, doi: 10.1098/rstb.2015.0151
- McCloskey, L. A., Wereiams, C., & Larsen, U. (2005). Gender Inequality and Intimate Partner Violence among Women in Moshi, Tanzania. *International Family Planning Perspective*, 31(3), 124–130. doi: 10.1363/ifpp.31.124.05

- Miller, W. B. (2011). Differences between fertility desires and intentions: implications for theory, research and policy. *Vienna Yearbook of Population Research*, 9(1), 75–98. doi: 10.1553/populationyearbook2011s75
- Moungala, L. W., Boyd, L. S., & Huyser, C. (2019). Infertility in Gabon: a survey to determine diagnostic and medical support to patients. *African Journal of Reproductive Health*, 22(4), 111–116. doi: 10.29063/ajrh2019/v23i1.11
- Murage, A., Murwa, C., Muteshi, M. B., & Githae, F. (2011). Assisted reproduction services provision in a developing country: time to act? *Fertility and Sterility*, 96(4), 966–968. doi: 10.1016/j.fertnstert.2011.07.1109
- NICE. (2013). *Fertility, assessment and treatment for people with infertility problems*. London: National Institute for Health and Care Excellence. Retrieved from <https://www.nice.org.uk/guidance/cg156>
- Nikoubakht, N., Karimi, U., & Bahrami, H. (2011). Couple burnout among fertilized and unfertilized women referred to Valieasr Reproductive Centre. *Iranian Journal of Epidemiology*, 7(1), 32–37. Retrieved from http://irje.tums.ac.ir/browse.php?a_id=59&sid=1&slc_lang=en
- Panagopoulou, E., Vedhara, K., Gaintarzi, C., & Tarlatzis, B. (2006). Emotionally expressive coping reduces pregnancy rates in patients undergoing in vitro fertilization. *Fertility and Sterility*, 86(3), 672–677. doi: 10.1016/j.fertnstert.2006.02.096
- Parker, J. D. A., & Endler, N. S. (1992). Coping with coping assessment: A critical review. *European Journal of Psychology*, 6(5), 321–344. doi: 10.1002/per.2410060502
- Parker, J. D. A., & Endler, N. S. (1996). Coping and defense: A historical overview. In M. Zeidner & N. S. Endler (Eds.), *Handbook of coping: Theory, research and application* (pp. 3–23). Canada: Wiley & Sons.

- Parrott, F. R. (2014). At the hospital I learnt the truth: Diagnosing male infertility in rural Malawi. *Anthropology & Medicine*, 21(2), 174–188. Retrieved from <https://eds-a-ebscohost-com.nwulib.nwu.ac.za/eds/pdfviewer/pdfviewer?vid=5&sid=c959bc57-8b60-4097-ac5e-20b38ed51557%40sdc-v-sessmgr01>
- Patel, A., Sharma, P. S., Narayan, P., Binu, V. S., Dinesh, N., & Pai, P. J. (2016). Prevalence and predictors of infertility-specific stress in women diagnosed with primary infertility: A clinic-based study. *Journal of Human Reproductive Sciences*, 9(1), 28–34. doi: 10.4103/0974-1208.178630
- Pedro, A. (2015). Coping with infertility: An explorative study of South African women's experiences. *Open Journal of Obstetrics and Gynecology*, 59(1), 49–59. doi: 10.4236/oog.2015.1008
- Pedro, A., & Andipatin, M. (2014). A qualitative exploration of South African women's psychological and emotional experiences of infertility. *Journal of Preventive Medicine*, 4(1), 327–337. doi: 10.4236/ojpm.2014.45040
- Penley, J. A., Tomaka, J., & Wiebe, J. S. (2002). The association of coping to physical and psychological health outcomes: A meta-analytic review. *Journal of Behavioral Medicine*, 25(6), 551–603. doi: 10.1023/A:1020641400589
- Poddar, S., Sanyal, N., & Mukherjee, U. (2014). Psychological profile of women with infertility: A comparative study. *Industrial Psychiatry Journal*, 23(2), 117–126. doi: 10.4103/0972-6748.151682
- Podolska, M. Z., & Bidzan, M. (2011). Infertility as a psychological problem. *Ginekologia Polska*, 82(1), 44–49. doi: 10.04.2010
- Polis, C. B., Cox, C. M., Tunçalp, O., McLain, A. C., & Thoma, M. E. (2017). Estimating infertility prevalence in low-to-middle-income countries: an application of a current

- duration approach to Demographic and Health Survey data. *Human Reproduction*, 32(5), 1064–1074. doi: 10.1093/humrep/dex025
- Ombelet, W., & Goossens, J. (2017). Global reproductive health – Why do we persist in neglecting the undeniable problem of childlessness in resource-poor countries. *Facts, Views and Vision in ObGyn*, 9(1), 1–3. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5506764/>
- Omu, F. E., & Omu, A. E. (2010). Emotional reaction to diagnosis of infertility in Kuwait and successful clients' perception of nurses' role during treatment. *BMC Nursing*, 9(5). doi: 10.1186/1472-6955-9-5
- Ramamurthi, R., Kavitha, G., Pounraj, D., Rajarajeswari, S. (2016). Psychological impact and coping strategies among women infertility – A hospital based cross sectional study. *IAIM*, 3(2), 114–118. doi: http://iaimjournal.com/wp-content/uploads/2016/02/iaim2016_0302_17.pdf
- Reis, S., Xavier, M. X., Coelho, R., & Montenegro, N. (2013). Psychological impact of single and multiple courses of assisted reproductive treatments in couples: a comparative study. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 171(1) 61–66. doi: 10.1016/j.ejogrb.2013.07.034
- Rouchou, B. (2013). Consequences of infertility in developing countries. *Perspectives in Public Health*, 133(3), 174–178. doi: 10.1177/1757913912472415
- Saxbe, D., Rossin-Slater, M., & Goldenberg, D. (2018). The transition to parenthood as a critical window for adult health. *American Psychologist*, 73(9), 1990–2000. doi: 10.1037/amp0000376
- Schweiger, U., Schweiger, J. U., & Schweiger, J. I. (2018). Mental disorders and infertility. *Archives of Psychology*, 2(6), 1–14. Retrieved from <https://archivesofpsychology.org/index.php/aop/article/view/73/149>

- Sonaliya, K. N. (2016). Infertility: Ongoing global challenge of new millennium. *Indian Journal of Community Health*, 28(2), 113–115. Retrieved from www.iapsmupuk.org
- Sormunen, T., Aanesen, A., Fossum, B., Karlgren, K., & Westerbotn, M. (2018). Infertility-related communication and coping strategies among women affected by primary or secondary infertility. *Journal of Clinical Nursing*, 27(2), 335–344. doi: 10.1111/jocn.139531080/0092623X.2015.1074133
- Sultan, S. & Tahir, A. (2011). Psychological consequences of infertility. *Hellenic Journal of Psychology*, 8(2), 229–247. Retrieved from https://journals.lww.com/jbisrir/Fulltext/2018/09000/Experiences_of_women_living_with_infertility_in.5.aspx#O3-5-7
- Syamala, T. S. (2012). Infertility in India: Levels, trends, determinants and consequences. *The Institute for Social and Economic Change* (pp. 1–21). Bangalore, India: ISEC.
- Tabong, P. T. N., & Adongo, P. B. (2013). Understanding the social meaning of infertility and childbearing: a qualitative study of the perception of childbearing and childlessness in northern Ghana. *PLoS One*, 8(1), 1–9. doi: 10.1371/journal.pone.0054429
- Tanywe, A., Matchawe, C., Fernandez, R., & Lapkin, S. (2018). Experiences of women living with infertility in Africa: a qualitative systematic review protocol. *Systematic Reviews and Implementation Reports*, 16(9), 1772–1778. Retrieved from https://journals.lww.com/jbisrir/Fulltext/2018/09000/Experiences_of_women_living_with_infertility_in.5.aspx#O3-5-7
- Tobin, D. L, Holroyd, K. A., Reynolds, R. V. C., & Wigal, J. K. (1989). The hierarchical factor structure of the Coping Strategies Inventory. *Cognitive Therapy and Research*, 13(4), 343–361. Retrieved from <https://link.springer.com/article/10.1007/BF01173478>

- Tsevat, D. G., Wiesenfeld, H. C., Parks, C. P., & Peipert, J. F. (2017). Sexually transmitted diseases and infertility. *American Journal of Obstetrics & Gynecology*, *216*(1), 1–9. doi: 10.1016/j.ajog.2016.08.008
- van Balen, F., & Trimbos-Kemper, C. M. (1995). Involuntarily Childless Couples: Their Desire to have Children and Their Motives. *Journal of Psychosomatic Obstetrics & Gynaecology*, *16*(3), 137–144. doi: 10.3109/01674829509024462
- Vander Borgh, M., & Wyns, C. (2018). Fertility and infertility: Definition and epidemiology. *Clinical Biochemistry*, *62*(1), 2–10. doi: 10.1016/j.clinbiochem.2018.03.012
- Vitale, S. G., La Rosa, V. L., Rapisarada, A. M. C., & Laganá, A. S. (2017). Psychology of infertility and assisted reproductive treatment: the Italian situation. *Journal of Psychosomatic Obstetrics & Gynecology*, *38*(1), 1–3. doi: 10.1080/0167482X.2016.1244184
- Wong, P. T. P., & Wong, L. C. J. (2006). Beyond stress and coping: The positive psychology of transformation. *Handbook of multicultural perspectives on stress and coping* (pp.1–5). Retrieved from <https://download.e-bookshelf.de/download/0000/0006/16/L-G-0000000616-0002368737.pdf>
- World Health Organisation. (2006). Multiple definitions of infertility. Retrieved from <http://www.who.int/reproductivehealth/topics/infertility/multiple-definitions/en/>
- Yu, Y., Peng, L., Chen, L., Long, L., He, W, Li., M., & Wang, T. (2014). Resilience and social support promote posttraumatic growth of women with infertility: The mediating role of positive coping. *Psychiatry Research*, *215*(2), 401–405. doi: 10.1016/j.psychres.2013.10.032
- Yu, Q., Zhang, J., Zhang, L., Zhang, Q., Guo, Y., Jin, S., & Chen, J. (2019). Who gains more? The relationship between parenthood and well-being. *Evolutionary Psychology*, *17*(3), 1–10. doi: 10.1177/1474704919860467

Chapter 2: Manuscript for submission

The coping strategies and psychological interventions in women with infertility: a rapid review

Tarryn Sardinha

15 Conradie street

Honeyhills

1724

Email: tarryn.sardinha@gmail.com

Prof. Karel Botha

School of Psychosocial Behavioural Sciences

Psychology

North-West University

Potchefstroom

Email: karel.botha@nwu.ac.za

The coping strategies and psychological interventions in women with infertility: a rapid review

Abstract

The aim of this study was to review the available scientific literature on coping strategies employed by women with infertility, as well the types of psychological interventions used in addressing infertility-related difficulties. A rapid review was conducted by identifying potential studies through EBSCO Discovery Services and applying thematic synthesis to analyse data. The findings of the review indicate that the experience of infertility is a personal challenge that interferes with personal life goals and needs. Active coping strategies were adaptive, seen through positive reappraisal, problem-solving, and acceptance. Positive religious coping and social coping were also seen to be adaptive, because they provide resources that effectively address the personal, identity, and social needs associated with being infertile. Avoidance coping strategies like fatalism and wishful thinking, in contrast, were associated with subsequent risks of developing anxiety, guilt, and depression. Recommendations are made that would improve our understanding of the psychological experience of infertility, the way society perceives infertility, and finally the extent to which counselling guidelines need to be tailored for specific cultural contexts.

Keywords: Infertility, women, coping strategies, psychological interventions, rapid review

Introduction

Parenthood is deemed one of the major transitions in adult life (Hardeep, Rohtash, & Rohtash, 2009). However, infertility has become more prominent in recent years, with approximately 48.5 million couples worldwide being affected in 2010, according to Mascarenhas, Flaxman, Boerma, Vanderpoel, and Stevens (2012). The World Health Organisation (2016) defines infertility as “a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse” (p. 1). There are two main types of infertility, namely primary and secondary infertility. Primary infertility refers to the inability to fall pregnant or conceive after 12 months of unprotected sexual intercourse, whereas secondary infertility refers to current infertility difficulties despite previously experiencing one or more successful pregnancies (American Society for Reproductive Medicine, 2016).

An inability to conceive can result in emotional, physical, and financial difficulties (Hasanpoor-Azghdy, Simbar, & Vedadhir, 2014), subsequently, it is experienced as a stressful event (Cousineau & Domar, 2007). The emotional impact of infertility is similar to that of serious chronic disease (Domar, Zuttermeister, & Friedman, 1993), which often manifests as anger, depression, anxiety, guilt, suicidality, marital problems, sexual dysfunction, and social isolation (Hardeep et al., 2009; Ramamurthi, Kavitha, Pounraj, & Rajarajeswari, 2016).

Rates of primary infertility are higher in other regions of the world in comparison to Africa, where secondary infertility is more prevalent (Gerais & Rushwan, 1992). Compared to developed countries, infertility in developing countries tends to be marginalised (Polis, Cox, Tunçalp, McLain, & Thoma, 2017) and, in Africa, is strongly associated with social stigma (Gerais & Rushwan, 1992). In 2004, in eight of the 23 countries in sub-Saharan Africa, more than 30 percent of women between the ages of 25 to 49 had secondary infertility

(Rutstein & Shah, 2004). The United Nations (2015) found that fertility rates in Africa are projected to decline to 3.9 children per woman by 2030 and 3.1 children per woman by 2050. Furthermore, the South Africa Demographic and Health Survey (2016) indicates that the total fertility rate in South Africa in 2016 was 2.6, in comparison to 2.9 in 1998. Current rates of infertility in South Africa are however difficult to find.

Males and females usually have similar rates of infertility (Inhorn & Patrizio, 2015). However, the onus of infertility in most societies is more often placed on women (Mascarenhas et al., 2012; Amakwe, 2013). Women tend to show elevated levels of distress compared to their male partners and higher psychological distress in comparison to women who can conceive (Hardeep et al. 2009). They also present with higher symptoms of anxiety, depression, and overall psychopathology (El Kissi et al., 2013).

Various researchers have recognised that women with infertility may use different strategies to cope and to regulate their emotions associated with the perceived challenges of infertility (Benyamini, Gozlan, & Kokia, 2004; Panagopoulou, Vedhara, Gaintarzi, & Tarlatzis, 2006; Sormunen, Aanesen, Fossum, Karlgren, & Westerbotn, 2018). Coping is defined as “constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman 1984, p. 141). Tobin, Holroyd, Reynolds and Wigal (1989) conceptualised coping styles as part of a hierarchy consisting of two factors, one of which is when an individual actively engages the problem and the other when the person avoids the problem. These are further divided into specific coping styles. Benyamini et al. (2004) found that cognitive representations of infertility tend to influence the type of coping strategies used. A study by Rapoport-Hubschman, Gidron, Reicher-Atir, Sapir, and Fisch (2009) found that emotion-focused strategies are positively associated with pregnancy rates in infertile women undergoing in vitro fertilisation (IVF). Coping is also considered to be an aspect of

emotional regulation, which refers to the internal and external processes of monitoring, evaluating, and modifying one's emotional reaction to accomplish a goal (Berking & Wupperman, 2012).

In terms of psychological interventions, therapeutic counselling in general was found to be effective in decreasing distress such as depression and anxiety in women with infertility (Kharde, Pattad, & Bhogale, 2012). Interventions such as cognitive behavioural therapy (CBT), acceptance and commitment therapy (ACT), and body-mind-spirit (BMS) and mindfulness-based interventions have been found to decrease infertility-related stress in females and may be useful for women experiencing infertility (Luk & Loke, 2016; Galhardo, Cunha, & Pinto-Gouveia, 2013). Infertile women may experience growth when assistance is given in developing positive coping strategies (Yu et al., 2014). Therefore, incorporating coping strategies into psychological treatment of woman may be of value.

However, many studies do not differentiate between the type of infertility and the associated coping strategies used by women. Additionally, many studies seem to be based in an urban or Westernised context (Abbasi, Dargahi, Jobaneh, & Mehjardi, 2016; Luk & Lok, 2016). In this regard, a scientific review might provide a synthesis of coping strategies employed by women in terms of both primary and secondary infertility. As infertility services are not widely available in developing countries (Asemota & Klatsky, 2015; Rouchou, 2013; Sembuya, 2010), the need to understand coping to assist women with infertility becomes even more prominent. A review may further help to assist mental health care providers with the development and catering of intervention plans to aid women with a specific type of infertility.

The aim of this study is therefore to review the available scientific literature on the coping strategies employed by women with infertility, as well as the types of psychological interventions used in addressing their infertility-related difficulties. In other words, it will (a)

identify coping strategies used, (b) describe psychological interventions used to address primary and secondary infertility, and (c) make treatment recommendations specifically regarding infertile women in developing countries.

Method

Research design

A rapid review was conducted to obtain data to be able to address the research question. Rapid reviews may be suitable in answering certain research questions and may be helpful in informing both clinical and policy choices (Watt et al., 2008). A rapid review consists of methods that synthesise available data within a shorter time frame than a systematic review, whilst remaining systematic (Ganann, Ciliska, & Thomas, 2010; Schünemann & Moja, 2015). The key principles of systematic reviews such as avoiding bias and maintaining transparency are still non-negotiable in a rapid review (Schünemann & Moja, 2015).

The search strategy

Keywords. Keywords were identified during a general review of the literature by perusing psychology journals and textbooks related to the topic. Boolean operators were matched with the keywords, their most common synonyms and the inclusion criteria to identify the following search levels:

“Coping” OR “coping strategies” OR “coping skills” OR “coping mechanisms” OR
“psychological interventions” OR “adaptive” OR “adaptive skills”

AND

“Infertility” OR “infecundity” OR “childlessness” OR “sterile” OR “sterility”

AND

“Women” OR “woman” OR “females” OR “female”

NOT

“Male” NOT “men” NOT “man” NOT “animals”

Databases. The search was conducted through EBSCO Discovery Services (EDS), on the North-West University’s database search portal. EDS is a search engine which provides access to the resources of 73 international and national databases such as PsycINFO, MEDLINE, JSTOR Journals and American Doctoral Dissertations (EDS Search, 2018).

Inclusion and exclusion criteria

The following criteria were used to include studies for this review: Studies published between 1984 and 2018. This is due to the fact that 1984 saw the development of Lazarus and Folkman’s stress and coping model, which initiated most of the coping research that is known today (Biggs, Brough, & Drummond, 2017; Folkman, 2013). Only studies with participants between the ages of 20 and 45 were included. This age group is deemed relevant as female fertility tends to peak in the early twenties and begins to decline significantly after the age of 35 (Meczekalski et.al., 2016). There is an increase in age-related fertility difficulties after the age of 35 and a significant increase after the age of 40 (Bewley, Davies, & Braude, 2005), with the average age of loss of fertility being approximately 41 (Jones & Lopez, 2013). Finally, inclusion of studies was limited to full-text journal studies published in English and/or Afrikaans; quantitative, qualitative, and mixed method studies published in peer reviewed journals; PhD theses, and studies in which at least one of the authors is a psychologist, to ensure the study is contextualised and interpreted from a psychological perspective.

Studies published in conference proceedings, non-peer reviewed studies and review studies, masters’ dissertations or mini-dissertations, and studies involving couples as participants were excluded. Couples were excluded due to three main reasons. Firstly, women tend to struggle more with the stressor of infertility than men (Hansell, Thorn, Pretnic-Dunn, & Floyd, 1998; Sexton, Byrd, O’Donohue, & Jacobs, 2010b). Secondly, regardless of which

partner is the cause of infertility, women are viewed as responsible for conception, and the majority of treatments are directed towards the woman (Pedro & Andipatin, 2014). Thirdly, gender can be considered a mediating factor in terms of the type of coping strategy used (Hansell et al, 1998; Sexton et al., 2010b).

Critical appraisal

Both authors were involved in the critical appraisal process. Titles and abstracts of studies identified by the keyword search were independently reviewed to determine relevancy and identify duplication studies. The outcomes of these independent reviews were compared and discussed to ensure agreement. The next step was to critically appraise the full text of each of the relevant studies according to the Joanna Briggs Institute (JBI) MASTARI criteria for quantitative studies and JBI QARI criteria for qualitative studies (The Joanna Briggs Institute, 2014). A final list of studies was then compiled. It is noted that a third reviewer was not required as any disagreements were resolved.

The outcome of the search, relevancy and critical appraisal process is presented in figure 1 below.

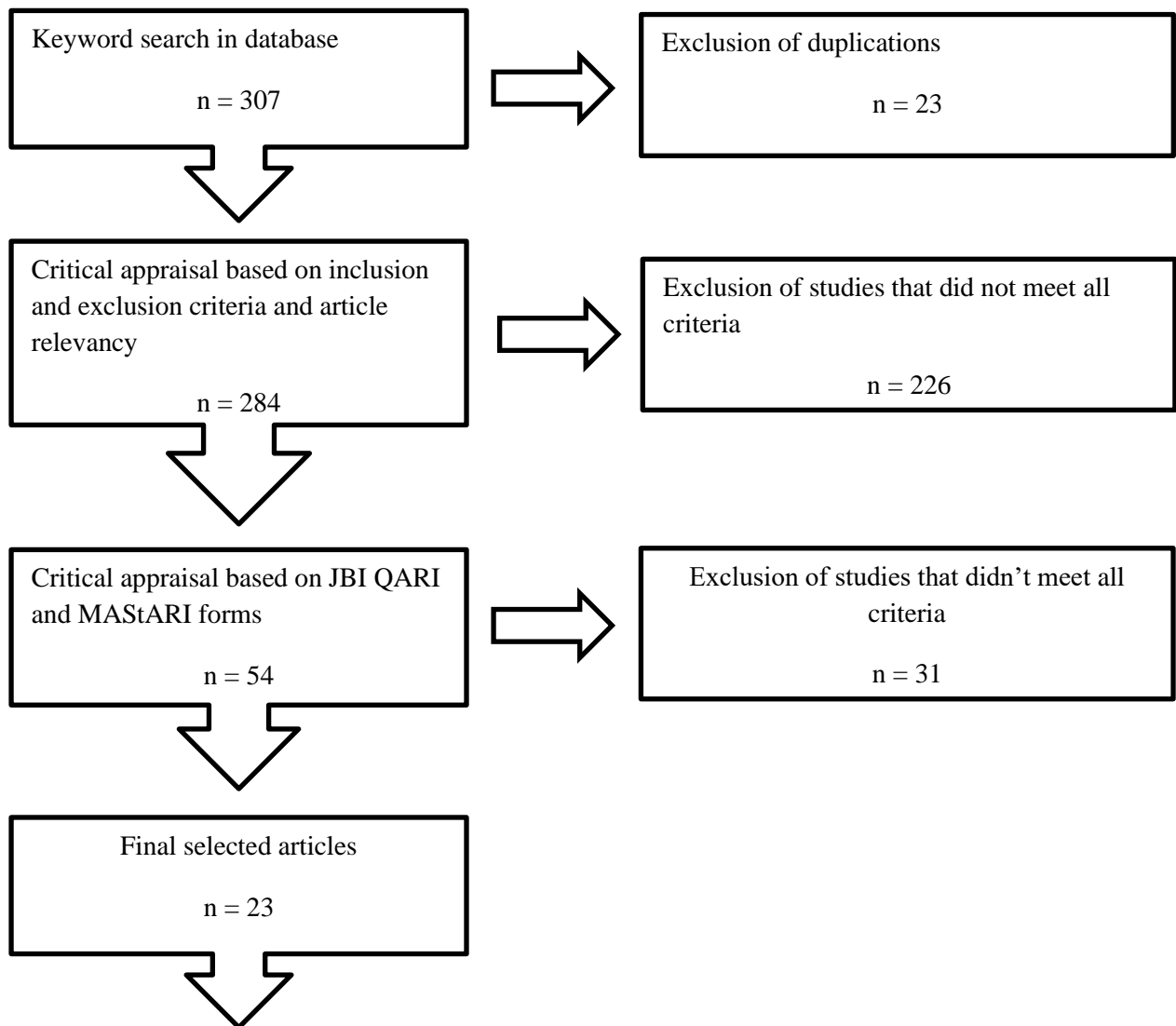


Figure 1. Search, relevancy and critical appraisal process

Data extraction

Data extraction begins with identifying the type of text and the background details and is then informed by the review question and type of data the researcher is interested in (JBI, 2014). As studies of both a qualitative and quantitative nature were included, a combination of the JBI QARI and MASTARI data extraction tools were used (JBI, 2014). Table 1 shows a summary of the data extraction for each selected study.

Table 1. Data extraction table.

No.	Title of article	Authors & Publication date	Methodology	Participants	Data analysis	Ethics	Core Findings
Qualitative studies							
1	A phenomenological analysis on infertility in Mexican women living in the United States	Brito, J. 2018	Qualitative exploratory methodology with semi-structured individual interviews	Six female participants of Mexican descent between the age of 25 and 44 with primary infertility	Giorgi and Giorgi's phenomenological method	Approved by the Institutional Review Board at the Pacifica Graduate Institute	<ul style="list-style-type: none"> • Infertility caused emotional distress, stigma, pressure to conceive, positive spousal support, and body and sex concerns. Primarily spiritual coping strategies such as prayer were used.
2	Childless in the land of imperative motherhood: Stigma and coping among infertile Israeli women	Remennick, L. 2000	Qualitative exploratory methodology using semi-structured individual interviews	Twenty-six Jewish women with primary infertility residing in Israel. The mean age was 36, with ages ranging from 25 to 46. Sample obtained through using snowballing.	Grounded theory	Consent to be interviewed was obtained	<ul style="list-style-type: none"> • Women engaged in selective disclosure about their infertility and stated that social support could only be provided by other infertile women. This may have been influenced by feeling that their work image was affected due to their childlessness. • Social alienation and self-isolation occurred in terms of not attending social activities where children might be. • To cope with the stigma, passive strategies including information management, defensive thinking, and strategic avoidance were used.
3	Coping strategies of women seeking infertility treatment in southern Ghana	Donkor, E.S., & Sandall, J. 2009	Survey-based interview with both open and closed questions	615 women who had received an infertility diagnosis and were receiving treatment at a gynaecology clinic which was at a hospital, health care centre or private clinic in Ghana. The age range was between 17 and 49 years with the mean age being 32.1 ± 6 years.	Descriptive and thematic analysis	Approval by the Institutional Review Board of Noguchi Memorial Institute, University of Ghana	<ul style="list-style-type: none"> • Coping strategies were grouped into five themes: denial/wishful thinking, talking to others, taking control, passing as normal, and fate or acceptance or blame. • The most commonly used strategies were lack of disclosure, engagement in distracting activities, religious coping (99% used prayer and 98% wished for a miracle) and avoiding self-blame. The awareness that other women were suffering from similar difficulties was helpful. • Spousal support from the husbands was apparent. • In terms of taking control, all participants contacted health professionals.

4	Psychosocial problems and coping strategies among Turkish women with infertility	Karaca, A., & Unsal, G. 2015	Descriptive qualitative design with in-depth interviews and use of the Fertility Problem Inventory (FPI)	24 infertile Turkish women experiencing primary infertility from the ages of 20 to 41 years. Participants were selected through purposive sampling.	Content analysis	Approved by the Non-invasive Clinic Studies Ethical Committee of Duzce University and the university hospital where the study took place. Participants provided both written and verbal informed consent. The FPI was adapted by Dr Eren for the Turkish population and he consented to its use.	<ul style="list-style-type: none"> • Nine themes related to psychosocial problems related to infertility were identified: meaning attributed to being childless, negative self-concept, perceived social pressure, perceived social support, psychological symptoms, social withdrawal and isolation, spiritual coping, cherishing hope or restructuring life, and use of traditional methods. • Emotion-focused coping methods were used most, as well as spiritual coping strategies and social avoidance. Women, however, had preference for confiding in other infertile women, with spousal support from their husbands being the most significant form of support. • Participants had negative world- and self-views. They experienced emotions of inadequacy, frustration, and guilt.
5	Women's experiences and preferences in relation to infertility counselling: A multifaith dialogue	Roudsari, R. L., & Allan, H. T. 2011	Semi-structured in-depth interviews	30 infertile women of either Islamic (Shiite or Sunni) or Christian (Protestant, Catholic and Orthodox) denominations. Participants either presented with primary or secondary infertility.	Straussian mode of grounded theory	Approved by the Research Ethics Committees of Queen Charlotte's and Chelsea Hospital, Elizabeth Garrett Anderson and Obstetrical Hospital and the University of Surrey. All participants completed informed consent forms.	<ul style="list-style-type: none"> • The use of both positive and negative religious coping strategies was utilised, improving their emotional capacity. Less reliance on counselling was found. • This positive reappraisal resulted in optimism that triggered women to start accepting infertility as a part of their lives and of God's will and to begin to take control.
Quantitative studies							
6	Association between coping strategies and infertility stress among a group of women with fertility problems in Shiraz, Iran	Aflakseir, A., & Zarei, M. 2013	Quantitative research design – use of the Fertility Problem Stress Scale and the Ways of Coping Scale	120 infertile Iranian females obtained through convenience sampling. All participants were undergoing infertility treatment. The mean age was 29.2, with the ages ranging from 24 to 52.	Multiple regression	Informed written consent was obtained.	<ul style="list-style-type: none"> • The most frequently used coping strategy was passive avoidance, followed by meaning-based coping, active-confronting coping and active-avoidance coping. • Meaning-based coping was significantly associated with low infertility-related stress, whereas active-avoidance coping was indicative of high infertility stress. • Passive avoidance and active confronting were not predictors of infertility stress.

7	Coping specificity: The case of women coping with infertility treatments	Benyamini, Y., Gefen-Bardarian, Y., Gozlan, M., Tabiv, G., Shiloj, S., & Kokia, E. 2008	Cross-sectional design with open-ended semi-structured interviews.	652 Israeli women with a mean age of 30.6. 60% had primary infertility and 40% had secondary infertility.	ADDTREE Clustering analysis, linear regression analyses	Inform written consent was obtained.	<ul style="list-style-type: none"> • Three main groups of coping strategies emerged, namely approach-avoidance, recruiting spouse support and practical management. The use of acceptance and recruiting spousal support became insignificant. • Emotional approach and problem appraisal strategies lead to higher psychological adjustment, whereas emotional avoidance and problem-management strategies are linked with worse adjustment. • Less distress occurred with the use of positive re-interpretation, spiritual coping and decreased use of problem management. Increased well-being was associated with disclosure, positive re-interpretation, spiritual coping and self-nurturing.
8	Effects of mindfulness-based intervention on fertility quality of life and pregnancy rates among women subjected to first in vitro fertilisation treatment	Li, J., Long, L., Liu, Y., He, W., & Li, M. 2015	Non-randomised control study with use of the Self-Compassion Scale, the Chinese version of the Five Facet Mindfulness Questionnaire, Fertility Quality of Life, Difficulties in Emotion Regulation Scale and the Copenhagen Multi-centre Psychosocial Infertility Coping Scales.	58 women who were undergoing in vitro fertilisation treatment at Southwest hospital in China completed the intervention and 50 women were a part of the control group.	ANOVAs	Informed consent was obtained and the study received ethical approval from the ethics committee of the Third Military Medical University.	<ul style="list-style-type: none"> • A six-week mindfulness-based intervention was developed where participants met once a week. • Following the intervention, participants presented with the following: a higher rate of mindfulness, self-compassion, meaning-based coping, a reduction in emotional regulation difficulties, and less use of active and passive-avoidance coping strategies.
9	Efficacy of emotion-focused and problem-focused group therapies for women with fertility problems	McQueeney, D. A., Stanton, A. L., & Sigmon, S. 1997	Quasi-experimental design. The following measures were used: COPE, Mental Health Inventory (MHI), Beck Depression Inventory (BDI), infertility-specific distress and well-being and an expectancy-credibility questionnaire.	29 women experiencing primary infertility and living in the United States of America.	Multivariate analyses of covariance and chi-square analysis	Informed consent was obtained.	<ul style="list-style-type: none"> • Participants underwent either an emotion-focused or problem-focused intervention, both of which resulted in less overall distress. • Emotion-focused participants reported less depression and higher rates of infertility-related well-being than the problem-focused group. After 18 months, the level of depression in both groups normalised. • Problem-focused interventions did not improve perception of control. • The results highlight the importance of emotional processing, with both approaches being deemed useful at the different stages of infertility.

10	Infertility stress: The role of coping strategies, personality trait, and social support	Rashidi, B., Hosseini, S., Beigi, P., Ghazizadeh, M., & Farahani, M. N. 2011	Descriptive and experimental research design with use of the Fertility Problem Inventory, Big Five Factor Personality Questionnaire, Multidimensional Scale of Perceived Social Support (MSPS), and Multidimensional Assessment of Coping.	201 infertile Iranian women with either primary or secondary infertility.	Pearson correlation and stepwise regression	Not indicated.	<ul style="list-style-type: none"> • Emotion-oriented coping, perceived social support, problematic confrontation, exciting confrontation and extraversion were negatively associated with infertility stress. • Emotion-oriented coping, obsessive compulsive disorder and extraversion were identified as predictors of infertility-related stress. • Social support was deemed a confronting approach to the stress of infertility; however, women would avoid social interactions in order to prevent being reminded of their infertility difficulties.
11	Measuring resilience in women experiencing infertility using the CD-RISC: Examining infertility-related stress, general distress and coping styles	Sexton, M. B., Byrd, M. R., & von Kluge, S. 2010	Quantitative research design with use of the Connor–Davidson Resilience Scale (CD-RISC), Symptom Checklist-90 (SCL-90), Beck Depression Inventory-II (BDI-II), Fertility Problem Inventory (FPI), and Ways of Coping Questionnaire (WCQ).	41 infertile women in the United States of America (USA) of a mean age of 33.3. 75% of participants had primary infertility.	Exploratory factor analysis	Approved by the Human Subjects Committee of Eastern Michigan University. Informed consent obtained from all participants.	<ul style="list-style-type: none"> • Lower levels of resilience were evident in infertile women. Infertility and general stress had a negative relationship with resilience whereas action-focused coping was positively associated with resilience.
12	Perceived stress, coping and hardy personality in infertile women	Almagiá, B. E., & Huespe, M. D. V. 2013	Quantitative research design with the use of the Scale of Perceived Stress (Spanish version) and Resistant Personality Questionnaire.	115 infertile women between the ages of 20 to 47 undergoing infertility treatment in Chile.	Descriptive statistics and Pearson's coefficients of correlation	Not indicated.	<ul style="list-style-type: none"> • The most frequently used coping strategy was positive reevaluation, followed by problem-solving and religious coping strategies. • Reference was made to the influence of a hardy personality, which allows a person to experience less stress and fewer negative effects due to stressful situations. • Perceived stress was negatively related to hardy personality, problem-solving and positive reappraisal. There was positive association between overt emotional expression and negative auto-focused coping, with stress being positively associated with open emotional expression and auto-negative focus.

13	Perception of control, coping and psychological stress of infertile women undergoing IVF	Gourounti, K., Anagnostopoulos, F., Potamianos, G., Lykeridou, K., Schmidt, L., & Vaslamatzis, G. 2012	Cross-sectional study. Use of Illness Perception Questionnaire-Revised (IPQ-R), Fertility Problem Inventory (FPI), State Trait Anxiety Inventory (STAI), Centre for Epidemiologic Studies-Depression (CES-D), and Brief COPE	137 women diagnosed with primary infertility in Greece. The mean age was 36.1, with ages ranging from 25 to 48 years.	Multivariate statistical techniques – Pearson's correlation coefficients and hierarchical multiple linear regression	Approved by the Research and Ethics Committee of Elena Benizelou hospital. Informed consent was obtained from all participants.	<ul style="list-style-type: none"> • The results indicate that cognitive coping strategies are more effective as they decrease fertility-related stress and increased positive treatment results. • Problem-focused coping, specifically problem-management and high perceived treatment control were positively correlated. Problem-management was not predictive of adjustment or stress levels. Problem appraisal was associated with less fertility-related stress and fewer depressive symptoms. • Emotion-focused coping was associated with higher rates of fertility-related stress, anxiety, and depressive symptoms. • Avoidance coping was used often when perception of personal and treatment control was low and was found to be positively correlated with stress and fertility-related anxiety.
14	Psychofortology of women undergoing infertility treatment	Fouché, P., Nortjé, N., Phillips, K., & Stroud, L. 2011	Quantitative, cross-sectional design with use of Coping Resources Inventory (CRI), the Orientation to Life Questionnaire, the Satisfaction with Life Scale (SWLS), and the Affectometer-2 Scale (AFM-2).	61 South African infertile women obtained through non-probability purposive sampling. Ages ranged between 30 to 45 years, with a mean age of 34.5.	Descriptive statistics, cluster analysis and ANOVA	Approval obtained by the Ethics Committee of the Nelson Mandela Metropolitan University. Informed consent was obtained from the participants.	<ul style="list-style-type: none"> • The most commonly used coping strategy was spirituality, with some participants utilising physical coping resources such as exercise. A preference for emotional coping resources emerged. • Difficulties with expressing and regulating emotions was apparent.
15	Psychological impact and coping strategies among women with infertility – A hospital based cross sectional study	Ramamurthi, R., Kavitha, G., Pounraj, D., & Rajarajeswari, S. 2016	Cross-sectional study	150 women undergoing infertility treatment, mainly of the ages between 21 and 25 years, in Tamil Nadu, India.	Descriptive analysis using IBM Statistics Package for Social Sciences (SPSS)	Informed consent obtained and confidentiality maintained.	<ul style="list-style-type: none"> • The most frequently used coping strategy was engagement in household chores and hobbies. 32.1% engaged in social isolation, 13.95% used crying to cope and 10.47% relied on familial support or alternatively did not use a coping strategy. • The more effective the coping strategy the more women are inclined to share their opinions and be more social. • It was concluded that infertile women have elevated levels of anxiety, guilt, pessimism, and suicidality.

16	Psychological health and religious coping of Ghanaian women with infertility	Oti-Boadi, M, Asante, K. O. 2017	Cross-sectional survey with use of the Brief Symptom Inventory Brief Religious Coping Scale (Brief RCOPE), a socio-demographic questionnaire, and the Brief Symptom Inventory (BSI).	150 married infertile women with a mean age of 34.3 who had either primary or secondary infertility. Participants were receiving assisted reproduction treatment. The sample was obtained through purposive sampling.	Descriptive statistics, Pearson correlation coefficients matrix and hierarchical regression with use of SPSS.	Approved by the hospital where study took place. Informed consent obtained from each participant.	<ul style="list-style-type: none"> • Positive religious strategies were used more frequently than negative religious coping. Negative religious coping had a positive association with somatisation, depression, and anxiety and are considered predictors thereof. However, positive religious coping is positively correlated with somatisation and anxiety, however not with depression and are consider predictors of the aforementioned. • The longer the period of infertility, the higher the rate of depression, somatisation and anxiety. • Due to the importance of religion in the Ghanaian (and most African) cultures, the use of negative religious coping was associated with poor psychological health.
17	Psychosocial vulnerability, resilience resources and coping with infertility	Driscoll, M.A., Davis, M. C., Aiken, L. S., Yeung, E. W., Sterling, E. W., Vanderhoof, V., Calis, K. A., Popat, V., Covington, S. N., & Nelson, L. M. 2015	Longitudinal study. The following measures were used: Big Five Inventory, Lemon Stigma Scale, Mischel Uncertainty in Illness, Life Orientation Test – revised, Rosenberg Self-Esteem Scale, Pearlin Mastery Scale, Ego Resilience Scale, Brief COPE, Antoni’s 16-item Benefit Finding scale, Centre for Epidemiologic Studies Depression Scale, State-Trait Anxiety Inventory and Positive, Negative Affect Schedule, and Positive Mental Well-being Inventory.	102 women with primary ovarian insufficiency between the ages of 18 and 42 in the USA. The mean age was 32.	Factor analysis and chi-square tests	Approved by the Institutional Review Board and NIH. Informed consent was received from all participants.	<ul style="list-style-type: none"> • Two factors emerged, mainly approach coping and letting go and moving on strategies. Letting go was associated with well-being, whereas avoidance coping was correlated with distress and considered as a maladaptive strategy and the strongest mediator between distress and psychosocial vulnerability. • Strategies that address cognitive aspects are deemed significant predictors of positive affect.

18	The mediational role of cognitive emotion regulation strategies in the relationship of ego-strength and adjustment to infertility in women	Teimourpour, N., Besharat, M. A., Rahiminezhad, A., Rashidi, B. N., & Lavasani, M. G. 2015	Quantitative research design using questionnaires – demographic information questionnaire, Ego-Strength Scale (ESS), Cognitive Emotion Regulation Questionnaire (CERQ) and Adjustment to Illness Scale (AIS).	275 women with primary infertility in Iran. Mean age was 31.8 years.	Use of SPSS and LSIREL to conduct Pearson correlation and path analysis.	Informed consent obtained from all participants.	<ul style="list-style-type: none"> • Both adaptive and non-adaptive cognitive emotion regulation strategies are mediating factors between ego strength and adjustment. • Adaptive cognitive emotion regulation strategies result in higher adjustment levels, higher levels of ego strength, and a decrease in negative emotions, whereas non-adaptive cognitive emotion regulation strategies lead to lower levels of adjustment. • Long-term use of non-adaptive cognitive emotion regulation strategies led to heightened levels of stress, depression, and anxiety.
19	The relationships of primary appraisals of infertility and other gynaecological stressors to coping	Hansell, P. L., Thorn, B. E., Pretnic-Dunn, S., & Floyd, D. L. 1998	Quantitative research design with the use of McCrae's Coping Questionnaire.	100 women of which 25 women had primary infertility, 25 in a medical gynaecological group, 22 in a pregnancy group and 28 in a control group. Based in the USA.	Univariate analyses of variance, chi-square analyses, and MANOVA.	Informed consent obtained.	<ul style="list-style-type: none"> • Infertility was either appraised as a loss or a challenge. When appraised as a loss, wishful thinking and fatalism were used more frequently. Conversely, when appraised as a challenge, it was associated with less stress but higher fatalism and restraint. • Women engage in escape and problem-solving strategies.
20	The role of religious coping strategies in predicting depression among a sample of women with fertility problems in Shiraz	Aflakseir, A., & Mahidiyar, M. 2016	Quantitative research design with use of the Beck Depression Inventory and Religious Coping Scale.	72 infertile women with a mean age of 31.6. Sample obtained through convenience sampling.	Descriptive statistics, Pearson's correlation, and multiple regression analysis using SPSS.	Approved by the Research Committee of the University of Shiraz. Informed consent obtained from participants.	<ul style="list-style-type: none"> • Most frequently used religious coping strategy was practice and active religious coping. Depression decreased with the use of active practice and benevolent reappraisal coping. Benevolent reappraisal resulted in the highest depression reduction. • Overall, use of religious coping results in fewer depressive symptoms.

21	Web-based treatment for infertility-related psychological distress	Sexton, M. B., Byrd, M. R., O'Donohue, W. T., & Jacobs, N. J. 2010	Quantitative research design with use of BDI-II, Symptom Checklist 90-Revised and the Fertility Problem Inventory.	31 infertile women in the United States of America. 74% of participants had primary infertility with the rest having secondary infertility. Sample obtained by randomised assignment.	T-test and chi-square analyses, as well as ANOVA	Approved by the Human Subjects Committee at Eastern Michigan University. Informed consent obtained from participants.	<ul style="list-style-type: none"> • Web-based approaches may be suitable as a treatment platform due to the privacy, reduced time, financial, and social implications. The online CBT approach, however, may not be effective in a web-based format. • A short-term reduction in overall stress resulted in the usage of self-help and web-based approaches in addressing infertility needs. However, this change was not significant enough.
Mixed method studies							
22	Infertility, psychological distress, and coping strategies among women in Mali, West Africa: A mixed-methods study	Hess, R. F., Ross, R., & Gililland Jr, J. L. 2018	Mixed-method design: correlational cross-sectional and qualitative descriptive	58 Malian women experiencing either primary or secondary infertility. 48% had primary infertility and 52% had secondary infertility. The ages ranged from 17 to 48 years, with a mean age of 33.	IBM SPSS, descriptive statistics, point biserial correlation, and content analysis to develop themes.	Approved by ethics committee of Malone University Ohio and Hospital for Women and Children in Koutiala, Mali. Informed consent was obtained.	<ul style="list-style-type: none"> • Infertility was associated with distress, feelings of inferiority, marital conflict, and stigma. • Three main methods were used to cope with infertility, primarily isolation and religion (42%). Malian women used a mixture of mainly traditional and Western medicine, as well as their traditional beliefs.
23	What are the issues confronting infertile women? A qualitative and quantitative approach	Hämmerli, K., Znoj, H., & Berger, T. 2010	Qualitative and quantitative design. The following questionnaires were used: Centre for Epidemiological Studies Depression Scale (CES-D) and State-Trait Anxiety Inventory (STAI).	57 women experiencing either primary or secondary infertility from the ages of 26 to 42 years.	Content analysis and use of Cohen's kappa, Spearman rank correlations and Mann-Whitney U tests.	Approved by the Cantonal Research Ethics Committee in Bern, Switzerland.	<ul style="list-style-type: none"> • Active-confronting coping (35.1%) was the most used coping strategy, followed by meaning-based (28.8%), active-avoidance (16.2%) and passive-avoidance coping (12%). The use of coping strategies was not fixed. • Women who were anxious experienced more positive and negative emotions and those that were both anxious and depressed experienced more negative emotion. • Being able to express their emotions was beneficial, as well as learning to regulate their emotions.

Data analysis

A thematic synthesis approach (Thomas, O'Mara-Eves, Kneale, & Shemilt, 2017) was used to combine and analyse the findings of the selected studies and was done inductively. This approach is popular in review studies as it provides clear and rigorous guidelines for analysing research in three stages, namely 1) coding text, 2) developing descriptive themes, and 3) generating analytical themes (Thomas & Harden, 2008). This approach proves useful for analysing quantitative, qualitative, or mixed-method studies. During the first stage (coding text), themes from the selected studies' findings were identified by the researcher, which involved highlighting and establishing links and conceptual similarities between the texts from different studies (Thomas & Harden, 2008). In the case of quantitative studies, the focus of the synthesis is on text describing and explaining statistical data/findings, rather than on the statistics themselves. During stage two (developing descriptive themes) identified themes are clustered together under descriptive themes (Thomas et al., 2017). Finally, during stage three (generating analytical themes) analytical themes are established by developing new explanations and conceptualisations in order to address the review questions (Thomas et al., 2017).

Ethical issues

As rapid reviews do not involve human subjects, the risk of harm is minimal. However, steps were taken to ensure the scientific integrity and accuracy of the research. The proposal for this study was scientifically approved by the scientific committee of the North-West University's Community Psychosocial Research (COMPRES) research entity. To avoid redundancy and duplicating previously published research (Wager & Wiffin, 2011), the researcher conducted a preliminary scope review. To prevent possible plagiarism, the research has adhered to the APA referencing guidelines. Cognisance was taken to identify any plagiarism apparent in any of the studies during the methodological process. In order to

ensure transparency and rigour, the rapid review methodology process was strictly adhered to. Possible bias in the selection of studies was reduced by identifying inclusion and exclusion criteria beforehand. Finally, submission to Turnitin showed an acceptable level of similarity between this study and other texts, with no indication of plagiarism.

Results

Twenty-three studies met the inclusion criteria and addressed the aims of this study. Of these, 18 studies predominantly addressed aim 1, and five studies primarily addressed aim 2 of this study. Most of the studies included were based in developing countries or included women from cultures that originated from developing countries, mainly Ghana, India, Iran, Israel, Mali, Mexico, South Africa, and Turkey. A few studies, however, derived their samples from developed countries, specifically the United Kingdom, China, Chile, Greece, Switzerland, and the United States of America.

Themes and subthemes are depicted in Figure 2 (coping – aim 1) and Figure 3 (psychological interventions – aim 2).

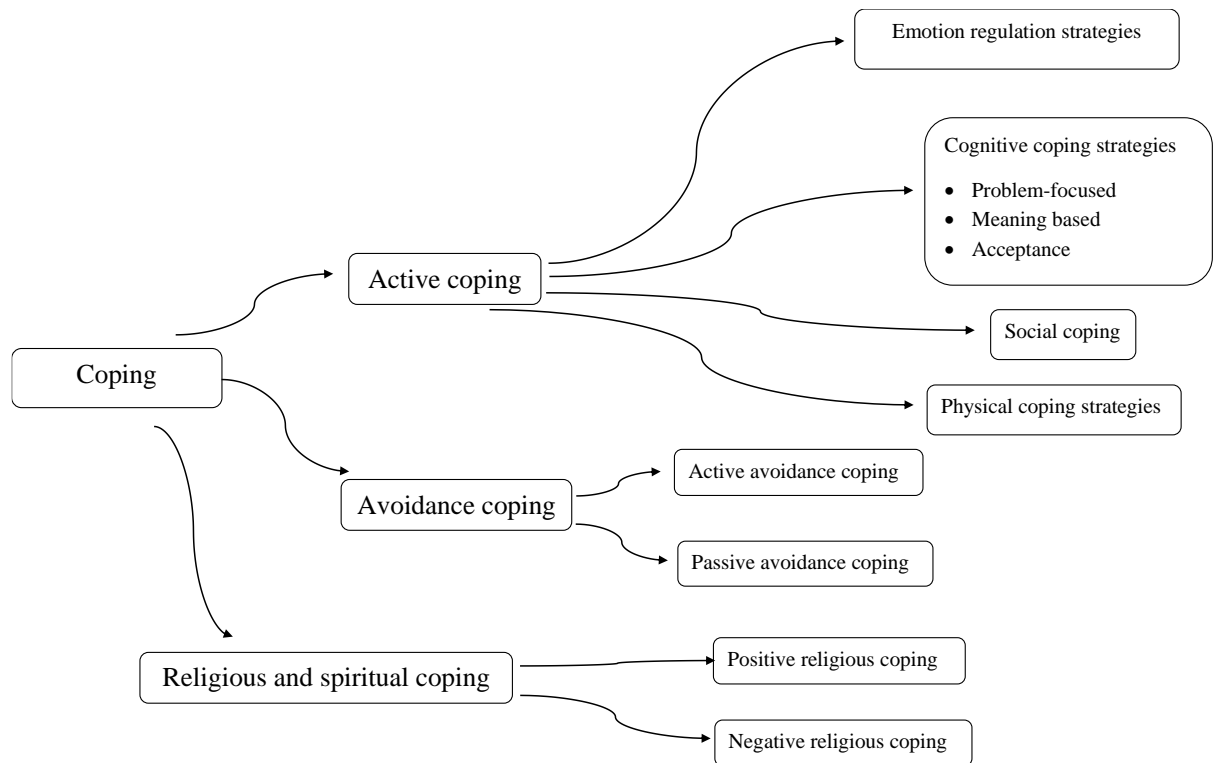


Figure 2. A visual representation of themes and subthemes related to aim 1 (coping with infertility)

Aim 1 – Coping

From the review, it is clear that infertile women tend to have elevated levels of anxiety, inadequacy, depression, frustration, guilt, pessimism, somatisation, and suicidality (Karaca & Unsal, 2015; Oti-Boadi & Asante, 2017; Ramamurthi et al., 2016). Infertility often causes distress due to social-cultural expectations relating to bearing children, resulting in the experience of social pressure, stigma, and the development of a negative world- and self-view (Hess, Ross, & Gililand Jr, 2018; Karaca & Unsal, 2015).

Women used a variety of coping strategies to manage their infertility, clustered into three main subthemes, namely active coping, avoidance coping, and religious and spiritual coping.

Active coping. Zeidner and Endler (1996) define active coping as the use of one's own psychological and behavioural resources to reduce or change the stressful nature of a situation or to change the cognitions and emotions associated with the stressor. In the reviewed studies, active coping consisted of emotion regulation strategies, cognitive coping strategies, social coping, and physical coping strategies. If women appraised infertility as a loss, active coping was used more frequently (Hansell et al., 1998). Active-coping strategies were found to be positively associated with resilience (Sexton, Byrd, & von Kluge, 2010a).

Emotion regulation strategies. Emotion regulation can be described as the management of behaviour, thoughts, and physical functions in the aim of changing, expressing, or retaining the emotions (Teimourpour, Besharat, Rahiminezhad, Rashidi, & Lavasani, 2015), and can either be adaptive or non-adaptive. In total, nine studies referred to emotion regulation strategies. In a South African study (Fouché, Nortjé, Phillips, & Stroud, 2011), infertile women preferred emotion-focused coping mechanisms; however, difficulties with expressing and regulating emotions were apparent. Turkish women also mainly used emotion-focused coping strategies (Karaca & Unsal, 2015).

Two main types of adaptive emotion regulation strategies emerged: adaptive cognitive emotion regulation strategies and emotional approach coping. Cognitive emotion regulation styles specifically refer to cognitive strategies that assist in managing emotions (Teimourpour et al., 2015). The use of adaptive cognitive emotion regulation strategies resulted in higher adjustment levels and less negative emotions (Teimourpour et al., 2015). Adaptive emotional approach strategies took the form of being nurturing to oneself and were also associated with higher levels of adjustment (Benyamini et al., 2008; Brito, 2018).

Non-adaptive emotional regulation is defined by Aldao, Nolen-Hoeksema, and Schweizer (2010) as the use of strategies such as rumination and avoidance that result in poor affect control and higher rates of psychopathology. Studies in the review indicated that non-

adaptive emotional regulation strategies were associated with lower levels of adjustment, and in the long term, higher rates of stress, depression and anxiety (Teimourpour et al., 2015). Types of strategies deemed to fit with the definition of non-adaptive emotional regulation strategies were avoidant emotion-focused coping, rumination, and negative self-focus. Emotional avoidance can occur in the form of inward anger and has been correlated with poorer adjustment (Benyamini et al., 2008). Infertile Malian women were found to have isolated themselves in response to emotional distress (Hess et al., 2018). Rumination was evident in studies by Hess et al. (2018) and Hämmerli, Znoj, and Berger (2010). Self-negative focus was a less frequently used strategy and was associated with higher rates of stress (Almagiá & Huespe, 2012). In a study by Rashidi, Hosseini, Beigi, Ghazizdeh, and Farahan (2011) it was found that emotion-oriented coping was negatively correlated with perceptions of social support and extraversion, and predicted infertility-related stress. Gourounti, et al., (2012) also found this type of coping strategy to be associated with higher rates of fertility-related stress, anxiety and depressive symptoms. Although open emotional expression such as crying was used less frequently, it was also associated with higher levels of stress (Almagiá & Huespe, 2012; Ramamurthi et al., 2016).

Cognitive coping strategies. In this study, cognitive coping specifically refers to cognitive efforts made to reduce or address a stressor (Lazarus & Folkman, 1980). Driscoll et al. (2016) found that coping strategies that address cognitive aspects are deemed significant predictors of positive affect. The use of cognitive coping strategies resulted in a decrease in fertility-related stress and an increase in positive treatment outcomes (Gourounti et al., 2012). Three specific strategies were identified by the writer as fitting into the abovementioned coping strategy, namely problem-focused coping, meaning-based coping, and acceptance.

Problem-focused coping. Lazarus and Folkman (1984) defined problem-focused coping as the process of removing or reducing the impact of the stressor. Three studies in the review

discussed problem-focused coping. Almagiá and Huespe (2012) found problem-solving to be the second-most commonly used coping mechanism. Examples of problem-focused coping were problem management, problem appraisal, developing a plan of action, seeking professional help, and obtaining information (Benyamini et al., 2008; Donkor & Sandall, 2009; Driscoll et al., 2015; Gourounti et al., 2012). The duration of infertility influenced the use of problem-focused coping – Karaca and Unsal (2015), for example, found that longer periods of infertility initiated planning for the future, such as considering adoption. The use of problem-solving elicited a sense of control over infertility and of responsibility (Hansell et al., 1998), while it was also associated with higher psychological adjustment, decreased fertility-related stress, and depressive symptoms (Benyamini et al., 2008; Gourounti et al., 2012; Almagiá, & Huespe, 2012).

Meaning-based coping. Coping through meaning refers to the use of strategies that help to change the way one thinks of infertility and establishing other goals in life (Aflakseir & Zarei, 2013). Four studies reported meaning-based coping. According to Hämmerli et al. (2010), meaning-based coping was one of the most frequently used strategies. The positive re-interpretation of infertility was generally associated with lower levels of distress and higher levels of well-being (Benyamini et al., 2008; Aflakseir & Zarei, 2013).

Acceptance. Acceptance can be challenging to achieve and relates to the development of one's own private narrative (Benyamini et al., 2008) of accepting the reality of infertility. Driscoll et al. (2016) identified the strategy of letting go and moving on as adaptive as it was positively correlated with well-being and less self-blame, while Benyamini et al. (2008) reported an association between acceptance, disclosure, and positive reinterpretation. However, acceptance may also be maladaptive, especially when the stressor is acknowledged but no efforts are made to reduce or address the stressor (Fauerbach et.al, 2009). In the study

by Benyamini et al. (2008), acceptance also included aspects of self-blame, which can be maladaptive over the long-term.

Social coping strategies. In this study, social coping refers to efforts by individuals to elicit social support, for example, receiving compassion and company from others (Rashidi et al., 2011). The same authors referred to the use of social support as a confronting strategy where infertile women can share their concerns regarding infertility with close others. Common sources of social support were spouses, family and friends who were also experiencing infertility (Brito, 2018; Karaca & Unsal, 2015; Ramamurthi et al., 2016; Roudsari & Allan, 2011). Overall, social support was negatively associated with infertility-related stress and resulted in less self-blame and a sense of belonging (Rashidi et al., 2011).

Physical coping strategies. Physical coping strategies can be described as the use of physical means to improve health and physical well-being (Fouché, et al., 2011). Only one study referred to the use of physical coping strategies, and in this study, it was indicated that infertile South African women made use of physical exercise for this reason (Fouché, et al., 2011).

Avoidance coping. Avoidance coping refers to any cognitive and/or behavioural manner of denying, reducing, or avoiding the acknowledgment of a stressor (Cronkite & Moos, 1995; Penley, Tomaka, & Wiebe, 2002), and is therefore also known as escape coping. It differs from avoidance as an emotion regulation strategy (see earlier) in that the focus there is on avoiding a specific emotion itself; for example, by suppressing or denying it. Eight studies presented with avoidance coping strategies. The studies indicate that they are frequently used when the perception of control over the stressor is perceived as low, as is the case with infertility (Gourounti et al., 2012). If infertility is appraised as a loss, women engage frequently in fatalism (Hansell et al., 1998). What women try to avoid seems to centre around four aspects, namely (a) disclosing their infertility diagnosis, (b) discussing their

infertility-related difficulties, (c) obtaining information related to infertility, and (d) thinking about being infertile (Donkor & Sandall, 2009).

Aflakseir and Zarei (2013) described avoidance as adaptive whereas Driscoll et al. (2016) identified it as a significant mediating, but maladaptive, strategy between distress and psychosocial vulnerability. Avoidance coping was correlated with distress, anxiety, and depression (Driscoll et al., 2016; Gourounti, 2012). Two subtypes of avoidance were identified, namely active and passive avoidance coping.

Active avoidance coping. This type of coping is described as a defence strategy involving the use of other activities to prevent disclosing, discussing, or thinking about the infertility diagnosis, or thinking about the stressor of infertility (Schmidt, Christensen, & Holstein, 2005). Eight studies in the review (Aflakseir & Zarei, 2013, Brito, 2018; Donkor & Sandall, 2009; Hämmerli et al.; 2010; Karaca & Unsal, 2015; Ramamurthi et al., 2016; Rashidi et al., 2011; Remennick, 2010) reported the use of active avoidance coping in infertile women. Distraction was utilised by keeping busy through focusing on career, creative activities, watching movies, or spending time with friends and family (Donkor & Sandall, 2009). The most commonly used form of distraction was keeping oneself busy with household chores or hobbies (Ramamurthi et al., 2016). Although Aflakseir and Zarei (2013) found active avoidance to be the least-used strategy in their study, they found it to be associated with high levels of stress.

Avoidance of social situations emerged as a common strategy – according to Remennick (2000) for example, women would selectively disclose their infertility status and engage in strategic avoidance, which refers to avoiding social situations where discussions regarding infertility would arise. Social isolation and social withdrawal were also evident in the avoidance of social activities where children might be present (Karaca & Unsal, 2015; Rashidi et al., 2011; Remennick, 2000), avoidance of friends with children, as well as

avoiding family (Brito, 2018; Ramamurthi et al., 2015). It is, however, considered to be an ineffective coping strategy (Karaca & Unsal, 2015).

Passive avoidance coping strategies. Passive avoidance refers to feelings of hopelessness in response to a stressor and the reliance on others to address and solve the stressor (Zeidner & Endler, 1996). Four studies (Aflakseir & Zarei, 2013; Hämmerli et al., 2010; Hansell et al., 1998; Roudsari & Allan, 2011) reported passive avoidance strategies, including wishing for a miracle, ignorance, minimisation, and compensation. Hansell et al. (1998) found that wishful thinking was used more frequently if infertility was appraised as a loss. However, even though passive avoidance coping strategies were associated with high infertility-related stress, they were not found to be predictors thereof (Aflakseir & Zarei, 2013).

Religious and spiritual coping. Oti-Boadi and Asante (2017) describe religious coping as the “efforts made by individuals to deal with life stressors in ways that are associated with the divine or are imbued with divine-like qualities” (p. 2). In total, 10 studies referred to religious and spiritual coping. According to Karaca and Unsal (2015), spiritual coping may also be seen as an emotion-focused strategy, and, even if it does include aspects of active and avoidance strategies, it is classified on its own as it integrates different levels of coping in a unique way. Spiritual coping was the most common strategy in South African women (Fouché, et al., 2011), and was prominent in at least three other studies as well (Almagiá & Huespe, 2012; Brito, 2018; Hess et al., 2018). Religious coping can be subdivided into positive and negative coping, with positive religious strategies used more (Oti-Boadi & Asante, 2017).

Positive religious coping. Positive religious coping relates to having belief in and having a secure bond with what is personally considered a supreme power, and taking control of aspects of life that facilitate the acceptance of infertility (Oti-Boadi & Asante, 2017;

Roudsari & Allan, 2011). Five studies identified positive religious coping strategies – examples include a belief in spiritual support, prayer, wishing for a miracle, benevolent religious reappraisal, involvement in rituals, and support from the religious congregations (Brito, 2018; Donkor & Sandall, 2009; Roudsari & Allan, 2011). It is interesting to note that somatisation and anxiety, but not depression, predicted the use of positive religious coping (Oti-Boadi & Asante, 2017). Depression did however decrease with the use of religion, especially when benevolent reappraisal is involved (Aflaskeir & Mahidiyar, 2016).

Negative religious coping. Negative religious coping is a relationship with the sacred that is characterised by conflict and tension (Oti-Boadi & Asante, 2017). Only three studies reported negative religious coping strategies, including demonic reappraisal, and spiritual and clergy discontent (Aflaskeir & Mahidiyar, 2016; Oti-Boadi & Asante, 2017; Roudsari & Allan, 2011). Like positive religious coping, the use of negative religious coping was also predicted by somatisation and anxiety – however, it was also predicted by depression, and in addition, it was also associated with poorer psychological health (Oti-Boadi & Asante, 2017).

Despite this association with poor psychological health, findings do seem to be contradictory – according to some researchers the use of religious coping strategies, both positive and negative, results in less distress and depressive symptoms (Aflaskeir & Mahidiyar, 2016; Benyamini et al., 2008), as well as in spiritual growth (Roudsari & Allan, 2011).

Aim 2 – Psychological interventions

Infertility counselling aims at addressing and resolving any infertility-related difficulties and assisting with ways to cope more effectively (Roudsari & Allan, 2011). Hansell et al. (1998) recommend that psychological interventions should be adapted, as not all women share the same experience of infertility. Figure 3 shows the various psychological interventions that emerged.

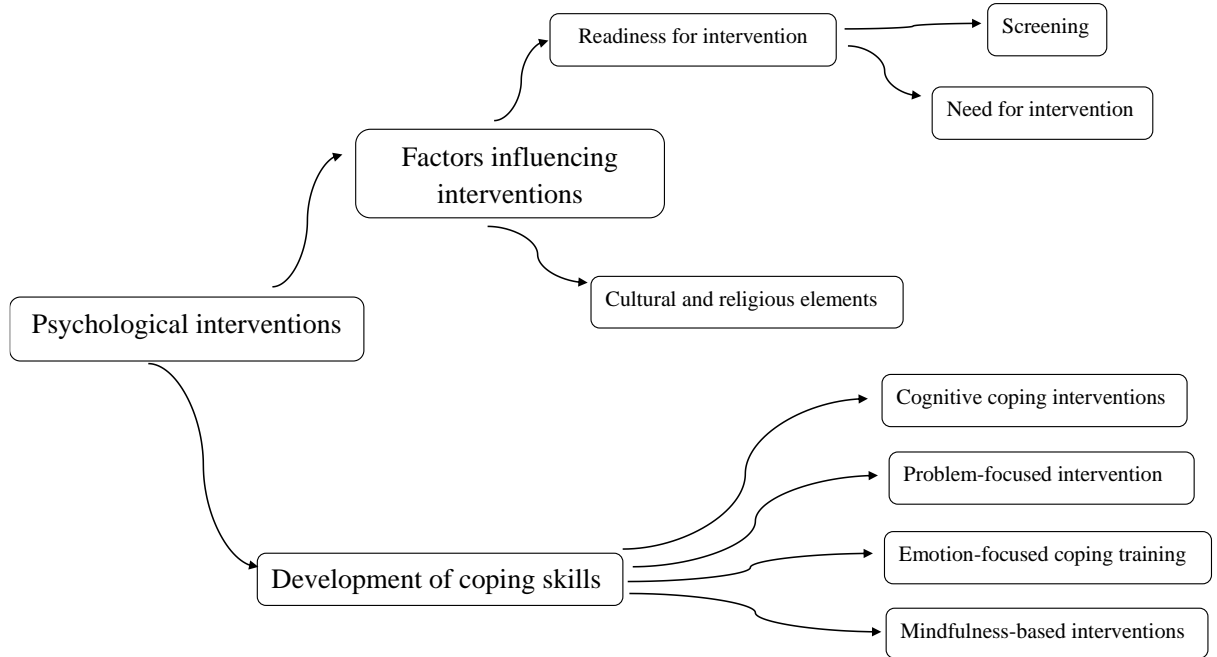


Figure 3. A visual representation of themes and subthemes related to aim 2 (psychological interventions for infertile women)

Factors influencing interventions. Within this subtheme two main aspects were identified as influential factors to treatment: readiness for intervention and cultural elements.

Readiness for intervention. Two main contributing factors were recognised, which are screening and need for intervention. Screening infertile women prior to selecting an appropriate psychological intervention was identified as important for several reasons. According to Hess et al. (2018) it would be important to screen for distress and socio-cultural pressure in Malian infertile women prior to making an appropriate referral and them receiving counselling. Gourounti et al. (2012) propose that identifying women's perception of control and coping strategies may assist in determining which individuals have a high risk of fertility-related stress and need support. Teimourpour et al. (2015) suggest that identifying a woman's ego strength will alternatively assist in identifying high-risk females. An association

between resilience and infertility-related and general distress exists and may assist health practitioners in identifying at-risk infertile females, as well as determining which coping strategies should be focused on (Sexton et al., 2010a).

An additional factor to be considered is the personality traits of infertile women, as they were found to contribute to the variability of infertility stress (Rashidi et al., 2011). Almagiá and Huespe (2012) describe a hardy personality that is negatively associated with stress but positively associated with problem-solving and positive reappraisal. This type of personality allows a person to experience less stress and negative effects due to stressful situations, allowing for growth, access to social support, and use of coping strategies to address the problem while maintaining well-being (Almagiá & Huespe, 2012).

A woman's perceived need for psychological intervention tends to be specifically influenced by her faith and religious beliefs – according to Roudsari and Allan (2011), women found their religion to be a sufficient form of support and resultantly had a decreased need for any form of counselling or psychological support.

Influence of cultural and religious beliefs. It is clear from the review that a woman's religious and spiritual beliefs should be taken into consideration in the context of infertility counselling and the development of therapeutic interventions and the importance of the aforementioned should be determined during the early stages of counselling (Karaca & Unsal, 2015; Oti-Boadi & Asante, 2017; Roudsari & Allan, 2011). In addition, counsellors should consider their own religiosity and the impact thereof (Roudsari & Allan, 2011). Factors that may prevent religious women from utilising counselling services are firstly, the need for disclosure to someone who is anonymous, secondly, the associated stigma, and thirdly, having to discuss issues of a sexual nature (Roudsari & Allan, 2011). Culture may be a further contributing factor – Hess et al. (2018), for example, noted that Malian women used a mixture of mainly traditional and Western treatment options for infertility. Finally,

Roudsari and Allan (2011) indicate that women tend not to see the need for counselling as they rely on their own religious coping strategies.

Development of coping skills. Four main types of interventions were identified in the review.

Cognitive coping interventions. The findings of Gourounti et al. (2012) suggest that cognitive coping interventions are effective in reducing infertility-related stress and improving treatment outcomes. It is interesting to note that the internet is increasingly being used as a delivery method for infertility treatment interventions. Hämmerli et al. (2010), for example, developed an eight-week internet-based cognitive behavioural treatment, where participants had access to a therapist by email to assist with coping with infertility. Being provided with the opportunity to express emotions was a beneficial effect of the treatment and was identified as an important need for infertile women, in addition to regulating their emotions (Hämmerli et al., 2010).

Sexton et al. (2010b) also delivered a web-based cognitive behavioural intervention to infertile women and found overall levels of stress to decrease, but only in the short term. They concluded that web-based approaches may be a suitable platform for treatment due to the benefits of privacy, reduced time, and financial and social implications. If impairment is deemed to be more severe, other traditional therapeutic approaches may be considered more suitable (Sexton et al., 2010b).

Problem-focused interventions. According to McQueeney, Stanton, and Sigmon (1997), problem-focused group interventions aim at providing information and encouraging assertive communication with health professionals and other parties. In their study, McQueeney et al. (1997) concluded that problem-focused interventions did not influence the perception of control but may be beneficial in addressing the controllable aspects of infertility

specifically related to obtaining and making treatment-related decisions, as well as in women recently diagnosed with infertility.

Emotion-focused coping training. Emotion-focused group interventions involve the expression and regulation of emotions, as described by McQueeney et al. (1997). According to these authors, this type of intervention can assist with the uncontrollable aspects of infertility such as accepting the uncontrollable and coping with difficult emotions. They found the intervention did contribute to lower rates of depression and higher rates of infertility-related well-being, although these results only became apparent four weeks following the intervention (McQueeney et al., 1997). Both problem-focused and emotion-focused interventions were found to be useful and may be beneficial at different stages of the infertility (McQueeney et al., 1997).

Mindfulness-based interventions. Li, Long, Liu, He, and Li (2015) developed a six-week mindfulness-based intervention for women undergoing their first in vitro fertilisation treatment. The intervention incorporated mindfulness of thoughts and feelings, focus on the body and psychological aspects of acceptance, letting go and patience. The results revealed higher rates of self-compassion, mindfulness, meaning-based coping and all aspects of the Fertility Quality of Life instrument, which include emotional, cognitive and physical, relation and social aspects. Improvements in emotional regulation were apparent, as well as an increased pregnancy rate and improved sleep – as a result, active and passive-avoidance coping strategies were less frequently used.

Discussion

Aim 1 was to identify coping strategies used by women with either primary or secondary infertility.

The psychological impact of infertility was evident in the review in terms of the prevalence of stress, anxiety, depression, somatisation, negative feelings and level of adjustment of affected women (Aflakseir & Zarei, 2013; Benyamini et al., 2008; Driscoll et al., 2016; Gourounti, 2012; Hansell et al., 1998; Hess et al., 2018; Karaca & Unsal, 2015; Oti-Boadi & Asante, 2017; Ramamurthi et al., 2016; Roudsari & Allan, 2011; Teimourpour et al., 2015). It is therefore clear that the experience of infertility is more than just a temporary setback from important life goals or needs and requires effective coping.

The review has shown that women use coping strategies that can be divided into three subthemes, namely active coping, avoidance coping, and religious and spiritual coping. The use of different coping strategies concurs with research in general (Benyamini et al., 2004; Panagopoulou et al., 2006; Sormunen et al., 2018). It is somewhat surprising, however, that religious and spiritual coping emerged as a common coping strategy compared to active and avoidant coping strategies, which are usually indicated as being more common (Benyamini et al., 2004; Kraaij, Garnefski, & Schroevers, 2009; Panagopoulou et al., 2006; Podolska & Bizan, 2011; Sormunen et al., 2018;). This may be due to the fact that being infertile is experienced as a very personal challenge, and that religion, central to one's self and identity (Oppong, 2013) provides individuals and couples a spiritual resource to tap into.

Four influential factors emerged that influenced selection of coping strategy. It further emerged from the review that, similar to other contexts, coping strategies as a response to infertility may also promote or decrease psychological well-being. In some cases, contradictory findings emerged. Of the three broad strategies, only active and religious/spiritual coping included adaptive outcomes, although both also included, to a lesser extent, some maladaptive outcomes. Avoidance coping included maladaptive outcomes only. Contradictory outcomes were noted for both avoidance and religious/spiritual coping, but not for active coping strategies.

Active coping was particularly adaptive due to the utilisation of cognitive strategies like problem-solving, meaning, and acceptance to decrease stress and to improve well-being. This is not surprising as healthy cognition is strongly associated with adaptive outcomes in the stress and coping literature (Aldao & Nolen-Hoeksema, 2012; Troy, Shallcross, & Mauss, 2013). Although different cognitive theories exist, the common mechanism in adaptive cognitions is the reappraisal of something which is potentially bad into something which is potentially good. From the review, the opposite was also evident – when infertility was appraised as a loss rather than a challenge, avoidance coping strategies like fatalism and wishful thinking were more often used (Hansell et al., 1998). Positive appraisal, in contrast, enables the individual to maintain or develop hope, a more positive future outlook, as well as more effective problem-solving (Cohen-Chen, Crisp, & Halperin, 2017; Heppner & Lee, 2012). From the review it is clear that this is possible even in the context of being infertile – the implication is that it is a valuable coping strategy that needs to be strongly facilitated during counselling.

Active coping methods like emotion regulation and seeking social support also emerged as adaptive – emotion regulation, however, was adaptive only when it involved cognitive control and self-nurturing. The importance emotion plays in experiencing stress is often underestimated, especially when taking into account the strong focus on cognitive strategies in the literature. Emotion is extremely important as it provides the individual with information about the importance and severity of a specific context (Gross, 2013), while it also helps others to understand how one feels in that context (Gross, Halperin, & Porat, 2016). Emotion should therefore not, as evident from the review, be avoided, negatively directed to oneself or be a source of rumination, but rather be regulated – that is, expressed in an appropriate way. For infertile couples, this could be extremely valuable in helping to understand others, and in addition, to elicit social support.

Social coping in the form of seeking and eliciting social support seemed to be a strong adaptive source. Being socially accepted and able to rely on others is a deeply engrained human need, according to Baumeister and Leary (as cited in Caouette & Guyer, 2016). With this being the case, it is no surprise that social support would be a resource when confronted with infertility. None of the studies reported negative outcomes as a result of seeking social support. However, it was noted that participants in the review studies preferred close family and friends, as well as others who experience infertility, as social resources. It is also important to note that avoiding others, often due to the stigma attached to infertility (Remennick, 2000), resulted in some maladaptive outcomes. The implication therefore is that appropriate social skills may play a significant role when confronted with infertility.

Avoidance coping strategies primarily emerged as maladaptive in the review. These strategies involved denial of the reality of being infertile, social avoidance, and passive strategies like hopelessness and wishful thinking. People generally find it difficult to actively engage in managing stressors when they perceive their control over, or ability to effectively deal with the situation as poor (Skinner & Zimmer-Gembeck, 2011). In cases like these, behaviour (including cognitive realisation) is inhibited to protect oneself from the impact of the situation, and to conserve energy for later action – in this regard, inaction may be temporarily adaptive (Maranges & Baumeister, 2016). If the outcome of this inaction does, however, not progress towards some level of acceptance, reappraisal, or engagement with the stressor, it may result in long-term psychopathology.

Finally, religious coping strategies emerged as adaptive specifically when ‘positive’ strategies, i.e. those associated with having a secure bond with a higher entity, were followed, and as maladaptive when ‘negative’ strategies, i.e. a relationship with the sacred that is characterised by conflict and tension, were followed. As religion and spirituality is central to one’s self and identity (Oppong, 2013), it is no surprise that positive religious strategies are

adaptive. The use of prayer as coping mechanism has specifically been indicated by previous research as adaptive (You & Yoo, 2016), while religious communities are known to provide strong social support during a crisis (VanderWeele, 2017). Negative religious strategies are more complicated, as they depend on the specific religion and cultural group in which they are applied. On a certain level, they are, from a psychological viewpoint, difficult to understand or explain as coping mechanisms, as they involve behaviours typically not related to growth or well-being. Another interesting factor is that in the review, some contradiction was noted, as adaptive and maladaptive outcomes were linked to both positive and negative religious coping. This implies that religious coping is complex and needs to be managed effectively by a counsellor.

Aim 2 was to identify and describe psychological interventions used to address primary or secondary infertility. Prior to commencing with psychological treatment, it became apparent that certain factors need to be taken into consideration. Two main influential factors were identified regarding the need for psychological interventions, which were readiness for intervention and the influence of cultural and religious beliefs. The urgency and suitability for treatment can be determined via screening a woman's level of distress, perception of control, personality traits, religious and spiritual beliefs, as well as socio-cultural pressures (Gourounti, 2012; Hess et al., 2018; Karaca & Unsal, 2015; Oti-Boadi & Asante, 2017; Rashidi et al., 2011; Roudsari & Allan, 2011). The type of infertility and duration of infertility should also be considered.

It is not surprising that distress is considered as a screening factor as literature on infertility highlights stress as an expected occurrence with the diagnosis of infertility and is associated with impaired coping, as well as increased levels of stress being associated with longer durations of infertility (Patel et al., 2016). Furthermore, a relationship exists between the perception of control and well-being, with increased well-being associated with a higher

sense of control (Dijkstra & Homan, 2016). Personality traits mediate the responses to stressors (Lazarus & Folkman, 1984) and religious and spiritual beliefs influence the appraisal of a stressor (Aflakseir & Mahidiyar, 2016). Certain societies, especially pronatalist countries, may place more emphasis on fertility and this can result in further distress (Pedro & Andipatin, 2014). The aforementioned implies that the level of stress and perception of control can have a significant impact on the use of maladaptive coping strategies. Personality traits and religion appear to influence the appraisal of the stressor and socio-cultural beliefs added to further distress. All of these implications are indicative of the need for psychological support.

In terms of the type of psychological interventions used, the findings are consistent with literature that indicates that therapeutic counselling can reduce distress, depression, and anxiety associated with infertility (Kharde et al., 2012).

Interventions in the review that addressed infertility stress were CBT and mindfulness-based interventions. Cognitive-based interventions reduced stress in both types of infertility, and both of the reviewed interventions were web-based (Gourounti, 2012; Sexton et al., 2010b). CBT is suggested to be effective due to the focus on identifying and challenging cognitive distortions and negative beliefs, which effectively reduces stress (Pour, 2014; Verkuijden, Verhaak, Nelen, Wilkinson, & Farquhar, 2016) whereas mindfulness teaches skills to view feelings, thoughts and events in a non-judgemental manner (Nery et al., 2018). It is implied that being able to actively address and accept thoughts and feelings associated with infertility may assist infertile women.

Interventions that assisted with emotional aspects were cognitive, emotion and mindfulness-based interventions. Emotion-focused coping training lowered rates of depression in women with primary infertility (McQueeney et al., 1997) and cognitive and mindfulness-based interventions improved emotional regulation, with the mindfulness

intervention specifically improving self-compassion (Hämmerli et al., 2010; Li et al., 2015). Literature on all three of the aforementioned types of interventions is indicative of improvements in depressive symptoms and emotional regulation (Holzel et al., 2011; Masoumi, Parsa, Kalhori, Mohammadi, & Mohagheghi, 2018; Nery et al., 2018; Verkuijlen et al., 2016), and therefore the results are not surprising. Incorporating aspects of emotional regulation into infertility treatments may therefore be beneficial.

Improvements in well-being were evident in resilience-enhancing therapies and emotion-focused coping training specifically in women with primary infertility (Sexton et al., 2010a; McQueeney et al., 1997). Resilience is an important factor in decreasing distress in infertile women as well as preserving different aspects of well-being (Li, Zhang, Shi, Guo, & Wang, 2019). A range of emotions are experienced during the experience of infertility (Domar et al., 2011) and emotion-focused training assists in developing emotional awareness that facilitates change (Soltani, Shairi, Roshan, Rahimi, & Marzieh, 2014). It is therefore implied that improved well-being is an important aspect of psychological treatment.

Perception of control was attended to by problem-focused interventions and emotion-focused coping training. Problem-focused interventions were effective in addressing controllable aspects of primary infertility and were suitable for women recently diagnosed with infertility, whereas emotion-focused coping training addressed the uncontrollable aspects of primary infertility (McQueeney et al., 1997). Perceived control is an important means of coping with a stressor (Skinner & Zimmer-Gembeck, 2011). It is suggested that interventions that develop a greater perception of control are beneficial for infertile women.

Certain interventions increased the use of certain coping strategies. Resilience-enhancing therapies increased the use of active coping strategies in women with primary infertility (Sexton et al., 2010a). Mindfulness-based interventions resulted in more frequent use of meaning-based coping, and less use of active and passive avoidance coping (Li et al.,

2015). Hämmerli et al (2010) further recommended the use of active-confronting coping and meaning-based coping in treatment interventions. Active and meaning-based coping are both adaptive coping strategies and integrating these coping aspects into interventions may be valuable. It was surprising to find that the method of delivery of interventions was commonly web-based – however, if the distress is more severe, other traditional therapeutic approaches may be more suited (Sexton et al., 2010b). This has implications for the mode of delivery of interventions.

In conclusion, psychological interventions should be used at all stages of infertility treatment and utilised by woman experiencing significant distress (Hämmerli et al., 2010). Interventions should facilitate the adaption of coping strategies, allow for emotional expression and increase perception of control (Cousineau & Domar, 2007; Gourounti et al., 2012; Hämmerli et al., 2010). Psychological counselling should be encouraged for not only women but their families as well, especially when women are receiving infertility treatment (Ramamurthi et al., 2016).

Limitations

A few limitations need to be taken into account before any final conclusions can be made. Firstly, only 23 studies met the inclusion criteria, of which only five addressed aim 2 of the study. Secondly, only 13 studies were based in developing countries, with only one South African study being included. Thirdly, only one research engine (EDS) was used and the review did not include studies in languages other than in English or Afrikaans – consequently, not all data and literature on coping strategies and psychological interventions in this regard were obtained. Finally, some important concepts, most notably the *type of infertility* and *coping strategies*, were not always clearly defined or specified in all the studies. Consequently, some interpretations had to be made in this regard. Although these

limitations are usually associated with the limited search strategy used in rapid reviews, results should be carefully interpreted. The conclusion will therefore also be presented in line with the explorative nature of a rapid review in mind.

Recommendations

Based on the findings of the review, as well as the limitations of this study, several recommendations are made. First and foremost, further research needs to be done to better understand the psychological experience of infertility, the way society perceives infertility, and finally the extent to which counselling guidelines need to be tailored for specific cultural contexts. To achieve this, researchers in this field need to clearly define and describe their samples in terms of the type of infertility involved, as well as the coping strategies used. In addition, more mixed-method approaches are needed in order to provide us with more in-depth, comprehensive explanations of infertility and its impact on individuals and couples.

An important gap that still exists seems to be the role culture and religion play in the experience of and coping with infertility, especially in developing countries like South Africa. Religious coping is a sensitive and complex topic and guidelines need to be developed for effective counselling through more in-depth research. More specifically, research needs to focus on ways in which women can be guided to create meaning in a way that would enhance their well-being and avoid guilt and self-blame or any religious understandings that may jeopardise their well-being. It is further recommended that religious leaders should also be counselled regarding the impact infertility has on women's well-being.

Comparative studies need to be done in order to explore whether certain psychological interventions would be more effective and suitable depending on the type of infertility or cause of infertility. From the review it also appears to be important for psychological interventions to aim at integrating different coping strategies like emotion regulation and

social- and stress management skills, in order to facilitate a greater sense of control over the stressor of being infertile. In addition, it appears that therapists should take into consideration a woman's appraisal of infertility, degree of internalisation of stigma, and duration of infertility. Interventions are recommended for use at all stages of infertility treatment and for both women and their families. Web-based approaches to counselling may be beneficial, but further research in this area is required.

Conclusion

The aim of the study was to review the available scientific literature on the coping strategies employed by women with infertility, as well the types of psychological interventions used in addressing their infertility-related difficulties. Infertility is a stressor with important psychological, social, and financial consequences.

The findings of the review indicate that the experience of infertility is a personal challenge that interferes with important life goals or needs and requires effective coping. In confirmation of the general coping literature, active coping was found to be particularly adaptive due to the utilisation of strategies like problem-solving, meaning, and acceptance. Positive reappraisal of infertility seems to enable individuals to maintain or develop hope, a more positive future outlook, as well as a more effective problem-solving approach to their perceived loss. In contrast, appraising infertility only or primarily as a loss elicited avoidance coping strategies like fatalism and wishful thinking, and subsequent risks of developing anxiety, guilt, and depression. Positive religious coping seemed to be adaptive perhaps because it provides individuals and couples with a resource that effectively addresses the personal nature of being infertile and the challenge it poses to one's identity. Social coping was also highly adaptive – being socially accepted and able to rely on others is a deeply

engrained human need, and therefore, it is no surprise that social support would be a resource for women when confronted with infertility.

Although the review provides important information about a woman's readiness for intervention, the influence of cultural and religious beliefs, as well as the use of cognitive, problem-focused, emotion-focused, and mindfulness-based interventions, many questions still remain to be answered. It is therefore recommended that further research needs to be done to better understand the psychological experience of infertility, the way society perceives infertility, and finally the extent to which counselling guidelines need to be tailored for specific cultural contexts. Key aspects have been identified that may improve the effectiveness of psychological interventions for infertile women and thereby improve their ability to cope.

References

- Abbasi, M., Dargahi, S., Jobaneh, R. G., & Mehrjardi, A. A. (2016). Effective of emotional regulation on psychological wellbeing and marital satisfaction of Iranian infertile couples. *Journal of Research & Health, 5*(4), 60–69. Retrieved from <https://jrh.gmu.ac.ir/article-1-733-en.html>
- Aflakseir, A., & Zarei, M. (2013). Association between coping strategies and infertility stress among a group of women with fertility problem in Shirza, Iran. *Journal of Reproduction and Infertility, 14*(4), 202–206. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3911816/>
- Aflakseir, A., & Mahidiyar, M. (2016). The role of religious coping strategies in predicting depression among a sample of women with Fertility Problems in Shiraz. *Journal of Reproductive Infertility, 17*(2), 117–122. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/27141467>
- Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review, 30*, 217–237. doi: 10.1016/j.cpr.2009.11.004.
- Aldao, A., & Nolen-Hoeksema, S. (2012). When are adaptive strategies most predictive of psychopathology? *Journal of Abnormal Psychology, 121*(1), 276281. doi: 10.1037/a0023598
- Almagiá, E. B., & Huespe, M. D. A. (2012). Perceived stress, coping and hardy personality in infertile women. *Liberabit, 19*(1), 113–119. Retrieved from http://revistaliberabit.com/en/revistas/RLI_19_1_perceived-stress-coping-and-hardy-personality-in-infertile-women.pdf

- Amakwe, B. E. (2013). The problem with infertility. *Human Life Review*, 3(2), 89. Retrieved from <https://www.questia.com/magazine/1P3-3055387411/the-problem-of-infertility-in-africa>
- American Society for Reproductive Medicine. (2016). Infertility. Retrieved from <https://www.asrm.org/?vs=1>
- Asemota, O. A., & Klatsky, P. (2015). Access to infertility care in the developing world: The family promotion gap. *Seminars in Reproductive Medicine*, 33(1), 17–22. doi: 10.1055/s-0034-1395274
- Benyamini, Y., Gozlan, M., & Kokia, E. (2004). On the self-regulation of a health threat: cognitions, coping, and emotions among women undergoing treatment for infertility. *Cognitive Therapy and Research*, 28(5), 577–592: doi: 10.1023/B:COTR.0000045566.97966.2
- Benyamini, Y., Gefen-Bardarian, Y., Gozlan, M., Tabiv, G., Shiloh, S., & Kokia, E. (2008). Coping specificity: The case of women coping with infertility treatments. *Psychology and Health Journal*, 23(2), 221–241. doi: 10.1080/14768320601154706
- Berking, M., & Wupperman, P. (2012). Emotion regulation and mental health: recent findings, current challenges, and future directions. *Current Opinion in Psychiatry*, 25, 128–134. doi: 10.1097/YCO.0b013e3283503669
- Bewley, S., Davies, M., & Braude, P. (2005). Which career first? *BMJ*, 331(588). doi: 10.1136/bmj.331.7517.588
- Biggs, A, Brough, P., & Drummond, S. (2017). Lazarus and Folkman’s psychological stress and coping theory. In C. L., Cooper & J. Campbell (Eds.), *The handbook of stress and health: A guide to research and practice* (pp. 351–364). doi: 10.1002/9781118993811

- Brito, J. (2018). A phenomenological analysis on infertility in Mexican women living in the United States. *Interamerican Journal of Psychology*, *52*(1), 129–139. doi: 10.30849/rip/ijp.v52i1.372
- Caouette, J. D., & Guyer, A. E. (2016). Cognitive distortions mediate depression and affective response to social acceptance and rejection. *Journal of Affective Disorders*, *190*(1), 792–799. doi: 10.1016/j.jad.2015.11.015
- Cohen-Chen, S., Crisp, R., & Halperin, E. (2017). A new appraisal-based framework underlying hope in conflict resolution. *Emotion Review*, *9*(3), 208–214. doi: 10.1177/17540703916670023
- Cousineau, T. M., & Domar, A. D. (2007). Psychological impact of infertility. *Best Practice & Research Clinical Obstetrics & Gynaecology*, *21*(2), 293–308. doi: 10.1016/j.bpobgyn.2006.12.003
- Cronkite, R. C., & Moos, R. H. Life context, coping processes, and depression. In E. E. Beckham, & W. R., Leber (Eds.), *Handbook of depression* (pp. 569–587). New York: Guilford Press.
- Dijkstra, M. T., & Homan, A. C. (2016). Engaging in rather than disengaging from stress: Effective coping and perceived control. *Frontiers in Psychology*, *7*(1), doi: 10.3389/fpsyg.2016.01415
- Domar, A. D., Zuttermeister, P. C., & Friedman, R. (1993). The psychological impact of infertility: a comparison with patients with other medical conditions. *Journal of Psychosomatic Obstetrics and Gynaecology*, *14*, 45–52. doi: <https://www.ncbi.nlm.nih.gov/pubmed/8142988>
- Domar, A., Gordon, K., Garcia-Velasco, J., La Marca, A., Barriere, P., & Beligotti, F. (2011). Understanding the perceptions of and emotional barriers to infertility treatment: a

- survey in four European countries. *Human Reproduction*, 27(4), 1073–1079. doi: 0.1093/humrep/des01
- Donkor, S. E., & Sandall, J. (2009). Coping strategies of women seeking infertility treatment in Southern Ghana. *African Journal of Reproductive Health*, 13(4), 81–94. Retrieved from <https://www-jstor-org.nwulib.nwu.ac.za/stable/27802625>
- Driscoll, M. A., Davis, M. C., Aiken, L. S., Yeung, E. W., Sterling, E. W., Vanderhoof, V., ... Nelson, L. M. (2016). Psychosocial vulnerability, resilience resources and coping with infertility: A longitudinal model of adjustment to primary ovarian insufficiency. *Annals of Behavioural Medicine*, 50(2), 272–284. doi: 10.1007/s12160-015-9750-z
- EDS Search. (2018). Retrieved from <http://library.nwu.ac.za/eds-search>
- El Kissi, Y., Romdhane, A. B., Hidar, S., Bannour, S., Idrissi, K. A., Khairi, H., & Hadj, Ali, B. B. (2013). General psychopathology, anxiety, depression and self-esteem in couples undergoing infertility treatment: a comparative study between men and women. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 167(2), 185–189. doi: 10.1016/j.ejogrb.2012.12.014
- Fauerbach, J. A., Lawrence, J. W., Fogel, J., Richter, L., Magyar-Russell, G., McKibben, J. B. A., & McCann, U. (2009). Approach-avoidance coping conflict in a sample of burn patients at risk for posttraumatic stress disorder. *Depression and Anxiety*, 26, 838–850. doi: 10.1002/da.20439
- Folkman, S. (2013). Stress: Appraisal and Coping. In M. D., Gellman & J. R. Turner (Eds.), *Encyclopedia of behavioural medicine* (p. 123). Retrieved from https://link.springer.com/referenceworkentry/10.1007%2F978-1-4419-1005-9_215
- Fouché, J. P., Nortjé, N., Phillips, K., & Stroud, L. (2011). Psychofortology of women undergoing infertility treatment. *Journal of Psychology in Africa*, 21(4), 541–548. doi: 10.1080/14330237.2011.10820495

- Galhardo, A., Cunha, M., & Pinto-Gouveia, J. (2013). Mindfulness-based program for Infertility: efficacy study. *Infertility and Sterility*, *100*(4), 1059–1067. doi: 10.1016/j.fertnstert.2013.05.036
- Ganann, R., Ciliska, D., & Thomas, H. (2010). Expediting systematic reviews: methods and implications of rapid reviews. *Implementation Science*, *5*(56). doi:
- Gerais, A. S., & Rushwan, H. (1992). Infertility in Africa. *Popular Science*, *12*(1), 25–46. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/12319540>
- Gourounti, K., Anagnostopoulos, F., Potamianos, G., Lykeridou, K., Schmidt, L., & Vaslamatzis, G. (2012). Perception of control, coping and psychological stress of infertile women undergoing IVF. *Reproductive BioMedicine Online*, *24*(6), 670–679. doi: 10.1016/j.rbmo.2012.03.002
- Gross, J. J. (2013). Emotion Regulation: Taking stock and moving forward. *Emotion*, *13*(3), 359–365. doi: 10.1037/a0032135
- Gross, J. J., Halperin, E., & Porat, R. (2016). Emotion regulation in intractable conflicts. *Current Directions in Psychological Science*, *22*(6), 423–429. doi: 10.1177/0963721413495871
- Hämmerli, K., Znoj, H., & Berger, T. (2010). What are the issues confronting infertile women? A qualitative and quantitative approach. *The Qualitative Report*, *15*(4), 766–782. Retrieved from <http://www.nova.edu/ssss/QR/QR15-4/hammerli.pdf>
- Hansell, P. L., Thorn, B. E., Pretnic-Dunn, S., & Floyd, D. L. (1998). The relationships of primary appraisals of infertility and other gynecological stressors to coping. *Journal of Clinical Psychology*, *5*(2), 133–145. doi: 10.1023/A:1026238530050
- Hardeep L. J., Rohtash, S., & Rohtash, B. (2009). Psychological distress, coping and subjective wellbeing among infertile women. *Journal of the Indian Academy of Applied*

- Psychology*, 35(2), 329–336. Retrieved from
<http://medind.nic.in/jak/t09/i2/jakt09i2p329.pdf>
- Hasanpoor-Azghydy, S. B., & Simbar, M. (2015). The social consequences of infertility among Iranian women: A qualitative study. *International Journal of Fertility Sterility*, 8(4), 409–240: doi: 10.22074/ijfs.2015.4181
- Heppner, P. P., & Lee, D. G. (2012). Problem-solving appraisal and psychological adjustment. In C. Snyder & S. Lopez (Eds.), *The Oxford handbook of positive psychology* (pp. 288–298). doi: 10.1093/oxfordhb/9780195187243.013.0032
- Hess, R. F., Ross, R., & Gililand Jr, J. L. (2018). Infertility, psychological distress, and coping strategies among women in Mali, West Africa: A mixed-methods study. *African Journal of Reproductive Health*, 22(1), 60–72. doi: 10.29063/ajrh2018/v22i1.6
- Holzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science*, 6(6), 537–559. doi: 10.1177/1745691611419671
- Inhorn, M. C. & Patrizio, P. (2015). Infertility around the globe: new thinking on gender, reproductive technologies and global movements in the 21st century. *Human Reproduction Update*, 21(4), 411–426. doi: 10.1093/humupd/dmv016
- Jones, E. R., & Lopez, K. H. (2013). Chapter 7: Reproductive aging. *Human Reproductive Biology* (pp. 122–126). Retrieved from
<https://books.google.co.za/books?id=M4kEdSnS-pkC>
- Karaca, A., & Unsal, G. (2015). Psychosocial problems and coping strategies among Turkish women with infertility. *Asian Nursing Research*, 9(3), 243–250. doi: 10.1016/j.anr.2015.04.007

- Kharde, S. N, Pattad, S., & Bhogale, G. S. (2012). Effectiveness of a therapeutic counseling intervention for depression, anxiety, self-esteem and marital adjustment among infertile women. *International Journal of Nursing Education*, 4(2), 151–154. Retrieved from sciedu.ca/journal/index.php/jnep/article/download/6122/4088
- Kraaij, V., Garnefski, N., & Schroevers, M. J. (2009). Coping, goal adjustment, and positive and negative affect in definitive infertility. *Journal of Health Psychology*, 14(8), 18–25. doi: 10.1177/1359105308097939
- Lazarus, R. S., & Folkman, S. (1984). The coping process: An alternative to traditional formulations. *Stress, Appraisal, and Coping* (pp. 141–178). New York, NY: Springer.
- Li, J., Long, L., Liu, L., He, W., & Li, M. (2015). Effects of a mindfulness-based intervention on fertility quality of life and pregnancy rates among women subjected to first in vitro fertilization treatment. *Behaviour Research and Therapy*, 77(2016), 96–104. doi: 10.1016/j.brat.2015.12.010
- Li, Y., Zhang, Shi, X., Guo, S., & Wang, L. (2019). Resilience acts as a moderator in the relationship between infertility-related stress and fertility quality of life among women with infertility: a cross-sectional study. *Health and Quality of Life Outcomes*, 17(1), 1–9. doi:10.1186/s12955-019-1099-8
- Luk, B. H., & Loke, A. Y. (2016). A review of supportive interventions targeting Individuals or couples undergoing infertility treatment: Directions for the development of interventions. *Journal of Sex & Marital Therapy*, 42(6), 515–533. doi: 10.1080/0092623X.2015.1074133
- Maranges, H. M., & Baumeister, R. F. (2016) Self-Control and Ego Depletion. In R.F. Baumeister & K. D., Vohs (Eds.), *Handbook of self-regulation. research, theory, and applications* (pp.42–61). New York: The Guilford Press.

- Mascarenhas, M. N., Flaxman, S. R., Boerma, T., Vanderpoel, S., & Stevens, A. S. (2012). National, regional, and global trends in infertility prevalence since 1990: A systematic analysis of 277 Health Surveys. *PLoS Medicine*, *9*(12), 1–12. doi: 10.1371/journal.pmed.1001356.
- Masoumi, S. Z., Parsa, P., Kalhori, F., Mohammadi, Y., & Mohagheghi, H. (2018). The effect of psychosocial interventions on anxiety and depression in infertile women and men in assisted reproductive treatment: a systematic review. *Journal of Psychology and Clinical Psychology*, *9*(5), 494–500. doi: 10.15406/jpcpy.2018.09.00579
- McQueeney, D. A., Stanton, A. L., & Sigmon, S. (1997). Efficacy of emotion-focused and problem-focused group therapies for women with fertility problems. *Journal of Behavioural Medicine*, *20*(4), 313–331. doi: 10.1023/A:1025560912766
- Meczekalski, B., Czyzyk, A., Kunicki, M., Podfigurna-Stopa, A., Plociennik, L., Jakiel, G., & Lukaszuk, K. (2016). Fertility in women of late reproductive age: the role of serum anti-Müllerian hormone (AMH) levels in its assessment. *Journal of Endocrinological Investigation*, *39*(11), 1267. doi: 10.1007/s40618-016-0513-x
- Nery, S. F., Paiva, S. P. C., Vieira, E. L., Barbosa, A. B., Sant'Anna, E. M., Casalechi, M., ... Resi, F. M. (2018). Mindfulness-based program for stress reduction in infertile women: Randomized controlled trial. *Stress and Health*, *35*(1), 49–58. doi: 10.1002/smi.2839
- Oppong, S. H. (2013). Religion and identity. *American International Journal of Contemporary Research*, *3*(6), 10–16. Retrieved from https://aijcrnet.com/journals/Vol_3_No_6_June_2013/2.pdf
- Oti-Boadi, M., & Asante, K. O. (2017). Psychological health and religious coping of Ghanaian women with infertility. *BioPsychoSocial Medicine*, *11*(20), 1–7. doi: 10.1186/s13030-017-0105-9

- Panagopoulou E., Vedhara, K., Gaintarzi, C., & Tarlatzis, B. (2006). Emotionally expressive coping reduces pregnancy rates in patients undergoing in vitro fertilization. *Fertility and Sterility*, *86*(3), 672–677. doi: 10.1016/j.fertnstert.2006.02.096
- Patel, A., Sharma, P. S., Narayan, P., Binu, V. S., Dinesh, N., & Pai, P. J. (2016). Prevalence and predictors of infertility-specific stress in women diagnosed with primary infertility: A clinic-based study. *Journal of Human Reproductive Sciences*, *9*(1), 28–34. doi: 10.4103/0974-1208.178630
- Pedro, A., & Andipatin, M. (2014). A qualitative exploration of South African women's psychological and emotional experiences of infertility. *Journal of Preventive Medicine*, *4*(1), 327–337. doi: 10.4236/ojpm.2014.45040
- Penley, J. A., Tomaka, J., & Wiebe, J. S. (2002). The association of coping to physical and psychological health outcomes: A meta-analytic review. *Journal of Behavioral Medicine*, *6*(1), 551–603. doi: 10.1023/a:1020641400589
- Polis, C. B., Cox, C. M., Tunçalp, O., McLain, A. C., & Thoma, M. E. (2017). Estimating infertility prevalence in low-to-middle-income countries: an application of a current duration approach to Demographic and Health Survey data. *Human Reproduction*, *32*(5), 1064–1074. doi: 10.1093/humrep/dex025
- Pour, T. H. (2014). The effect of cognitive behavioural therapy on anxiety in infertile women. *European Journal of Experimental Biology*, *4*(1), 415–419. Retrieved from <https://pdfs.semanticscholar.org/d0e7/34e6645b3c86e5bd422548745ae957e2c10c.pdf>
- Ramamurthi, R., Kavitha, G., Pounraj, D., & Rajarajeswari, S. (2016). Psychological impact and coping strategies among women with infertility – A hospital based cross sectional study. *International Archives of Integrated Medicine*, *3*(2), 114–118. Retrieved from https://iaimjournal.com/wp-content/uploads/2016/02/iaim_2016_0302_17.pdf

- Rapoport-Hubschman, N., Gidron, Y., Reicher-Atir, R., Sapir, O., & Fisch, B. (2009). “Letting go” coping is associated with successful IVF treatment outcome. *Fertility and Sterility*, 92(4), 1384–1388. doi: 10.1016/j.fertnstert.2008.08.012
- Rashidi, B., Hosseini, S., Beigi, P., Ghazizadeh, M., & Farahani, M. N. (2011). Infertility stress: The role of coping strategies, personality trait, and social support. *Journal of Family and Reproductive Health*, 5(1), 101–108. Retrieved from https://www.researchgate.net/publication/278221837_Infertility_Stress_The_Role_of_Coping_Strategies_Personality_Trait_and_Social_Support
- Remennick, L. (2000). Childless in the land of imperative motherhood: Stigma and coping among infertile Israeli women. *Sex roles*, 43(11), 821–839. doi: 10.1023/A:1011084821700
- Rouchou, B. (2013). Consequences of infertility in developing countries. *Perspectives in public health*, 133(3), 174–178. doi: 10.1177/1757913912472415
- Roudsari, R. L., & Allan, H. T. (2011). Women’s experience and preferences in relation to infertility counselling: A multifaith dialogue. *International Journal of Fertility and Sterility*, 6(3), 168–187. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/25101160>
- Rutstein, S. O., & Shah, I. H. (2004). Infecundity, infertility, and childlessness in developing countries (DHS Comparative Reports No.9). Retrieved from www.who.int/reproductivehealth/topics/infertility/DHS-CR9.pdf
- Schmidt, L., Christensen, U., Holstein, B. E. (2005). The social epidemiology of coping with infertility. *Human Reproduction*, 20(4), 1044–1052. doi: 10.1093/humrep/deh687
- Schünemann, H. J., & Moja, L. (2015). Reviews: Rapid! Rapid! Rapid! ...and systematic. *Systematic Reviews*, 4(1). doi: 10.1186/2046-4053-4-4.

- Sembuya, R. 2010. Mother or nothing: the agony of infertility. *Bulletin World Health Organisation*, 88(12), 881–882. doi: 10.2471/BLT.10.011210
- Sexton, M. B., Bryd, M. R., & von Kluge, S. (2010a). Measuring resilience in women experiencing infertility using the CD-RISC: Examining infertility-related stress, general distress, and coping styles. *Journal of Psychiatric Research*, 44(4), 236–241. doi: 10.1016/j.jpsychires.2009.06.007
- Sexton, M. B., Byrd, M. R., O'Donohue, W. T., & Jacobs, N. J. (2010b). Web-based treatment for infertility-related psychological distress. *Archive of Women's Mental Health*, 13(4), 347–358. doi: 10.1007/s00737-009-0142-x
- Skinner, E. A., & Zimmer-Gembeck, M. J. (2011). Perceived control and the development of coping. In S., Folkman (Ed.), *The Oxford handbook of stress, health and coping* (pp. 35–59). Retrieved from <https://psycnet.apa.org/record/2010-25086-003>
- Soltani, M., Shairi, M. R., Roshan, R., & Rahimi, C. R. (2014). The impact of emotionally focused therapy on emotional distress in infertile couples. *International journal of fertility & sterility*, 7(4), 337–344. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3901179/pdf/Int-J-Fertil-steril-7-337.pdf>
- Sormunen, T., Aanesen, A., Fossum, B., Karlgren, K., & Westerbotn, M. (2018). Infertility-related communication and coping strategies among women affected by primary or secondary infertility. *Journal of Clinical Nursing*, 27, 335–344. doi: 10.1111/jocn.139531080/0092623X.2015.1074133
- South Africa Demographic and Health Survey. (2016). Fertility (Research Report No. 03-00-09). Retrieved from <https://dhsprogram.com/publications/publication-PR84-Preliminary-Reports-Key-Indicators-Reports.cfm>

- Teimourpour, N., Besharat, M. A., Rahiminezhad, A., Rashidi, B. H., & Lavasani, M. G. (2015). The mediational role of cognitive emotion regulation strategies in the relationship of ego-strength and adjustment to infertility in women. *Journal of Family and Reproductive Health, 9*(2), 45–50.
- The Joanna Briggs Institute. (2014). *The Joanna Briggs Institute reviewers' manual: 2014 edition*. Adelaide, Australia: The Joanna Briggs Institute.
- Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology, 8*(45). doi: 10.1186/1471-2288-8-45
- Thomas, J., O'Mara-Eves, A., Kneale, D., & Shemilt, I. (2017). Synthesis methods for combining and configuring textual or mixed methods data. In D. Gough, S. Oliver & J. Thomas (Eds.), *An introduction to systematic reviews* (pp. 182–209). London: Sage.
- Tobin, D. L, Holroyd, K. A., Reynolds, R. V. C., & Wigal, J. K. (1989). The hierarchical factor structure of the Coping Strategies Inventory. *Cognitive Therapy and Research, 13*(4), 343–361. Retrieved from <https://link.springer.com/article/10.1007/BF01173478>
- Troy, A. S., Shallcross, A. J., & Mauss, I. B. (2013). A person-by-situation approach to emotion regulation: Cognitive reappraisal can either help or hurt, depending on the context. *Psychological Science, 24*(12), 2505–2514. doi: 10.1177/0956797613496434
- United Nations. (2015). World Fertility Patterns 2015. Retrieved from <http://www.un.org/en/development/desa/population/publications/pdf/fertility/world-fertility-patterns-2015>
- VanderWeele, T. J. (2017). Religious communities and human flourishing. *Current Directions in Psychological Science, 26*(5), 476–481. doi: 10.1177/0963721417721526

- Verkuijlen, J., Verhaak, C., Nelen, W. L. D. M., Wilkinson, J., & Farquhar, C. (2016). Psychological and educational interventions for subfertile men and women. *Cochrane Database of Systematic Reviews*, 3(1), 1–96. doi: 10.1002 /14651858.CD011034.pub2
- Wager, E., & Wiffin, P. J. (2011). Ethical issues in preparing and publishing systematic reviews. *Journal of Evidence-based Medicine*, 4(2), 130–134. doi 10.1111/j.1756-5391.2011.01122.x
- Watt, A., Cameron, A., Sturm, L., Lathlean, T., Babidge, W., Blamey, S., ... Maddern, G. (2008). Rapid reviews versus full systematic reviews: an inventory of current methods and practice in health technology assessment. *International Journal of Technology Assessment in Health Care*, 24(3), 133–139. doi: 10.1017/S0266462308080185.
- Wong, P. T. P., & Wong, L. C. J. (2006). Beyond stress and coping: The positive psychology of transformation. *Handbook of multicultural perspectives on stress and coping* (pp.1 - 5). Retrieved from <https://download.e-bookshelf.de/download/0000/0006/16/L-G-0000000616-0002368737.pdf>
- You, S., & Yoo, J. E. (2016). Prayer and subjective well-being: The moderating role of religious support. *Archive for the Psychology of Religion*, 38(3), 301–315. doi: 10.1163/15736121-12341328
- Zeidner, M., & Endler, N. S. (1996). *Handbook of coping: Theory, research, applications*. New York: Wiley.

Chapter 3: A Brief Critical Reflection

This chapter provides a brief critical reflection on my research process. I became curious about the topic of infertility when I began noticing an increasing frequency of women in my social circle struggling to either fall pregnant for the first time or to have a second child. Through these interactions I began to hear the personal struggles these women were faced with, especially regarding their definition of womanhood. Their unrelenting desire to have a child seemed to evoke stress that not only affected them individually, but also placed strain on their relationship with their partner both emotionally and financially. I began to become familiar with the different infertility treatment terms and the gruelling process that followed in an attempt to conceive a child. On a personal level, I was left with thoughts of firstly, how would I feel or cope with such a stressor and secondly, how would I assist an individual in therapy to come to terms with the challenges, especially within the South African context. This then motivated me to pursue the phenomenon as a research topic.

The research process was initially overwhelming and daunting, especially as I was not familiar with the research methodology of a rapid review and the literature of coping. This was also against the backdrop of trying to meet the demands and challenges of completing my internship as an intern clinical psychologist at Sterkfontein Psychiatric Hospital. I often found myself thinking that there was just not enough time in a day. The journey towards the completion of my mini-dissertation has been challenging and filled with a range of emotions. It has tested my capabilities as a researcher, but overall has been a knowledge enriching and fulfilling process that was made easier by the continuous guidance, dedication and patience of my research supervisor.

Whilst initially exploring past literature on the topic of infertility it became apparent that two distinct forms of infertility existed, primarily primary and secondary infertility. The prevalence of infertility was also more prominent than I expected. On a continent such as

Africa where there is generally an ever-increasing growth rate in the population, it was surprising to find that the challenges of infertility were still pressing. It became apparent that women in developing countries could face some different challenges in terms of coping with infecundity in comparison to women in developed countries. The marginalisation of reproductive health in addition to limitations in reproductive health services posed a further obstacle.

Women are affected on multiple levels by the stressor of infertility and this presents psychologically, physically, socially, and financially. Despite both sexes having similar rates of infertility, women are still deemed responsible due to the associated expectations of women bearing children and their bodies being of central focus in infertility treatments. This inevitably makes them predisposed to the stressor.

As the research process began to unfold, numerous studies emerged regarding the impact of infertility and the associated coping strategies in women. However, none seemed to provide a synthesis of findings or differentiate between the different types of infertility. A further need materialised in terms of what psychological interventions could be used to effectively address the stressor. These therefore became the aims of my rapid review.

The methodological stage of the review was an exhaustive process, especially as 307 studies were identified from the initial online search. The critical appraisal process took much longer than I anticipated, but following the guidelines of the JBI allowed for this stage to be facilitated in a rigorous and transparent manner. Once the themes began to emerge, the study became more intriguing. The writing up of the results and discussion chapters highlighted to me the variety and complexities of coping with infertility and the need for psychological intervention in this regard.

The synthesis of this review study could be used as a starting point to inform appropriate psychological treatment for women experiencing infertility, whilst promoting the

use of the most effective coping strategies. However, the numerous recommendations that emerged from the review further highlight the importance of further research in the field of women coping with infertility, specifically in a South African context.