

REVIEW ARTICLE

Holistic management of female infertility: A systematic review

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Abstract

Although issues pertaining to infertility affect both males and females, women often become victims of stigmatization and rejection, making them susceptible to emotional pain and suffering. Due to these psychosocial problems, they require not only biomedical treatment, but also psychological, social, and spiritual support. Unfortunately, many women with infertility are not treated holistically. The aim of this review was to retrieve existing evidence of holistic healthcare interventions for women with infertility. Global databases were searched for articles published anywhere in the world between 2010 to 2018 that explored holistic healthcare interventions for women diagnosed with infertility. A total of 18 articles meeting the inclusion criteria were assessed, and data extraction was performed. Findings revealed that interventions adopted in managing infertile women alongside the bio-medical management included: counseling; cognitive behavioral therapy; acceptance and commitment therapy; educational interventions; spiritual interventions; emotionally focused therapy/intervention and integrative body-mind-spirit interventions. The results of this review have implications for healthcare professionals to ensure holistic care of women diagnosed with infertility in Ghana and Africa at large. (*Afr J Reprod Health* 2021; 25[2]: 150-161).

Keywords: Holistic interventions, psychosocial interventions, healthcare interventions, infertility, women

Résumé

Bien que les problèmes liés à l'infertilité touchent à la fois les hommes et les femmes, les femmes sont souvent victimes de stigmatisation et de rejet, ce qui les rend vulnérables à la douleur et à la souffrance émotionnelles. En raison de ces problèmes psychosociaux, ils nécessitent non seulement un traitement biomédical, mais aussi un soutien psychologique, social et spirituel. Malheureusement, de nombreuses femmes souffrant d'infertilité ne sont pas traitées de manière holistique. Le but de cette revue était de récupérer les preuves existantes d'interventions de soins de santé holistiques pour les femmes souffrant d'infertilité. Les bases de données mondiales ont été recherchées pour des articles publiés partout dans le monde entre 2010 et 2018 qui exploraient les interventions de santé holistiques pour les femmes diagnostiquées d'infertilité. Au total, 18 articles répondant aux critères d'inclusion ont été évalués et l'extraction des données a été effectuée. Les résultats ont révélé que les interventions adoptées dans la prise en charge des femmes stériles parallèlement à la prise en charge biomédicale comprenaient: le conseil; thérapie cognitivo-comportementale; thérapie d'acceptation et d'engagement; interventions éducatives; interventions spirituelles; thérapie / intervention centrée sur les émotions et interventions intégratives corps-esprit-esprit. Les résultats de cette revue ont des implications pour les professionnels de la santé afin d'assurer des soins holistiques aux femmes diagnostiquées d'infertilité au Ghana et en Afrique en général. (*Afr J Reprod Health* 2021; 25[2]: 150-161).

Mots-clés: Interventions holistiques, interventions psychosociales, interventions de santé, infertilité, femmes

Introduction

For many women all over the world, infertility constitutes a bio-psychosocial disruption and one of the most upsetting life crises that they encounter. The World Health Organization¹ has ranked infertility in both men and women as a public health issue¹. Despite the disruption caused by infertility and the great success in improving maternal and child health in the past few decades, issues of

infertility and its related psychosocial problems are often neglected². This has contributed to the development of both mental and other healthcare problems in those affected³.

Infertility is a failure or inability to achieve a successful pregnancy after one or more years of unprotected, regular sexual intercourse without the use of contraceptives⁴. Infertility is classified into 'primary infertility' and 'secondary infertility'⁵. Primary infertility is considered as having never

conceived after a year or more of unprotected regular sex without the use of contraceptives. Secondary infertility is referred to as having conceived before, regardless of the final outcome, but now having difficulty conceiving again⁵. This article reviews global publications on holistic healthcare for women with infertility. The findings of the review informed a bigger study aimed at developing guidelines for holistic healthcare of women in Ghana with primary or secondary infertility.

Based on a humanistic and holistic philosophy, holistic healthcare addresses the physical, psychological, social, and spiritual needs of the person. In addition, holistic healthcare emphasizes the partnership between the healthcare practitioner and the patient and the negotiation of healthcare needs that lead to recovery⁶. The first author, a professional nurse at a health care facility in Ghana, observed that the psychosocial and spiritual needs of women diagnosed with infertility were neglected, therefore this review focus on holistic healthcare interventions other than biomedical interventions for infertility.

Global infertility prevalence is approximately 13% among women⁷. The prevalence of infertility in Africa shows variation because some studies were not well-designed, however data from 27 African countries reported prevalence rates of between 11 and 20%⁸. Patriarchy and pro-natalism, major features in most African cultures, contribute to women's experiences of being stigmatised related to their infertility. Women are often blamed for infertility and suffer the psychological and social burden⁸. Due to the importance attached to parenthood, infertility is a major cause of depression, frustration, anxiety, social isolation, suicidal ideations, threats from partners and partners' family, stigmatization, rejection, abandonment, divorce and marital instability to the point of physical violence⁹⁻¹⁴. Stigmatization and rejection from the community may take the form of gossiping, pressure from society, and mockery to the extent of calling women without children in their old age witches. In some African societies women may be excluded or forbidden from engaging in social activities; or blamed when issues of childlessness arise⁹⁻¹⁴. The emotional impact is more

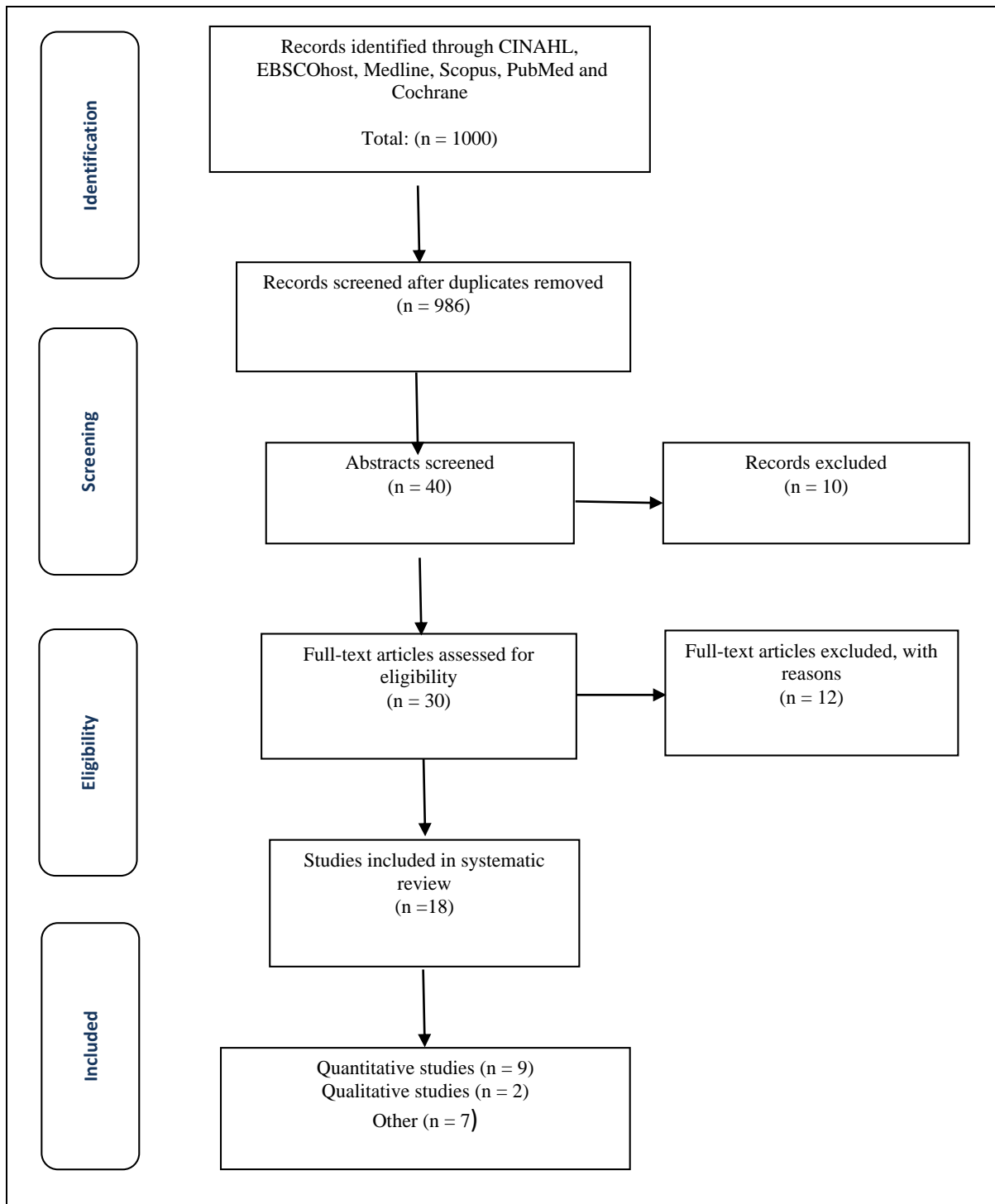
significant when treatment does not result in a clinical pregnancy or a live birth^{15,16}.

Despite all the psychosocial consequences associated with infertility and the need to address them, holistic care is not readily available to women diagnosed with infertility¹⁷⁻¹⁹. Women are mostly managed bio-medically, especially in some African countries, where the psychosocial management of couples with infertility are almost non-existent¹⁷⁻¹⁹. Without psychological support fertility treatment may exacerbate the burden these women already suffer, as it poses additional physical, social and financial challenges²⁰. Health care providers need to assess the general and psychological health of women with infertility and provide holistic care that incorporates physical, spiritual, psychological, and social dimensions²¹. There is a need for a critical review of the literature to explore existing evidence on holistic healthcare interventions that may be used in the management of women with infertility in Ghana.

Methods

The purpose of this systematic review was to review existing evidence of various holistic healthcare interventions for women with infertility. The first author and a librarian searched for relevant studies published globally in English between the year 2010 to 2018 using the electronic databases EBSCOhost, Cochrane, Medical Literature Analysis and Retrieval System Online (MEDLINE), Pro Quest, Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed and Scopus. The review was limited to 2010-2018 because the researchers wanted articles that were within a recent time frame. The following keywords were used in the search: ['holistic' OR 'psychosocial'] AND ['healthcare' OR 'intervention*' OR 'treatment*'] AND 'infertil*' AND 'women'. The search yielded 1000 articles. Figure 1 provides a summary of the search and the inclusion and exclusion process.

After the first screening of the records, based on the inclusion criteria, 44 articles were retrieved that seemed to be related to the study. Subsequently, the first two authors critically examined the abstracts of the remaining studies to ascertain if they met the inclusion criteria.



*Adapted from the 2009 PRISMA Flow diagram

Figure 1: PRISMA flow diagram describing the article inclusion process of the systematic literature review

Table 1: Quality appraisal of articles included for review

Author(s) Year Country	Purpose	Design and method	Quality appraisal Quality appraisal criteria (scale: 3 = high, 2 = moderate, 1 = low)
Kamel (2010) Saudi Arabia	To provide healthcare professionals with an evidence-based management protocol for infertile couples.	Comprehensive review of literature	(3) Purpose of the study (3) Research design (1) Theoretical framework (3) Study conclusion (1) Limitation of the study (2) Study implications Total score: 13 = moderate
Van den Broeck <i>et al</i> (2010) Germany	To describe common interventions used in infertility counselling for individuals, couples and in group settings.	Intervention study and description of theoretical background	(3) Purpose of the study (1) Research design (3) Explicit theoretical framework (3) Study conclusion (1) Limitation of the study (3) Study implications Total score: 14 = moderate
Yazdani <i>et al</i> (2017) Iran	To describe supportive counselling interventions to decrease infertile women's perceived stress.	Systematic review	(3) Purpose of the study (1) Research design (1) Theoretical framework (3) Study conclusion (1) Limitation of the study (2) Study implications Total score: 11 = moderate
Jafarzadeh-Kenarsari <i>et al</i> (2015) Iran	To explore infertile couples' counselling needs.	Qualitative design	(3) Purpose of the study (3) Research design (1) Theoretical framework (3) Study conclusion (1) Limitation of the study (1) Study implications Total score: 12 = moderate
Verkuijlen <i>et al</i> (2014) Netherlands	To assess the efficacy and safety of psychological and educational interventions for sub fertile patients.	Review of published and unpublished randomised controlled trials	(3) Purpose of the study (2) Research design (1) Theoretical framework (3) Study conclusion (3) Limitation of the study (3) Study implications Total score: 15 = high
Luk & Lok (2016) China	To explore the types of psychosocial approaches used in existing interventions for infertile individuals or couples.	Systematic review	(3) Purpose of the study (3) Research design (1) Theoretical framework (3) Study conclusion (3) Limitation of the study (2) Study implications Total score: 15 = high
Faramarzi <i>et al</i> Iran (2013)	To evaluate the effectiveness of cognitive behavioural therapy along with fluoxetine for improvement of infertility stress in infertile women.	Quantitative randomized clinical control trial	(3) Purpose of the study (3) Research design (1) Theoretical framework (3) Study conclusion (3) Limitation of the study (2) Study implications Total score: 15 = high
Batool <i>et al</i> (2013) UK & Pakistan	To assess the impact of emotional intelligence, social support, and contextual factors on the general health of women with infertility.	Quantitative design	(3) Purpose of the study (3) Research design (1) Theoretical framework (3) Study conclusion (3) Limitation of the study (2) Study implications

Frederiksen <i>et al</i> (2015) Denmark	To evaluate the efficacy of psychosocial interventions for improving pregnancy rate and reducing distress in treatment.	Systematic review	Total score: 15 = moderate (3) Purpose of the study (3) Research design (1) Theoretical framework (3) Conclusion stated (3) Limitation of the study (3) Study implications Total score: 16 = high
Gardi (2014) Iraq	To determine the effect of psychological intervention on the rate of marital satisfaction of infertile couples.	Quantitative design	(3) Purpose of the study (3) Research design (1) Theoretical framework (3) Study conclusion (3) Limitation of the study (2) Study implications Total score: 15 = high
Psaros <i>et al</i> (2014) USA	To evaluate the feasibility of a 10-week mind-body intervention for women coping with fertility challenges.	Quantitative design	(3) Purpose of the study (3) Research design (1) Theoretical framework (3) Study conclusion (3) Limitation of the study (2) Study implications Total score: 15 = high
Ying <i>et al</i> (2016) China	To examine the effects of psychosocial interventions on the mental health pregnancy rate and marital function of infertile couples undergoing in vitro.	Systematic review	(3) Purpose of the study (3) Research design (1) Theoretical framework (3) Study conclusion (3) Limitation of study (3) Study implications Total score: 14 = moderate
Collins <i>et al</i> (2018) USA	To examine the utilization of prayer and clergy counselling for women with infertility desiring pregnancy.	Quantitative design	(3) Purpose of the study (3) Research design (1) Theoretical framework (3) Study conclusion (3) Limitation of the study (2) Study implications Total score: 15 = high
Slauson-Blevins <i>et al</i> 2013 USA	To examine online information seeking among infertile women.	Quantitative design	(3) Purpose of the study (3) Research design (3) Theoretical framework (3) Study conclusion (3) Limitation of the study (3) Study implications Total score: 18 = high
Soltani <i>et al</i> (2014) Iran	To investigate the effect of emotionally focused therapy on factors contributing to emotional distress among couples with infertility.	Quantitative experimental study	(3) Purpose of the study (3) Research design (1) No theoretical framework (3) Study conclusion (3) Limitation of the study (2) Study implications Total score: 15 = high
Chan <i>et al</i> (2012) China	To examine the efficacy of a group intervention, the Integrative Body-Mind-Spirit. intervention which aims at improving the psychosocial and spiritual well-being of infertile women.	Quantitative design	(3) Purpose of the study (3) Research design (1) Theoretical framework (3) Study conclusion (3) Limitation of the study (2) Study implications Total score: 15 = high
Klitzman (2018) USA	To explore how clinicians and patients perceive, experience, and make decisions concerning several	Qualitative design	(3) Purpose of the study (3) Research design (2) Theoretical framework

	critical aspects of infertility treatments.		(3) Study conclusion (3) Limitation of the study (3) Study implications Total score: 17 = high
Alijanpoor <i>et al</i> (2016) Iran	To determine the relationship between spiritual well-being and life satisfaction in females with infertility.	Quantitative design	(3) Purpose of the study (3) Research design (1) Theoretical framework (3) Study conclusion (2) Limitation of the study (2) Study implications Total score: 14 = moderate

The authors resolved disagreements through a consensus discussion. Results were downloaded and stored in the reference database program EndNote X7. Of the 44 articles retrieved from the various electronic data bases, 14 were found to be duplicates, whereas ten articles were found to be irrelevant to the study area.

Inclusion and exclusion criteria

Articles written in English, published between 2010 and 2018 in peer-reviewed journals that presented qualitative or quantitative findings, were included. In addition, the studies had to focus on women diagnosed with infertility and the interventions adopted in addition to the biomedical approach, to ensure holistic care. Dissertations, editorials and book chapters were excluded as the authors wanted to include interventions based on peer reviewed empirical research and theoretical reports. Research on psychosocial interventions published in other languages was also excluded. The results of the systematic review yielded different interventions that have been adapted and practiced in different settings. A total of 18 full text studies were retrieved for detailed evaluation.

Quality assessment and appraisal

The final 18 selected publications consisted of reviews, empirical reports, and one intervention study. All publications were tabulated according to author(s), years, countries, purpose, design and method and quality appraisal. Due to the diverse representation of sources, six criteria evaluating methodological quality were modified and used to evaluate the selected publications²²⁻²⁴. The publications were evaluated in six quality domains on a three-point scale as 'high' = 3, 'moderate' = 2 or 'low' = 1. The process of quality assessment and

appraisal is illustrated in Table 1. All studies scored between 18 and 11 (high to moderate) and were included in the review. Studies without a theoretical framework were not excluded from the review, as it was not applicable for all studies.

Data analysis

The selected manuscripts were read by the first two authors and sections marked indicating holistic healthcare interventions in the treatment of infertility. The sections were categorized according to the different interventions (themes) and summarized. Each section explains the treatment option; the way it is applied in practice as well as the outcomes.

Results

The results are discussed in terms of the different psychosocial and spiritual interventions used in the treatment of women with infertility, and the perceived effects of these interventions on couples and women. The number of studies associated with each intervention is indicated in brackets. The interventions include counseling (5), cognitive behavioral therapy (4), acceptance commitment therapy (2), mind body intervention (2), educational interventions (3), spiritual interventions (3), emotionally focused therapy (2) and integrative body-mind-spirit interventions (1).

Counseling

Findings of most studies on the impact of counseling on the wellbeing of those diagnosed with infertility or burdened with the stressors of infertility, revealed that counseling gives relief from undesirable psychosocial consequences; and offers the chance to explore, discover and clarify ways of living more

satisfyingly and resourcefully^{25,29}. The content of counseling depends on the needs of the couple, but usually involves treatment implication counselling, emotional support counselling, and therapeutic counselling²⁶. This particular publication²⁶ included couples with either male or female infertility. Poorer health in women with infertility was associated with lower scores on emotional intelligence, perceived support, emotional satisfaction, satisfaction with medical information and satisfaction with emotional support²⁷. Thus, counselling should focus on enhancing aspects of emotional intelligence and support.

A qualitative study conducted in Iran²⁸ revealed that couples needed psychological counseling which should focus on emotional distress management, sexual counseling, marital counseling, and family counseling. A limitation to be mentioned is that this study²⁸ did not specify whether the couples were affected by male or female infertility. The couples expressed a need for guidance and information throughout the treatment process and emphasized the importance of treatment counseling, financial counseling, and legal counseling.

Van den Broeck *et al.*²⁹ emphasized that counseling before, during and after infertility treatment should be accessible. Depending on the availability of resources, individual, couple or group-based counselling may be offered. During individual counseling concerns related to the experience and treatment of infertility can be expressed and clarified. These include issues pertaining to self-esteem, body-image, social responses and emotional experiences. Couple counseling offers couples the opportunity to explore relationship patterns and communication, strengthen mutual support, and understand each other's experiences of infertility. Group work enhances emotional expression, interpersonal learning, and development of coping skills²⁹.

Cognitive behavioral therapy

Cognitive behavioral therapy is the most common psychosocial intervention. It helps to reduce psychological distress and infertility-induced stress, improves pregnancy rates and decreases fertility stress (due to social, sexual, and marital concerns), improves focus, while not necessarily always focus

on the need for a child. It also improved sexual activities and satisfaction as well as marital relationship skills³⁰⁻³³.

An Iranian study found that cognitive behavioral therapy was not only a reliable alternative to pharmacotherapy, but also superior to fluoxetine in resolving and reducing infertility stress in women³³. Cognitive-behavioral therapy, as applied in this study, included recognition of negative thinking to help the couples with infertility change their cognitive structure. For example, the woman may believe that she will never be able to have a child. During therapy, this negative pattern was changed to focus on what the woman is doing to have a child of her own. Examples of behavioral techniques included physical activity, muscle relaxation exercises, imagination exercises, expressing feelings, a balanced diet, and constructive use of free time³³.

Acceptance commitment therapy

Acceptance commitment therapy aims at helping patients accept what is out of their control and commit to actions that can improve and enrich their lives. Two studies^{31,34} examined the effectiveness of treating infertility stress using acceptance and commitment therapy. The findings revealed that acceptance commitment therapy is a promising new behavior therapy that targets avoidance through mindfulness, acceptance strategies, and value-directed action. In addition, acceptance commitment therapy shows promise in treating infertility stress in patients experiencing infertility stressors, while it also has the potential to produce lasting change^{31,34}.

Mind body intervention

Mind body intervention is a form of psychotherapy based on the communication between the mind and body, while it also focuses on powerful ways in which the emotional, mental, social, and spiritual factors directly affect health. According to Psaros *et al.*³⁵ and Ying *et al.*³⁶, mind body intervention results in a significant increase in perceived social support and a decrease in depressive symptoms and perceived stress, as well as being effective in relieving psychosocial stressors^{35,36}. The mind body intervention also reduces distress, whereas it improves pregnancy outcomes³⁰.

Educational interventions

Educational interventions, also referred to as psychoeducation, focus on the provision of information about the medical treatment and the reciprocal influence between the person's physical and psychological status³⁷. In general, educational interventions improve psychosocial distress by helping women acquire more knowledge and skills in dealing with infertility and its related issues (self-management and self-efficacy). They may also experience a reduced psychological burden during fertility treatment³⁷.

Two systematic reviews^{36,37}, however concluded that more studies are needed to explore the evidence of both educational and psychological interventions on distress, pregnancy outcomes and marital function in women with infertility. The outcomes of these interventions are uncertain due to inconsistent and unreliable findings in existing studies³⁶. Nevertheless, individuals who received medical information were more satisfied in terms of both their medical and emotional needs³⁶⁻³⁸. Poorer health in women with infertility was associated with, not only poor social support, but also dissatisfaction with the amount of medical information received during treatment³³.

One might assume that the need for educational interventions might decline as people search for medical information online. However, an American study³⁸ found that only 9% of women with infertility searched for information online only. Many more searched online and talked to a doctor in-person, which is an indication that online treatment should be considered as a supplement to receiving personal attention and information from a health practitioner.

Spiritual interventions

Religion and spiritual beliefs can play a significant role in helping women cope with infertility. Findings of an Iranian study³⁹ found that a positive relationship exists between spiritual well-being and its dimensions (existential and religious), and life satisfaction in females with infertility. It is therefore recommended that spiritual and religious consultations be considered for women with infertility as a therapeutic process³⁹.

Among a nationally representative sample of 1062 infertile American women, 74.8% used prayer, while 18.6% consulted with a minister or spiritual leader⁴⁰. Healthcare providers should acknowledge the spiritual needs of women with infertility, but also be aware that spiritual beliefs may limit infertility treatment options and outcomes⁴¹, therefore the right actions should be taken to solve such issues³⁹.

Emotionally focused therapy

Emotionally focused therapy is a type of psychotherapy that focuses on relationship and attachment. The approach encourages individuals to talk about their emotions and emphasize the restructuring of emotions to secure the attachment bond in the couple struggling with infertility. In an Iranian study, this form of intervention created a more secure relationship and trust and reduced the rate of depression, anxiety and stress among infertile couples⁴². Emotionally focused therapy improves psychological outcomes, marital relationships and pregnancy rates among individuals diagnosed with infertility⁴³.

Integrative body-mind-spirit

Integrative body-mind-spirit (I-BMS) is another form of therapy that focuses on the mind, body, and spirit to support individuals who are psychologically stressed. The I-BMS intervention includes relaxation skills training such as meditation, guided imagery, and mindfulness training, while it also fosters resilience and spiritual transformation to promote spiritual well-being. I-BMS helps individuals suffering from infertility to experience higher levels of psychosocial and spiritual wellbeing; individuals who underwent this intervention reported significantly lower anxiety, experienced less disorientation and greater marital satisfaction⁴⁴. Finally, the I-BMS intervention presented an opportunity for participants to prioritize their life goals, understand the importance of meaningful interpersonal relationship, re-evaluate their life goals, focus on personal fulfilment and think about a healthy daily routine, aspects vital to women's well-being⁴⁴.

Discussion

The purpose of this systematic review was to explore the current evidence of holistic healthcare interventions for managing women with infertility. The results provided a number of psychosocial interventions that may potentially be integrated in the management protocols of women diagnosed with infertility. The literature^{30,31} reveal that rendering of these interventions in addition to the medical management, have positive effects on the wellbeing of women and couples suffering from infertility and its related stressors. The psychosocial interventions reduce stress, improve self-perception, have positive effects on the couple's relationship, and improve pregnancy outcomes³⁰.

Couples suffering from infertility expressed the need for psychological counseling to support them with the emotional pain of infertility as well as guide them through the long and expensive treatment program that may not always be successful²⁸. Counseling is in essence a way of helping another person to discover new ways of thinking and behaving through the use of specialized communication skills⁴⁵. As evident from the results, infertility counseling is a specialized field and includes a wide range of methods and therapeutic techniques²⁹. Couples should be informed about the different options and therapeutic indications in order to make an informed decision²⁸. In resource poor settings counseling models are available that can be used by non-specialists, for example, *Fertility Life Counselling Aid*²⁰. This intervention is based on cognitive behaviour strategies and narrative approaches and comes with a manual and workbook that requires minimal training to implement²⁰.

Different studies³⁰⁻³³ with similar findings revealed the positive effects of cognitive behavioral therapy in individuals diagnosed with infertility. This technique offers support to infertile individuals or couples undergoing treatment while it also helps in reducing infertility-induced stress, anxiety, depression and enhances marital, sexual, and life satisfaction³⁰⁻³³. A recent study⁴⁶ in Turkey examined the effects of cognitive behavioral group therapy in women with infertility, presented from a multi-disciplinary perspective. The sessions included psychoeducation, behavioral techniques,

challenging of negative cognitions and coping strategies. The technique proved to be effective in addressing depressive and anxious thoughts and indicated the importance of multidisciplinary collaboration between reproductive health and mental health professionals in the treatment of infertility⁴⁶. Acceptance commitment therapy, which includes intellectual acceptance, problem-solving, mind awareness and pursuit of value-driven behaviors, improved psychological optimism and wellbeing among women with infertility⁴⁷. It can be concluded that cognitive behavioral techniques have potential to significantly decrease fertility stress, but more studies are needed, specifically to investigate the effectiveness in couples³³.

Educational interventions improved self-management, self-efficacy and psychosocial distress³⁶⁻³⁸. Additionally, a study in Ghana indicated that when people lack understanding about infertility it increases their level of stress and anxiety⁴⁸. Few studies focused specifically on educational, or psychoeducational interventions as provision of health information is usually conveyed as routine care³⁶.

Healthcare professionals are challenged to go beyond the existing health triangle of physical, mental and social dimensions, and explore the spiritual well-being of individuals⁴⁹. Spiritual interventions have an influence on both the person's mental and physical wellbeing. Spirituality is a vital aspect of providing holistic and patient-centered care. Spiritual interventions have positive consequences like creating a healing presence and nurturing environment and promoting self-awareness⁵⁰. Regardless of whether one follows a religious practice or not, spirituality improves self-esteem and aids in healing during the grieving process and recovering from tragedies⁴⁹. One study⁴⁰ included in this review explored the utilization of religious support during infertility, while the others focused more on spiritual interventions in general. The integration of spiritual interventions in the treatment of women with infertility needs to be explored in more depth, specifically with regards to the impact of such interventions.

Integrative body-mind-spirit is a form of therapy that provides a holistic approach as it integrates physical, psychological, and spiritual

aspects. Although the intervention was only assessed in one study in Hong Kong in women undergoing their first *in vitro* fertilization, the intervention improved psychosocial and spiritual well-being and relationship satisfaction⁴⁴. This approach shows potential, but needs application in more settings, while the researchers also recommended that future studies should include both men and women⁴⁴.

Infertility affects the bio-psychosocial and spiritual dimensions of a person. A fertility program that neglects any of these dimensions, not only deprives women of the opportunity to heal, but may even contribute to the burden they already suffer. Healthcare providers, managers and policymakers have a responsibility to advocate for and ensure that holistic treatment programs are available for women with infertility. Psychosocial and spiritual interventions should not be viewed as complementary treatment options, but as essential and integral components of infertility treatment.

The review did not yield publications on social interventions such as community education and campaigns to inform communities about different aspects of infertility. The authors identified this as a gap for future research.

Limitations

Firstly, the review included articles as far back as 2010. The researchers wished to have retrieved literature to support the study within a five-year period but experienced difficulties since only a few researchers paid attention to the holistic healthcare interventions in managing women with infertility within the five years' time frame. Secondly, in as much as the researchers expected to find articles in relation to the phrase: holistic healthcare interventions, none was found. Articles on psychosocial interventions were rather found, but with the same meaning and interpretation. Thirdly, only studies published in English were reviewed as the researchers did not make provision for funding to translate studies on psychosocial interventions published in other languages.

Conclusion

With regard to the systematic review of literature, psychosocial counselling, cognitive behavioral

therapy, and educational interventions were the most commonly adapted interventions practiced in different countries as a way of providing holistic care to women suffering from infertility. Acceptance and commitment therapy, and integrative body-mind-spirit interventions were less often adapted. As most studies and reviews retrieved focused on psychosocial interventions during infertility treatment, this review is unique in its inclusion of spiritual interventions, thus focusing on holistic management of infertility. It is worth noting that none of the studies reviewed was conducted in Africa, hence it establishes that the management of women diagnosed with infertility in Africa needs further research to ensure holistic management. The strength of the review lies in the concise summary of psychosocial and spiritual treatment options it provides to healthcare practitioners to consider for inclusion in infertility treatment programs. The results were used to develop guidelines for holistic management of women diagnosed with infertility in Ghana.

Contribution of authors

All the authors were responsible for the conceptualization of this review, the data was retrieved and analyzed by DA and AvdW, and critically revised and interpreted by AvdW, MY and FN. The final version of the manuscript was approved by all authors.

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