

SCALES OF INFERTILITY: A REVIEW ON RECENT AND PAST LITERATURE

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ABSTRACT

Indians have always valued fertility as prosperity. There is a growing epidemic of Infertility in India. The WHO reported the prevalence of primary infertility in India to be 3.9% to 16.8 %. The causal reasons for this epidemic point to various aspects. Couples who undergo treatment face many mental challenges in dealing with helplessness. The psychological impacts of infertility can include anxiety, sadness, and feelings of inadequacy. These psychological effects can worsen the distress further by external factors such as age, lifestyle, family dynamics, and other psychosocial factors. Stress-induced infertility is a major contributor to helplessness among couples. Methods to assess stress and other important psycho-social factors are the need of the hour for early detection. There is a need for the development and standardization of psychological assessment tools for childlessness in the Indian context to deal with the current situation. This review is done to bring out available infertility scales, identify the gaps and limitations, examine the other factors that can be included in the infertility scales, compare the different dimensions measured in these scales, and to find which of these scales is more reliable.

INTRODUCTION

Infertility is a condition that affects the male or female reproductive system which results in the inability to get pregnant within a period of 12 months of unprotected sexual intercourse [1]. Personal, social issues and family dynamics are impacted which results in psychological stress and psychiatric disorders [2]. Research has shown that there is a lack of control over the lives of women experiencing infertility [3]. Women with infertility issues experience social isolation, loneliness, sexual dysfunction [4], low self-esteem [5] and fertility disorder [6]. Depression scores of infertile women are higher than the depression scores of fertile women. The mind and body of infertile patient is negatively affected due to the stigma of childlessness [7]. Infertility leads to the failure to achieve a desired social role, which can cause psychological distress [8]. Infertility can cause women to experience many changes and can cause emotional, social and psychological problems [9]. Psychological impacts like shock, sadness, anger, depression, frustration, loss of confidence, low self-esteem and a general lack of control can be caused by the inability to conceive [10]. According to the Biopsychosocial theory [11], social support and coping strategies apart from the biological aspects play a crucial role in mitigating the psychological and emotional effects of infertility [12]. The Stress and Coping Model explains infertility stress occurs due to the individual's desire to become parents and their inability to fulfill it. Some coping strategies used by individuals experiencing infertility include avoidance, blaming, taking responsibility, problem-focused coping, positive re-evaluation, and seeking social support [13]. In married couples, increased self-esteem is associated with decreased depression. [14] [15]. Depending on the cause and duration of childlessness, mental health can be affected at the rate of 30 to 80 % [16]. In many cultures, motherhood is deeply valued and is seen as a central part of a women's identity, if a woman has not attained motherhood as she gets older, this can cause emotional strain [17]. The infertile women experience more deep emotional distress and men battle with feelings of inadequacy and failure [18]. In patriarchal societies, societal stigma of infertility can affect women in various ways including strained relationships, emotional distress and a lowered social status [19]. Men with infertility experience had a poorer quality of life in comparison to men without infertility [20]. Social expectations of masculinity often emphasize fatherhood and reproductive ability, leading to feelings of inadequacy and worthlessness when these expectations aren't met [21]. The inability to conceive can cause problems in the marriage as the couple might feel guilty, upset or blame each other for the condition [22]. Infertility can cause disagreement within the infertile couple as they blame each other as the reason for childlessness, which results in divorce or can lead to a reduced level of satisfaction in the relationship [23]. Along with divorce, infertility can cause social impacts like social avoidance, verbal abuse and physical violence [24].

Studies show that in order to reduce anxiety and to promote the mental health of infertile women, psychotherapy can be used as an alternative to pharmacological therapy [25]. A study by Chow et al [26] revealed that the psychological interventions provided to infertile couple can result in improvement in psychological outcomes and marital relationships; it also increases patient retention and improve pregnancy rates. Therefore specialists suggest that relaxation techniques like meditation, deep breathing, guided imagery and yoga can be provided as therapeutic techniques which can help in dealing with the stress associated with infertility and its treatment. Mindfulness can

help people manage emotions, self-esteem, and anxiety, which are important for better mental health [27]. Previous studies highlighted that yoga is effective in decreasing the stress of couples undergoing treatment for childlessness [28], [29]. Yazdani et al [30] suggested that psychotherapy should be recommended as an important intervention for any form of infertility experienced by the couple.

A review by Boivin, 2003 found that the benefits of psychological interventions for infertility were more noticeable when specific infertility-related questionnaires were used rather than general ones. This suggests that the emotional struggles of people facing infertility are often limited to specific areas, which may not be captured by broad mental health assessments [31]. Since mental health issues affect both the quality of life and the success of physical treatments for people dealing with infertility and as these mental health problems vary widely, it is necessary to use simple tools to measure their severity; self-reported questionnaires are helpful for this, even though they have limitations, they can still provide useful insights [32]. It has become a necessity to measure culture related aspects of infertility. The aim of this review article is to provide the scales for a comprehensive overview and analysis of scales used to assess infertility. Studies have been carried out in terms of scales measuring infertility stress, to establish content validity of the scales, studies assessing the reliability and validity of the infertility scales, studies assessing the psychometric properties of the infertility scales, studies on infertility scales measuring self-efficacy, quality of life, fertility adjustment and infertility stigma were also carried out. This need for the review is to examine the other factors that can be included in the infertility scales and also to examine which of these scales are more reliable. Methods:

Search strategy

A literature search was conducted from the inception date to 11 February 2024 on the following electronic databases: Web of Science, Pubmed, Google Scholar. No restrictions were established for the time of publication. In order to be considered in this review, studies had to be written in English, Spanish or Portuguese. The key search terms used were: (Infertility OR Fertility) and Scales were searched. Broad themes for Infertility Scales

- A. Scales measuring Psycho-social Stress
- B. Scales measuring Coping:
- C. Scales measuring Social and Emotional Distress
- D. Scales measuring Sexuality and emotions
- E. Scales measuring Infertility Perception
- F. Scales measuring Self Efficacy
- G. Scales measuring Fertility Quality of Life
- H. Scales measuring Adjustment to Infertility
- I. Scales measuring Stigma to Infertility
- J. Others

Table 1: Shows the Broad categories and details of the scales in infertility

Broad Categories	Title of Scales	Author(s)	Year	Variables	Dimensions	Place of study	Language
A. Psycho-social stress	1. Fertility Problem Inventory	Newton et al.[33]	1999	Infertility stress	Personal, marital, social, sexual Concerns	USA	English
	2. Content Validity of A Scale Measuring Psychosocial Stress Factors Among Infertile Women in Treatment	Maya Rathnasaba pathy, Deviga Subramani [34]	2022	Psychosocial stress	Emotional, cognitive, behavioral aspects	Not Specified	Not specified

	3. Admissibility Investigation And Validation Of Infertility Distress Scale (IDS) in Iranian Infertile Women	Arab-Sheybani et al.[35]	2012	Infertility distress	Psychological, social, personal concerns	Iran	Persian
	4. COMPI Fertility Problem Stress Scale	M P Sobral et al.[36]	2017	Infertility-related stress	Emotional, social, personal stress	Portugal	Portuguese
	5. Screening For Infertility-Related Stress at the time of Initial Infertility Consultation	Casu and Gremigni [37]	2016	Infertility stress screening	Psychological distress	Italy	Italian
	6. The Infertility-Related Stress Scale: Validation of a Brazilian-Portuguese Version	G.Casu et al. [38]	2022	Infertility Stress	Cross-cultural validation	Brazil, Italy	Portuguese, Italian
B. Coping Strategy							
C. Social and Emotional Distress	Construction and Validation of Social And Emotional Distress Scale for men and Women Diagnosed With Infertility	Naz Bushra et al [40]	2022	Emotional distress; social distress related to infertility (e.g., distress& identity, well-being, insecurity, sexual/ marital issues)	Distress& identity, Well-being, Feelings of insecurity, Sexual & marital issue	Pakistan	Urdu, English
D. Sexuality and Emotions	Sexuality And Emotions In Infertility questionnaire	T. Cocchiario et al[41]	2020	Emotions, Sexuality And social relationship	Multiple domains regarding emotional, sexual, relational, and social facets	Italy	Italian
E. Perceptions of infertility among women	Infertility Perception Scale for Women (IPSW)	Miok Kim & Minkyung Ba n[42]	2024	Women's perceptions of infertility.	Perceived feelings, Personal stigma, Social stigma, Acceptance	South Korea	Korean

F. Self-efficacy	Development and Validation of the Infertility Self-Efficacy Scale	T.M Cousineau et al.[43]	2006	Self-efficacy in infertility	Emotional resilience, confidence	USA	English
G. Quality Of Life	Fertility Quality of Life Tool	Koert et al.[44]	2019	Fertility-related quality of life	Emotional, social, physical well-being	Not Specified	Not specified
H. Adjustment	Development of the Fertility Adjustment Scale	Glover et al.[45]	1999	Fertility adjustment	Coping mechanisms, emotional adaptation	UK	English
I. Stigma	The Infertility Stigma Scale (ISS)	Fu et al [46]	2015	Infertility stigma	Self- perceived stigma, social Impact	Not specified	Not specified
J. Other	The Psychological Inflexibility Scale – Infertility (PIS-I)	Galhardo, A. et al [77]	2020	Psychological Inflexibility		Portugal	Portuguese

A. The Fertility Problem Inventory (Newton et al.,1999)

The Fertility Problems Inventory assess infertility-related stress provide a liable measure of the perceived stress associated with infertility and specific information about five domains by measuring the impact on social, marital and sexual life dimensions and the importance of parenthood in infertile patients' life. Studies have determined the psychometric properties of the scale in Chinese, Greek, Italian, Iranian and Kannada populations. Born S.L, 2015 [47] examined the archival documents of infertile women and concluded that the scale lacked structure and organization.

Table2: The table listed the studies using the Fertility Problem Inventory.

S.No	Author	Year	Sample	Language
1.	Gorounti et al.,[48]	2011	108 women undergoing IVF	English- Greek
2.	Moura- Ramos et al., [49]	2012	209 infertile patients	Not known
3	Kim J.H &Shin [50]	2014	259 women	Korean
4.	Donarelliet al.,[51]	2015	500 Couples	Italian
5.	Born SL [52]	2015	Case Study	Archival Documents
6.	R.O Samani et al.,[53]	2017	410 patients	Iranian
7.	Zurlo et al.,[54]	2017	206 infertile couples	Italian
8.	Patel et al.,[55]	2022	205 patients (113 women and 92 men)	Kannada

A2. Content Validity of a Scale Measuring Psychosocial Stress Factors among Infertile Women in Treatment (Maya Rathnasabapathy, Deviga Subramani ,2022) [34]

The objective of the study is to establish the content validity of a scale constructed to measure the psychosocial stress of infertile women in treatment. Initially, the scale had 95 items after content validity the items in the scale were reduced to 80. The questionnaire included the following dimensions: Emotional, cognitive, behavioural, rational, social medical and spiritual dimensions. There are not enough studies using this scale.

A 3. Development of Infertility Distress Scale(IDS) (Arab-Sheybani et al 2012) [35]

This scale assesses infertility depression scale in Turkish women. This scale determines distress level among women facing infertility and the distress in the treatment process. This scale has been adapted in various populations like Iranian, Chinese and German. This scale measures stress perceived by andrological patients resulting from infertility among the German population. It has been a good fit in tapping a single underlying component.

Table3: The table listed the studies using the Infertility Distress Scale.

S.No	Author	Year	Sample	Language
1.	M.Pook & W.Krause [56]	2002	769 German patients	German
2.	Arab-Sheybani et al.,[35]	2012	300 women (145fertile and 155 infertile)	Iran
3.	Siyan Liu et al[57]	2025	592 Infertile Chinese Women	China

A4. COMPI Fertility Problem Stress Scale by Sobral et al., 2016 [35]

The COMPI Fertility Problem Stress Scales is liable and valid tool to measure stress related to infertility. The structure, reliability validity, and measurement invariance of the COMPI-FPSS and its three domains- Personal Stress, Marital Stress, and Social Stress. COMPI- FPSS can be regularly administered in both research and clinical settings. The COMPI-FPSS is a valid and reliable tool expressing good fit in majority of the analysed countries and demonstrating full invariance across genders and partial invariance across cultures. A Persian version has been developed using tool translation and psychometric testing. The Persian version of the COMPI-FPSS had 11 items and 3 factors had the desired cultural adaptation, reliability and validity. Likewise, the scale has been adapted in Chinese population. The revised Chinese version of the COMPI-FPSS shows good reliability and validity and can be used to assess infertility-related stress of infertile patients in China. A study during COVID-19 in Turkey studied the effect of the COVID-19 outbreak on infertile couples dealing with stress and anxiety during in vitro fertilization treatment. This scale has been helpful in understanding stress associated with infertility in the COVID-19 context.

Table 4: The table listed the studies using the COMPI Fertility Problem Stress Scale

S.No	Author	Year	Sample	Language
1.	Sobral et al.,[35]	2017	3923infertile patients (1961 men, 2232 women) across 7 countries withmean age of 34	Denmark, China, Croatia, Germany, Greece, Hungary and Sweden
2.	Ahmad-Amrajietal., [58]	2021	200 infertile People	Iran
3.	Yurci& Karayagiz [59]	2021	252 infertile Patients	Turkey
4.	Gao et al.,[60]	2023	418 Participants	China

A5.Screening for infertility-related stress at the time of initial infertility consultation: Psychometric properties of a brief measure (Casu and Gremigni, 2016) [36]

The brief self-report to measure infertility- related stress at both interpersonal and intrapersonal levels and to find whether socio- demographic causes of infertility, anxiety, and depression were associated with infertility stress.

Patients with above-threshold levels of anxiety and depression showed higher in fertility stress in both domains, particularly in the intrapersonal area. Infertility stress was significantly higher in women than in men in the intrapersonal domain. This scale can help fertility clinic staff identify patients who need support in overcoming infertility stress in interpersonal and intrapersonal domains. There are not enough studies using this scale.

A6. The Infertility-Related Stress Scale: Validation of a Brazilian-Portuguese Version and Measurement Invariance across Brazil and Italy. (Casu et al., 2022) [37]

The IRSS is a 12-item self-report questionnaire designed by Casu and Gremigni (2016) to assess the level of various domains of life. Two independent bilingual translators translated the Italian IRSS into Brazilian-Portuguese and then back-translated it into Italian. 2. Beck Depression Inventory-II: The BDI-II is a widely used 21-item self-report measure that assesses cognitive, motivational, affective, and somatic symptoms of depression. The validated Brazilian-Portuguese version of the BDI-II was used. Results indicate that the underlying structure of the IRSS-BP score is best represented by a two-factor solution that integrates a general infertility-related stressor and two specific components, intrapersonal and interpersonal effects of infertility-related stress. Therefore, future studies could collect data on both members of the couple and use a dyadic approach to test the dyadic invariance of the two-factor IRSS-BP model across infertile couples. There are not enough studies using this scale.

B1. The Copenhagen Multi-centre Psychosocial Infertility Fertility Problem Stress and Coping Strategy Scales: A Psychometric Validation Study in Turkish Infertile Couple by Dr.Tulay Yumaz et al 2016 [37]

The Copenhagen Multi-centre Psychosocial Infertility (COMPI)Fertility Problem Stress and Coping Strategy Scales uses translate and retranslate method was used to determine the language in both scales. It can be applied to both men and women. The limitation of the study is that it was carried out within a single institution and the couples were not differentiated based on primary & secondary infertility. Volmer et al [61] looked into how infertile couples cope with the emotional challenges they face and found that not all coping strategies are helpful—some seemed to protect couples emotionally, while others actually made things harder. Later, Troung et al. [62] discovered that the way women going through IVF choose to cope can shape how supported they feel by others.

Table 5: The table listed the studies using the Copenhagen Multi-centre Psychosocial Infertility Fertility Problem Stress and Coping Strategy Scales

S.No	Author	Year	Sample	Language
1.	Volmer et al.,[61]	2017	Total of 296 Women and men	Germany
2.	Troung et al.,[62]	2024	383 Vietnamese women	Vietnam

C1. Construction and Validation of Social and Emotional Distress Scale for men and women diagnosed with Infertility (Naz Bushra et al 2022) [40]

The scale measures infertility-specific emotional and social distress (ESD)among men and women. The scale previously had 74 items which were reduced to 35 items. The variables are 1. Distress & identity, 2.well-being, 3.feelings of insecurity, 4.sexual& marital issues. The reliability estimates and item-total correlation supported the high internal consistency of ESD- Scale and good convergent validity with similar variables. The measure was developed with a culturally tailored approach and offered psychometrically acceptable results. There are not enough studies using this scale.

D .Sexuality and Emotions in Infertility questionnaire (T.Cocchiaro et al,2020) [41]

The scope of the scale is to probe and assess the emotional aspects, sexuality, and social relationships of the couple seeking medical care for infertility. The scale has been administered for pilot study. The validity and reliability has not been established.

E. Infertility Perception Scale for Women(IPS-W)(Miok Kim & MinkyungBan, 2024)[42]

The IPS-WIS 21 is designed to assess Korean women's perceptions of infertility, focusing on emotional and cognitive aspects. The four factors assessed by the infertility perception scale were perceived feelings, personal stigma, social stigma, and acceptance. The items have convergent, discriminant, and known group validity, concurrent validity testing. The internal consistency reliability was acceptable.

F.Development and Validation of the Infertility Self-Efficacy Scale (Cousineau et al., 2006) [43]

The Infertility Self- Efficacy Scale could assess patients confidence levels on the aspects of cognitive, emotional and behavioural skill related to infertility and its medical treatment. The ISE scale was developed in three main phases, 1. Item generation 2. Item reduction and initial construct validity and 3. Construct validity. The strength of this study is the multi-disciplinary collaborative approach to item generation and the methodological approach

to psychometric scale development. Galhardo et al.(2013) [63] developed the Infertility Self-Efficacy Scale (ISE) to assess how confident individuals feel in coping with infertility, and confirmed its reliability and validity. Fuetal.(2016) [64] later validated a shorter16- item version among Chinese women undergoing treatment, also finding it to be a reliable tool.

Table 6: The table listed the studies using the Infertility Self-Efficacy Scale

S.No	Author	Year	Sample	Language
1.	Galhardo et al.,[63]	2013	287 Participants (156women, 131 male)	Portugal
2.	Fu et al.,[64]	2016	177 infertile Women	China

G. Fertility Quality of life tool (Koertetal., 2019) [44]

The 36-item Fertility Quality of Life (FertiQoL) tool is progressively utilized in research and practice. It measures quality of life in four individual domains (emotional, social, relational, mind/body) and two treatment domains (tolerability, environment). Poorer fertility quality of life was consistently associated with being a woman, longer duration of infertility, poorer psychological functioning, and lower patient-centered care. Some FertiQoL subscale scores

improved after psychological interventions. Boivin et al [65] developed and validated the Ferti QoL as a reliable tool to assess how infertility affects quality of life. (Karabulut et al. 2013) [66] found better quality of life in women with secondary infertility and higher education, while longer infertility and need for support were linked to poorer outcomes. (Hsu et al. 2013) [67] used the scale in Taiwan to understand how infertility affects couples' daily lives.(Donarelli et al. 2016) [68] confirmed that the relational subscale captures the couple's experience well.(Allard-Philipsetal.2024) [69] found no difference in quality of life between fertility app users and non-users.

Table 7: The table listed the studies using the Fertility Quality of life tool

S.No	Author	Year	Sample	Language
1.	Boivin et al., [65]	2011	1414 Participants	USA, Australia/New Zealand, Canada and UK
2.	Karabulut et al., [66]	2013	273 patients	Turkey
3.	Hsu et al.,[67]	2013	534 patients	Taiwan
4.	Donarelli et al.,[68]	2016	589 patients (301 women, 288 men)	Italy
5.	Allard-Philips et al[69]	2024	149 Participants	Canada USA, Australia/New Zealand, Canada and UK

H. Development of the Fertility Adjustment Scale (Gloveretal.,1999) [45]

The goal of this study was to develop a standardized measure of psychological adaptation to infertility. A two-group cross-sectional comparative study design was used. The Fertility Adjustment Scale was administered with the Hospital Anxiety and Depression Scale as a concurrent measure. The primary outcomes were the Fertility Adjustment Scale and the Hospital Anxiety and Depression Scale. As a result, the scores on the Fertility Adjustment Scale have a normal distribution. Significant correlations with measures of mood, anxiety, and distress provided evidence of concurrent validity. Arslan et al. 2016 [70] used the Turkish version of the scale as it worked well in measuring how women in Turkey adjusted to infertility. Similarly, (Tiyuri et al. 2018) [71] developed the Persian version helped capture the emotional impact of infertility and the effects of treatment. (Torabi et al. 2019) [72] applied a modified version with couples undergoing ART and found it to be a reliable way to assess adjustment during such a stressful process. Recently, Kucukkepce and Unver ,2022 [73] highlighted how important partner support is, showing that women with more support from their spouses tend to adjust better to infertility.

Table 8: The table listed the studies using the Fertility Adjustment Scale

S.No	Author	Year	Sample	Language
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1.	Arslan et al.,[70]	2016	240 infertile Women	Turkey
2.	Tiyuri et al.,[71]	2018	40 infertile women	Iran
3.	Torabi et al.,[72]	2019	212 couples undergoing ART	Iran
4.	Kucukkelepce & Unver[73]	2022	139 infertile Women	Turkey

1. The Infertility Stigma Scale (ISS; Fuetal.,2015) [46]

This scale was developed to measure both perceived stigma and self-stigma in Chinese women coping with a diagnosis and treatment for infertility. Results from a sample of Chinese infertile women yielded an ISS consisting of 27 items with 4 factors (low self-esteem, social withdrawal, public stigma, and family stigma). The Cronbach's α coefficient, split-half coefficient, and Cronbach's test-retest correlation coefficients for the entire scale were 0.94, 0.90, and 0.91, respectively. The association of the ISS with other measures showed good convergent validity. The content validity index (CVI) is 0.92. (Rajabi et al. 2017) [74] validated the Persian version of the Infertility Stigma Scale, confirming its reliability and suitability for assessing stigma in Iranian women. (Capik et al. 2019) [75] found the Turkish version to be a valid tool for identifying infertility-related stigma and informing interventions. (Yokota et al. 2022) [76] confirmed that the Japanese version had acceptable reliability and could effectively measure stigma in the Japanese population.

Table 8: The table listed the studies using the Infertility Stigma Scale

S.No	Author	Year	Sample	Language
1.	Rajabi et al.,[74]	2017	166 women	Iran
2.	Capik et al.,[75]	2019	178 infertile women	Turkey
3.	Yokota et al.,[76]	2022	254 Participants	Japan

Others: The Psychological Inflexibility Scale – Infertility (PIS–I) Galhardo, A. et al 2020[77]

Based on the Acceptance and Commitment Therapy (ACT) conceptual framework, literature review and clinical expertise in the infertility domain, an initial pool of 18 items was developed. An online survey was conducted with 287 Portuguese women presenting an infertility diagnosis. Exploratory Factor Analysis revealed that a refined version of the PIS-I, encompassing 16 items, presented a single-component structure accounting for 58.92% of the variance. Psychometric analyses showed an excellent internal consistency and support for the PIS-I convergent, concurrent, and incremental validities was found. Overall, the PIS-I showed to be a context-specific reliable and valid measure of psychological inflexibility for people dealing with infertility, being useful for clinical and research purposes.

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