

AFRICAN JOURNAL
OF EDUCATIONAL
PSYCHOLOGY

MANUSCRIPT PARJ-2026-
1807907
DOI Pending awaiting APC

ORIGINAL RESEARCH ARTICLE

OPEN ACCESS

VOL.
1

ISSUE
1

YEAR
2026

PAGES
1-

ARTICLE TYPE
Original Research
Article

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Received: 23/07/2026 Revised: 05/09/2026 Accepted:
14/09/2026 Published: Pending

INDEXING & DISCOVERY



zenodo



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Original Research Article

Abstract

Infertility has psychological, relational, sociocultural and economic consequences that may remain insufficiently addressed when care concentrates primarily on biomedical diagnosis and treatment. This study examined the psychosocial influence of infertility among adults in Juba, South Sudan; assessed the importance of psychoeducation within psychosocial management; and evaluated the usefulness of psychosocial assessment domains for identifying stress and depression-related distress. A pragmatist, convergent mixed-methods analytical cross-sectional design was used. The completed database contained 100 individual participant records within an intended 50-couple study framework. Quantitative data were analysed using descriptive statistics, group comparisons, correlation, regression, reliability and exploratory structure procedures, while qualitative responses were interpreted thematically. The overall psychosocial-influence score was high ($M = 3.44$, $SD = 0.43$). Family and community stigma recorded the highest domain mean ($M = 3.95$), followed by treatment-related emotional distress ($M = 3.89$) and economic burden ($M = 3.54$). Age groups differed significantly, $F(3, 96) = 4.102$, $p = 0.009$, although chronological age was not linearly associated with the composite score; treatment duration showed a significant positive correlation ($r = 0.219$, $p = 0.028$). Psychoeducation was rated highly (composite $M = 3.94$, $SD = 0.43$) and was moderately associated with adaptive coping ($r = 0.460$, $p < 0.001$); in the multivariable coping

model it remained the significant predictor ($\beta = 0.445$, $p < 0.001$). The assessment domains captured clinically relevant emotional, relational and contextual information, but the four-domain internal consistency was modest (Cronbach's $\alpha = 0.463$) and factorability was marginal (KMO = 0.589), indicating that the instrument should not be treated as a single validated psychometric scale. The study concludes that infertility in Juba is a biopsychosocial and relational experience requiring routine psychoeducation, couple-sensitive counselling, repeated distress screening, culturally responsive family and community engagement, and clear referral pathways. Further independent validation of distinct assessment subscales is recommended.

Keywords: infertility; psychosocial influence; psychoeducation; distress screening; coping; couples; Juba; South Sudan

1. Introduction

Infertility is a reproductive-health condition whose consequences extend beyond difficulty in achieving pregnancy (World Health Organization, 2023; Zegers-Hochschild et al., 2017). For couples, the experience may affect personal identity, emotional wellbeing, marital interaction, sexual intimacy, family relationships, social participation and economic security (Luk & Loke, 2015; Roomaney et al., 2024). Contemporary scholarship therefore approaches infertility as both a reproductive-system disease and a multidimensional psychosocial stressor whose meaning is shaped by the social environment (Boivin & Gameiro, 2015; Roomaney et al., 2024). These pressures may be intensified where marriage and parenthood are closely linked and relatives or community members impose repeated questions, blame, stigma or expectations for intervention (Tabong & Adongo, 2013b; Xie et al., 2023). This study examined these interconnected experiences among couples in Juba, South Sudan, together with the place of psychosocial management and psychoeducation within infertility care (Totuliano, 2022).

The global burden of infertility is substantial, although its precise measurement is complicated by differences in definition, study design, age range, partnership status, pregnancy intention and period of observation. The World Health Organization's synthesis of studies conducted between 1990 and 2021 concluded that approximately 1 in every 6 adults experiences infertility during the reproductive years (World Health Organization, 2023). A related systematic review and meta-analysis by Cox et al. (2022) included 37 studies in the lifetime-prevalence analysis and 43 studies in the period-prevalence analysis. The pooled estimates

were equivalent to approximately 18 in every 100 people for lifetime infertility and 13 in every 100 people for infertility during a defined period (Cox et al., 2022). These figures indicate that infertility is not a rare experience confined to a small clinical population. They also show why infertility requires attention within universal health coverage, reproductive rights, primary care, specialist services and mental-health planning. Nevertheless, the same review found major geographic evidence gaps, including only 2 African studies that contributed to the lifetime-prevalence estimate, which limits the certainty with which global figures can be applied to particular African countries.

Infertility can be experienced as a prolonged and ambiguous loss because the desired child is imagined and socially anticipated but may never be conceived, carried or born. Unlike a single event with a clear endpoint, the experience often unfolds through months or years of unsuccessful attempts, medical consultations, tests, treatment cycles and periods of waiting. Each menstrual period, negative pregnancy test, cancelled cycle or pregnancy loss may reactivate grief and uncertainty, while relatives' pregnancies and community celebrations can intensify social comparison. Psychological responses therefore vary across time and may include shock, denial, anger, sadness, guilt, shame, helplessness and reduced self-worth. These reactions are not evidence that all people with infertility have psychiatric disorders; rather, they show that infertility can place sustained pressure on ordinary coping resources. The severity of distress is influenced by treatment duration, previous reproductive loss, perceived cause, financial burden, partner support, stigma, personal meaning and access to professional help (Boivin & Gameiro, 2015; Luk & Loke, 2015). A couple-centred assessment must consequently consider both symptoms and the context in which they develop.

Depression, anxiety and stress are the most frequently measured mental-health outcomes in infertility research. Salari et al. (2024) synthesised 44 studies involving 53,300 women and reported pooled burdens equivalent to approximately 23 in every 100 for major depressive disorder, 13 in every 100 for generalised anxiety, 79 in every 100 for stress and 32 in every 100 for depressive symptoms, although estimates varied by instrument and study setting. A separate systematic review and meta-analysis by Fallahzadeh et al. (2019), based on 11 comparative studies, found higher depression and anxiety among couples with infertility than among fertile comparison groups. These figures should not be interpreted as fixed rates for every country because the included populations were clinically and culturally diverse. They nevertheless demonstrate that emotional symptoms are common enough to justify routine

enquiry, validated screening and referral pathways within fertility services. They also support routine evaluation of psychosocial assessment approaches for identifying stress and depression-related distress in infertility care.

The psychosocial meaning of infertility depends partly on the social value assigned to children. In many societies, parenthood is connected to adult identity, marital legitimacy, continuity of the family name, inheritance, care in later life and membership within kinship networks. Where these expectations are strong, childlessness may be interpreted not as a private medical condition but as a failure to fulfil obligations to the spouse, ancestors, family or community. Tabong and Adongo (2013b) found that childbearing in Northern Ghana was understood through social continuity, status and family expectations, illustrating how the meaning of infertility exceeds the desire for an infant alone. Cultural expectations can therefore magnify distress even when a couple has a stable relationship, because the couple must manage evaluations made by others. This study's questions on culture, marriage, goals, values and personal expectations are designed to capture this interpretive level. Such questions are important because the same clinical diagnosis may produce very different consequences depending on whether childlessness is tolerated, pitied, blamed or punished within the surrounding community.

Stigma is one of the clearest mechanisms linking cultural expectations to mental health. It may begin with labelling and marking, continue through gossip, insults, exclusion, discriminatory treatment or threats to the marriage, and become internalised as shame or self-blame. Ekpore et al. (2025) identified 1,987 records and included 48 studies from 15 African countries in a systematic review and mixed-methods meta-synthesis. Their synthesis organised infertility stigma into mechanisms, social marking, manifestations and consequences, and found that some included studies reported stigma affecting approximately 64 in every 100 participants. Roomaney et al. (2024) similarly identified attitudes and stigma as major areas within African psychosocial research. These reviews show that stigma is not merely an unpleasant attitude; it can influence disclosure, treatment-seeking, mental health, relationship security and willingness to use support services. Measuring stigma should therefore consider who communicates it, how it is expressed, how frequently it occurs and what behavioural consequences follow, rather than asking only whether the participant has ever felt stigmatised.

Economic conditions influence every stage of the infertility pathway. Direct costs include consultation, laboratory tests, medicines, procedures, transport and accommodation, while

indirect costs include time away from work, loss of income, borrowing and the opportunity cost of repeated clinic attendance. In settings where treatment is financed mainly out of pocket, couples may sell assets, depend on relatives or discontinue care despite continuing distress. Cost can also alter relationship power where one partner or extended family controls financial resources. Boivin et al. (2007) demonstrated that the demand for infertility care cannot be understood solely from prevalence because many people who need services do not seek or receive them. Gameiro et al. (2012) further showed that financial and treatment burdens contribute to discontinuation. Economic assessment should therefore include employment, income stability, treatment expenditure, financial support and the perceived fairness of allocating household resources to fertility care. This study tool's questions on daily earnings, nature of employment, living conditions and family financial support provide a foundation for this analysis, although income questions should be framed sensitively and reported in ranges or anonymised categories where necessary.

Psychosocial management refers to organised efforts to address the emotional, cognitive, relational and social dimensions of infertility alongside medical evaluation and treatment. Its evolution reflects the movement from optional counselling offered after a crisis towards routine, patient-centred care throughout the fertility pathway. Boivin and Gameiro (2015) describe how counselling initially focused on emotional expression and adjustment but later incorporated evidence-based assessment, decision support, communication, preparation for treatment, coping skills and attention to diverse family-building options. Modern psychosocial care may be delivered by psychologists, counsellors, psychiatrists, social workers, nurses, physicians or trained peer facilitators, depending on the level of need and the resources available. It is useful to distinguish routine psychosocial care, which all fertility staff should provide, from specialised psychological treatment for people with severe or persistent difficulties. The ESHRE guideline developed by Gameiro et al. (2015) produced 120 recommendations to help fertility staff respond to patients' needs before, during and after treatment, demonstrating that psychosocial care is a service-quality responsibility rather than an optional addition.

Psychoeducation is a central component because uncertainty and misinformation can intensify distress. It involves structured provision of information about infertility, diagnostic procedures, treatment options, likely emotional reactions, coping strategies, communication, support resources and indicators for professional referral. Effective psychoeducation is not a single lecture; it is adapted to the couple's stage of care, literacy, language, beliefs and

decisions. Before treatment, couples may need realistic information about procedures, costs and possible outcomes. During treatment, they may need preparation for waiting periods, side effects and uncertainty. After an unsuccessful cycle, they may require support in processing loss and considering whether to continue, pause or stop. Psychoeducation can also address myths that infertility is always caused by women, that stress alone explains the condition or that treatment guarantees pregnancy. In this study, participants' awareness of wellbeing, stress management and psychological factors was examined as part of the evidence needed to design locally appropriate psychoeducation.

In resource-constrained settings, psychosocial care must be designed for feasibility. Specialist psychologists may be few, and fertility services may be delivered through general hospitals, private clinics or cross-border referrals. A stepped-care model can respond to this reality: all couples receive respectful communication and basic psychoeducation; those with elevated distress receive structured counselling or group support; and those with severe depression, suicidality, substance problems or complex psychiatric conditions receive specialised assessment and treatment. Screening tools can support this model only when they are culturally understandable, ethically administered and linked to action. A score without a referral pathway has limited value. Evaluation of stress- and depression-assessment approaches therefore considered acceptability, clarity, sensitivity to local language, feasibility, confidentiality and usefulness for clinical decisions. The broader assessment domains-relationships, culture, economic conditions, family support, coping, substance use and mental status-can help prevent an overly narrow interpretation of distress.

African infertility scholarship has developed from demographic and biomedical investigations towards a broader examination of treatment access, gender, stigma, quality of life, religion and lived experience. Roomaney et al. (2024) searched 12 databases and grey literature sources, identified 2,372 records and included 116 studies published between 2000 and 2022. The review showed that 81 in every 100 included studies came from Nigeria, Ghana and South Africa, leaving large parts of the continent with limited evidence. This geographic concentration matters because Africa contains diverse languages, kinship systems, religious traditions, health systems and histories of conflict; findings from one country cannot be assumed to represent another. The review nevertheless identified recurring themes, including quality of life, barriers to care, attitudes, stigma and sociocultural and religious dimensions. Its principal implication for this study is that psychosocial infertility research in Juba is not a

repetition of an already saturated evidence base but an effort to address a clear regional and country-level gap.

South Sudan's health system has developed under conditions of prolonged conflict, displacement, economic instability, workforce shortage and uneven infrastructure. These structural conditions affect all specialised services, including reproductive health and mental-health care. A rapid appraisal conducted in conflict-affected southern Sudan by Palmer (1999) included 20 key-informant interviews, 14 in-depth interviews with women and 23 group discussions and found clear reproductive-health needs, differences between community and provider priorities, and barriers associated with supplies and access. Although the study predates independence and did not focus specifically on infertility, it is historically important because it shows that reproductive-health needs in the region have long been embedded in insecurity, displacement and service limitations. The evidence cautions against analysing infertility only at the individual level, since couples' choices are constrained by the availability, affordability and continuity of care.

Infertility constitutes a substantial global reproductive and mental-health concern, yet the emotional and relational burden remains inconsistently addressed within fertility services. The World Health Organization estimates that about 1 in every 6 adults experiences infertility during the reproductive years, while Cox et al. (2022) derived pooled burdens equivalent to about 18 in every 100 people over a lifetime and 13 in every 100 during a defined period from 37 and 43 studies respectively. Psychological evidence is similarly substantial: Salari et al. (2024) synthesised 44 studies involving 53,300 women and reported burdens equivalent to approximately 23 in every 100 for major depressive disorder, 13 in every 100 for generalised anxiety, 79 in every 100 for stress and 32 in every 100 for depressive symptoms. Fallahzadeh et al. (2019) included 11 comparative studies and found higher depression and anxiety among couples with infertility than fertile controls; Leeners et al. (2023) reviewed 170 manuscripts on sexual wellbeing; and Gameiro et al. (2012) analysed 22 studies involving 21,453 patients from 8 countries and demonstrated that psychological, physical, personal and relational burdens contribute to treatment discontinuation. African evidence confirms that these concerns are socially embedded: Roomaney et al. (2024) screened 2,372 records and retained 116 studies, but 81 in every 100 of those studies were conducted in only Nigeria, Ghana and South Africa, while Ekpore et al. (2025) identified 1,987 records and included 48 studies from 15 countries on infertility stigma. The numerical scale of the evidence therefore establishes

both the seriousness of psychosocial consequences and the unequal geographic distribution of knowledge.

The South Sudanese evidence base remained insufficient for answering these questions. Existing reproductive-health studies documented major structural constraints, but they did not provide an integrated account of infertility-related distress, stigma, coping, couple relationships, psychoeducation and screening in Juba. The study therefore analysed 100 individual participant records within a couple-focused framework, while treating each participant as the quantitative unit of analysis because complete dyadic identifiers were not available for all respondents. This distinction avoided representing the database as 50 statistically matched pairs and allowed the findings to remain faithful to the final analytical structure.

Against this background, the study had three linked aims: to characterise the psychological, relational, social, cultural, religious and economic influence of infertility among adults in couple relationships in Juba; to assess the importance of psychoeducation for psychosocial management and adaptive coping; and to evaluate the preliminary usefulness of a broad psychosocial assessment approach for identifying stress, depression-related manifestations and contextual risk. Bringing these aims together allowed the analysis to move from description of burden to identification of modifiable service responses and practical screening needs.

2. Materials and Methods

2.1 Study design and setting

A mixed-methods approach was used because the research questions required both statistical description and contextual interpretation. The quantitative strand generated frequencies, percentages and composite domain scores and examined associations among psychosocial influence, psychoeducation, coping, family support and high distress. The qualitative strand retained participants' accounts of treatment frustration, cultural expectations, stigma, marital and sexual experiences, financial burden, faith, resilience and recommendations for care. The two strands therefore addressed different but complementary dimensions of the same research problem: quantitative findings indicated the distribution and strength of observed patterns, while qualitative findings helped explain the social meanings and circumstances underlying those patterns (Creswell & Plano Clark, 2018).

The study employed a convergent mixed-methods strategy in which quantitative and qualitative evidence was collected during the same assessment period, analysed through distinct procedures and integrated during interpretation. Demographic and coded variables were entered into a Microsoft Excel database, while open-ended responses were transcribed and organised for thematic analysis. Integration was undertaken by comparing numerical patterns with participants' explanations. For example, levels of stigma and distress were considered alongside accounts of blame, ridicule and exclusion; family-support indicators were interpreted with narratives of prayer, practical assistance or lack of support; and psychoeducation scores were compared with participants' stated informational and counselling needs. The design therefore examined convergence, complementarity and divergence, retaining contradictory findings where they provided meaningful contextual information rather than forcing agreement between the two strands (Fetters, Curry, & Creswell, 2013).

An analytical cross-sectional design was used because demographic, treatment, psychosocial, coping, psychoeducation and mental-health information was collected at one point in time without manipulation or follow-up. The design enabled the study to describe the distribution of psychosocial experiences and to test whether scores differed according to gender, age, education, economic status and treatment duration. It also allowed associations among family support, stigma, coping, psychoeducation and distress to be examined. The design was analytical rather than purely descriptive because inferential procedures were used to test relationships and group differences. Nevertheless, the cross-sectional nature of the data did not permit causal conclusions. For example, an association between treatment duration and distress could not establish whether longer treatment increased distress, whether more distressed participants remained in treatment longer, or whether both were influenced by factors such as economic pressure or stigma (Setia, 2016).

The study was conducted in Juba, the capital of South Sudan and the centre of Central Equatoria State. Juba was selected because it brings together residents of varied ethnic, religious, educational and socioeconomic backgrounds and contains a concentration of public, private and faith-based reproductive-health services. It also receives people from other parts of the country who travel to the capital to seek specialised care. Fertility assessment and infertility-treatment options nevertheless remain limited, and some couples seek services outside South Sudan. These circumstances made Juba relevant for examining treatment burden, family expectations, spiritual interpretations of parenthood, economic constraints and

cross-border care. As discussed in the reviewed literature, reproductive- and mental-health services in South Sudan operate within social, institutional, financial and transport constraints that can affect continuity of care (Mugo et al., 2018a, 2018b; Tutlam et al., 2024). The study therefore considered service access and psychosocial experience as closely connected aspects of the research context.

Participants were recruited in 2026 through selected public and private reproductive-health and gynaecological service points, mental-health referral networks and community access channels in Juba. These access points were selected purposively because they provided contact with adults who identified as experiencing infertility or who had sought infertility-related reproductive-health care. Authorised gatekeepers facilitated initial contact, but eligibility screening, informed consent and completion of the assessment were conducted confidentially, and gatekeepers did not have access to completed responses. Using both health-service and community access channels broadened recruitment beyond a single clinic and was appropriate for participants whose treatment pathways and socioeconomic circumstances differed.

2.2 Population, sample and sampling

The target population comprised adult men and women in couple relationships who were experiencing infertility and had sought, were seeking or had previously discontinued infertility-related care in Juba. Participants could have experienced primary or secondary infertility and could have histories that included medication, surgery, other fertility-related treatment or advice from medical, religious, family or traditional sources (Makara et al., 2017). Inclusion was not restricted to participants currently receiving treatment because psychosocial needs may arise before, during or after a treatment episode. The study population was defined by the reported experience of infertility and treatment-seeking rather than by the study independently establishing a laboratory diagnosis. Medical and treatment histories were therefore analysed as reported characteristics rather than as diagnoses generated by the research.

The unit of observation was each consenting adult who completed the assessment, and the unit of quantitative analysis was the individual participant. Qualitative interpretation focused on experiences occurring within couple relationships, but responses were not combined into couple-level scores unless explicitly stated. This distinction prevented the 55 female and 45 male participants from being misrepresented as 50 matched heterosexual pairs. Gender

comparisons therefore referred to male and female participants in the sample rather than within-couple differences. Future dyadic research could assign both individual and couple identifiers so that actor, partner and between-couple effects could be modelled appropriately.

The original study design targeted 50 couples experiencing infertility, equivalent to 100 individual partners if both members of every couple participated. The completed analytical database contained 100 individual participant records. Because complete dyadic identifiers were not available for all respondents, the final quantitative analyses treated the individual participant as the unit of analysis rather than assuming 50 statistically matched pairs. The sample was intended to provide detailed evidence on the characteristics and experiences of women and men affected by infertility, not to estimate the prevalence of infertility in the wider Juba population. It also provided variation in age, religion, education, socioeconomic status and treatment duration for the limited inferential analyses undertaken.

2.3 Data-collection instrument and measurement

Data were collected using a structured psychosocial infertility assessment instrument. The tool was designed by integrating the study framework and the issues identified in the literature. The instrument consisted of multiple-choice and open-ended questions. The tool was divided into sections A-K. Section A collected the participant's age, gender, religion, education, place of residence, and economic status. Section B explored the commencement of the treatment, progress, feelings, and support. Section C assessed the participants' personal, cultural, and religious beliefs. Sections D-F evaluated the marital, sexual, family, community, environmental, and socioeconomic aspects. Sections G and H examined the physical health status, surgery, medication, and substance use. Sections I-K evaluated self-harm, suicide risk, coping, resilience, knowledge, behaviour, mood, perception, and self-recognition. The tool's comprehensive nature was justified by the biopsychosocial model of health, which considers the interaction of biological, psychological, and social factors (Engel, 1977; Gameiro et al., 2015).

A coding manual was developed before inferential analysis. Each construct was operationally defined, and response evidence was assigned to ordered categories according to explicit indicators. For adverse domains, higher scores represented stronger or more severe evidence of burden; for example, a response indicating no treatment-related emotional difficulty received a lower score than a response describing prolonged stress, hopelessness and social withdrawal. Positive constructs such as coping were scored in the opposite conceptual

direction, with higher scores representing a greater range or strength of adaptive strategies. Blank, unreadable or irrelevant responses were coded as missing or not applicable rather than being assigned substantive scores unless the response itself explicitly indicated a defined category.

Open-ended responses were treated as a qualitative source of evidence in their own right rather than merely as quotations used to decorate numerical findings. Each response was examined for meaning, context, mechanisms, contradictions and variation. The qualitative strand therefore preserved nuances that could be lost when responses were reduced to five-point coded categories, including meanings attached to childlessness, reasons for non-disclosure, religious views of IVF, treatment-related financial pressures and forms of coping. Quotations were selected because they clearly illustrated a theme, demonstrated variation or provided a contrasting case. Personal identifiers, including telephone numbers and any other information that could reveal identity, were removed before reporting.

Construct validity was examined cautiously because the instrument covered heterogeneous domains and the sample was modest. The Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity were applied to a limited set of theoretically related indicators before exploratory principal-component analysis; the procedure was not applied indiscriminately to all coded variables. Convergent patterns were also examined through theoretically expected associations: stigma, treatment burden and economic hardship were expected to relate positively to distress, whereas coping and support were expected to relate positively to adjustment. Quantitative patterns were then considered alongside corresponding qualitative accounts. These procedures provided preliminary evidence concerning structure and theoretically coherent relationships, but they did not establish national norms, diagnostic validity or measurement invariance across population groups.

Internal consistency was evaluated only for sets of indicators intended to represent a common construct. Cronbach's alpha, corrected item-total correlations and alpha-if-item-deleted statistics were examined together rather than relying on a single threshold. A low alpha could reflect weak items, but it could also arise because the broad psychosocial domains were genuinely multidimensional. Reliability was therefore interpreted in relation to the theoretical structure, item performance and exploratory analysis rather than being reduced to a mechanical cut-off (Taber, 2018).

The assessment was administered in a private session by the researcher or a trained assistant. It was self-administered when participants were able and willing to complete it independently

and interviewer-administered when assistance was required. Completion time varied according to the detail provided in open-ended responses; participants were not rushed and could pause or discontinue the assessment. Partners were interviewed separately for sensitive domains, including accusations, sexual relationships, substance use, violence, self-harm and suicidal ideation, to reduce the influence of one partner's presence on the other's disclosure. Interviewers used neutral clarification where responses were unclear and documented refusals, non-applicable items and uncertain responses rather than inferring answers.

2.4 Data analysis and mixed-methods integration

Descriptive analysis summarised participant characteristics and the main study constructs. Frequencies and percentages were reported for categorical variables. Continuous and composite variables were summarised using means, standard deviations, observed ranges, skewness and kurtosis. Coded domain means were interpreted according to the final five-point intensity rubric rather than as direct agreement responses. Ranks were used to compare the relative prominence of psychosocial and psychoeducation domains, while distributional statistics were used to assess the shape and variability of the scores.

The psychosocial-influence component assessed the psychosocial influence of infertility. Frequencies, percentages, means and standard deviations were used to describe coded treatment distress, cultural pressure, stigma, marital strain, economic burden, negative self-perception, social isolation and mental-health manifestations. An independent-samples t-test compared psychosocial-influence scores by gender, while one-way analysis of variance compared the four age groups. Pearson correlation assessed linear relationships involving age, treatment duration and psychosocial influence, with non-parametric alternatives considered where assumptions were not met. Chi-square analysis examined associations between selected categorical support and distress variables. Multiple linear regression then assessed the combined contribution of a limited set of theoretically justified predictors to psychosocial influence.

The psychoeducation component assessed the importance of psychoeducation within psychosocial management. Descriptive statistics summarised recognition of psychological effects, treatment information, stress-management knowledge, communication and support, correction of misconceptions, professional help-seeking and adaptive coping. Correlation analysis examined relationships among psychoeducation, coping and psychosocial influence. Group comparison assessed whether psychoeducation scores differed by educational level,

and multiple regression examined predictors of adaptive coping. The qualitative strand identified knowledge gaps, desired psychoeducational content and preferred forms of support. Because the study did not include a psychoeducational intervention or control group, these analyses were not interpreted as evidence of an intervention effect.

The psychosocial-assessment component examined the preliminary usefulness of the psychosocial assessment approach for identifying stress- and depression-related manifestations. Analysis included completion and scoring distributions, Cronbach's alpha, corrected item-total statistics, the Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity. Exploratory principal-component analysis was used to examine whether the selected core domains showed a distinguishable structure. Binary logistic regression assessed which contextual variables were associated with classification as high psychosocial distress, with odds ratios and 95% confidence intervals reported. The high-distress classification was treated as an analytical screening outcome rather than a clinical diagnostic endpoint.

All inferential tests were two-tailed unless otherwise specified. Statistical significance was assessed at $\alpha = 0.05$, and exact p-values, effect sizes and confidence intervals were reported where appropriate. Statistical significance was not treated as sufficient evidence of practical importance, and a non-significant result was not interpreted as proof that no association existed. Effect-size measures included Cohen's d for mean differences, eta squared for ANOVA, r for correlations, Cramer's V for chi-square analyses, adjusted R² and standardised coefficients for linear regression, and odds ratios for logistic regression.

Qualitative responses were analysed using reflexive thematic analysis informed by Braun and Clarke (2006, 2021). Responses were read and reread, checked against the original instruments where transcription was unclear, and coded for meaningful content. Attention was directed to treatment experiences, cultural expectations, stigma, marriage, sexuality, financial burden, religion, coping, distress, self-harm, psychoeducation and support. Coding combined deductive attention to the study objectives and theoretical framework with inductive openness to unanticipated ideas. MAXQDA 2020 was used to organise the qualitative material, retrieve illustrative extracts and compare themes across relevant participant categories.

Integration occurred at the design, methods and interpretation levels. At the design level, the same study objectives guided both strands. At the methods level, selected open-ended evidence informed both thematic analysis and carefully documented ordinal coding, while demographic variables were analysed quantitatively. At the interpretation level, numerical results were considered alongside relevant qualitative explanations. For example, high stigma

scores were interpreted with accounts of blame and exclusion; family-support findings were considered alongside descriptions of assistance or isolation; and psychoeducation scores were interpreted with requests for treatment and mental-health information. Convergence, complementarity and divergence were retained through joint interpretation. Where numerical and narrative findings differed, the discrepancy prompted contextual examination and consideration of alternative explanations rather than removal of contradictory evidence (Fetters et al., 2013).

2.5 Ethical considerations

Ethical approval for research involving human participants was granted through Ahfad University for Women, together with the required administrative permission for study activities in Juba. The approved procedures addressed informed consent, private administration, de-identification of data, use of anonymised quotations and management of psychological or safety risks. Material changes to recruitment, the assessment instrument or the self-harm response procedure required appropriate academic and ethical review before implementation. The study was guided by the principles of respect for persons, beneficence, non-maleficence, justice and scientific integrity (CIOMS, 2016; World Medical Association, 2013).

Participation was voluntary. Prospective participants were informed about the study objectives, procedures, expected time commitment, potential risks or discomforts, confidentiality safeguards, planned analyses and the possible use of anonymised quotations. They were assured that participation, refusal or withdrawal would not affect medical care, access to services or community standing. Participants could also decline individual questions without withdrawing from the entire study. Written informed consent was obtained before participation, and separate permission was sought for the use of anonymised quotations.

Assessments were conducted privately, and partners were interviewed separately for sensitive domains. Gatekeepers and clinical staff did not have access to individual responses without the participant's consent. Identifiers were separated from analytical data, and participant codes were used in datasets and reports. Findings concerning self-harm, sexual relationships, stigma and family conflict were reported in aggregate or with carefully anonymised quotations so that combinations of information did not reveal identity. Limits to confidentiality were explained in advance, including circumstances in which disclosure might be necessary to protect a participant or another person from imminent serious harm.

Direct questions about self-harm and suicidal ideation created an ethical obligation to respond to possible risk. A positive or unclear response therefore triggered further private assessment rather than being treated solely as a research item. The interviewer paused the routine assessment, clarified the nature and immediacy of the thoughts, considered intent, plan, access to means, previous attempts and protective factors, and contacted an appropriate mental-health professional where required. Participants judged to be at imminent risk were not left without support and were referred for urgent professional or emergency intervention. Where risk was not imminent, the response plan included safety planning, referral information and appropriate follow-up. Relevant contacts and responsibilities were established before data collection began.

The mitigation measures reduced but did not eliminate the study's methodological limitations. In particular, the non-probability sample of 100 participants could not be assumed to represent all couples experiencing infertility in Juba or South Sudan, and the cross-sectional design could not establish that psychoeducation, family support or any other observed factor caused better adjustment. The study's contribution was therefore primarily descriptive, explanatory and service-oriented: it identified patterns, interpreted them alongside participants' accounts and provided a preliminary evaluation of a broad psychosocial assessment approach.

3. Results

3.1 Participant characteristics

All 100 completed study tools were returned and accepted for analysis. The analytical sample comprised 55 women and 45 men. Participants were distributed across the adult life course, with the largest group aged 40-49 years. Most participants identified as Christian, educational backgrounds ranged from no formal education to postgraduate study, and a substantial proportion reported low-income, informal or self-employed livelihoods. Prolonged engagement with infertility care was common: 73% reported treatment durations of six years or longer, including 40% who reported more than ten years.

Table 1. Selected characteristics of the study participants (N = 100)

Characteristic	Category	n	%
Gender	Female	55	55.0
Gender	Male	45	45.0
Age	20-29	13	13.0

Characteristic	Category	n	%
Age	30-39	28	28.0
Age	40-49	34	34.0
Age	50 and above	25	25.0
Religion	Christian	78	78.0
Religion	Muslim	22	22.0
Education	No formal education	9	9.0
Education	Primary education	4	4.0
Education	Secondary education	14	14.0
Education	Certificate/Diploma	34	34.0
Education	Bachelor/Degree	27	27.0
Education	Postgraduate	10	10.0
Education	Other	2	2.0
Economic/employment status	Salaried/working	39	39.0
Economic/employment status	Low income/informal	38	38.0
Economic/employment status	Business/self-employed	17	17.0
Economic/employment status	Not employed	6	6.0
Treatment duration	No treatment/Not stated	10	10.0
Treatment duration	1-5 years	17	17.0
Treatment duration	6-10 years	33	33.0
Treatment duration	More than 10 years	40	40.0

Source: Survey data (2026).

3.2 Psychosocial influence of infertility

Family and community stigma recorded the highest mean ($M = 3.95$, $SD = 0.72$), with 81.0% of participants coded at levels 4 or 5. Treatment-related emotional distress followed closely ($M = 3.89$, $SD = 1.33$), with 78.0% coded at high or very high intensity. Cultural pressure was also high ($M = 3.62$, $SD = 0.93$), while economic burden had a mean of 3.54 ($SD = 1.31$) and mental-health manifestations recorded a mean of 3.53 ($SD = 0.78$). Social isolation was moderate at 3.36 ($SD = 1.07$), negative self-perception was moderate at 2.87 ($SD = 0.84$), and marital or psychosexual strain produced the lowest mean of 2.79 ($SD = 0.89$). The composite

mean was 3.44 (SD = 0.43), indicating a high overall psychosocial influence within the coding framework.

Females had a mean psychosocial influence score of 3.420 (SD = 0.454), compared with 3.472 (SD = 0.403) among males. The mean difference was -0.052. The difference was not statistically significant, $t(97.32) = -0.603$, $p = 0.548$, and the effect size was negligible (Cohen's $d = -0.120$).

Participants aged 40-49 years recorded the highest mean psychosocial influence ($M = 3.551$, $SD = 0.324$), followed by those aged 30-39 years ($M = 3.478$, $SD = 0.448$), those aged 50 years and above ($M = 3.445$, $SD = 0.451$) and participants aged 20-29 years ($M = 3.087$, $SD = 0.458$). The age-group difference was statistically significant, $F(3, 96) = 4.102$, $p = 0.009$, with $\eta^2 = 0.114$, indicating that approximately 11.4% of the variance in psychosocial influence was associated with age-group membership.

A weak positive but statistically non-significant relationship between age and psychosocial influence, $r = 0.161$, $p = 0.110$. Treatment duration had a weak positive and statistically significant relationship with psychosocial influence, $r = 0.219$, $p = 0.028$. Longer engagement with infertility treatment was therefore associated with a gradual increase in psychosocial burden.

51 of the 83 participants without regular family financial support were classified in the higher-distress group, compared with 5 of the 17 participants who received regular support. The association was statistically significant, $\chi^2(1) = 5.876$, $p = 0.015$, with Cramer's $V = 0.242$, representing a small-to-moderate association.

The regression model was statistically significant, $F(8, 91) = 6.234$, $p < 0.001$, and explained 35.4% of the variance in psychosocial influence (adjusted $R^2 = 0.297$). Economic burden was the strongest significant predictor ($\beta = 0.399$, $p < 0.001$), followed by treatment duration ($\beta = 0.258$, $p = 0.004$) and family or community stigma ($\beta = 0.235$, $p = 0.008$). Age, gender, family-support deficit, adaptive coping and the psychoeducation index were not independent predictors after the other variables were controlled.

The qualitative responses were coded into recurrent themes of treatment distress, cultural pressure, stigma, economic strain, reduced self-worth, marital change and social withdrawal. The principal themes were reinforced by participants' accounts.

The quotations showed that participants interpreted infertility through a combination of personal disappointment and socially imposed meanings. Stress and hopelessness were

intensified when treatment failed, while gendered blame, accusations of curses and financial constraints extended distress beyond the clinic. The testimony concerning reduced sexual interest also demonstrated how the expectation of conception could transform intimacy into another source of pressure.

*“The treatment processes are full of stress and feelings of hopelessness.”
(Participant BENA-08)*

“Frustrating when expected results are not achieved; it is costly and sometimes difficult because of lack of money.” (Participant BENA-13)

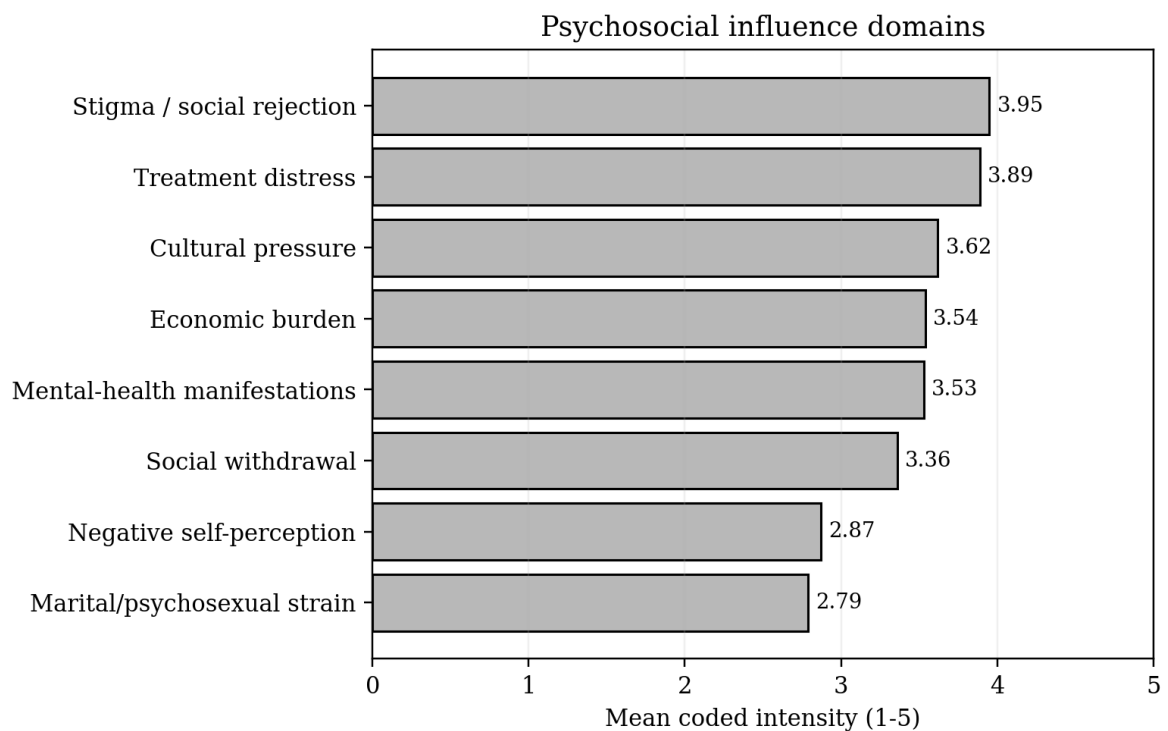
“Community sees reproductive problems as women’s issues; men are not blamed.” (Participant BENA-16)

Table 2. Psychosocial influence domains

Domain	N	Mean	SD	Interpretation
Family/community stigma	100	3.95	0.72	High
Treatment-related emotional distress	100	3.89	1.33	High
Cultural pressure	100	3.62	0.93	High
Economic burden	100	3.54	1.31	High
Mental-health manifestations	100	3.53	0.78	High
Social withdrawal	100	3.36	1.07	Moderate
Negative self-perception	100	2.87	0.84	Moderate
Marital/psychosexual strain	100	2.79	0.89	Moderate
Composite psychosocial influence	100	3.44	0.43	High

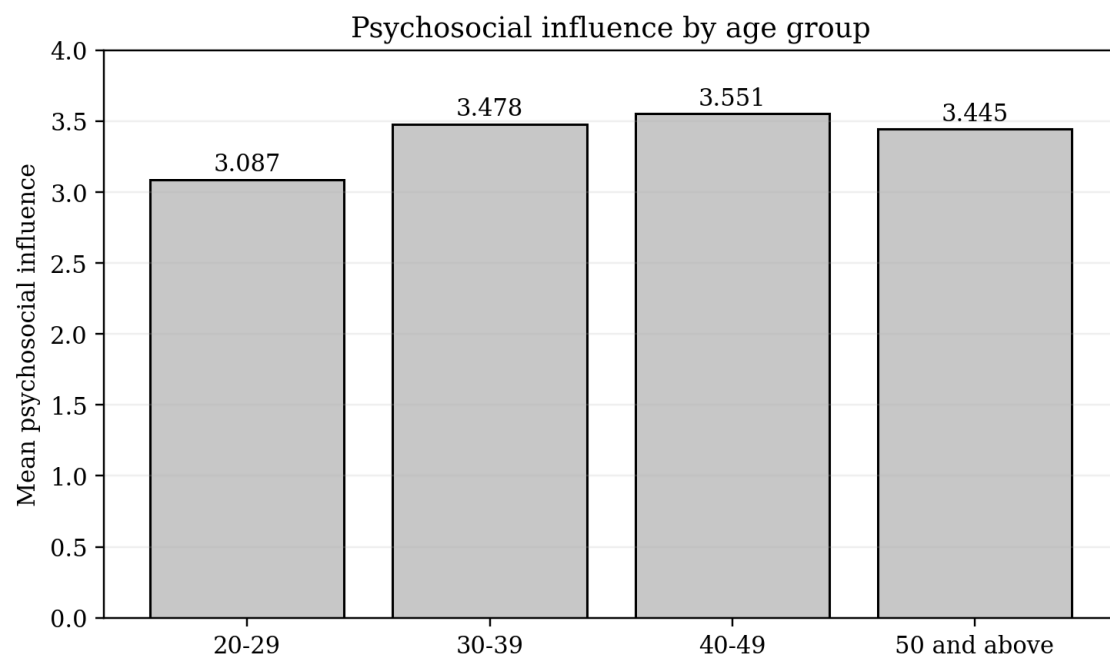
Source: Survey data (2026).

Figure 1. Mean scores for the psychosocial influence domains



Source: Survey data (2026).

Figure 2. Mean psychosocial influence by age group



Source: Survey data (2026).

Table 3. Multiple regression predictors of psychosocial influence

Predictor	B	β	p	95% CI for B	Decision
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Predictor	B	β	p	95% CI for B	Decision
Constant	1.401	—	0.001	[0.554, 2.248]	Significant
Age	0.002	0.038	0.684	[-0.007, 0.010]	Not significant
Female gender	0.016	0.019	0.831	[-0.137, 0.170]	Not significant
Treatment duration	0.021	0.258	0.004	[0.007, 0.035]	Significant
Family/community stigma	0.142	0.235	0.008	[0.038, 0.245]	Significant
Economic burden	0.131	0.399	<0.001	[0.068, 0.194]	Significant
Family-support deficit	0.013	0.026	0.791	[-0.086, 0.113]	Not significant
Adaptive coping	0.095	0.178	0.068	[-0.007, 0.197]	Not significant
Psychoeducation index	0.077	0.077	0.431	[-0.116, 0.270]	Not significant

Model: $R^2 = 0.354$; adjusted $R^2 = 0.297$; $F(8, 91) = 6.234$; $p < 0.001$. Source: Survey data (2026).

3.3 Psychoeducation and adaptive coping

Recognition of the psychological consequences of infertility recorded the highest mean ($M = 4.61$, $SD = 0.63$), with 97.0% of participants coded at levels 4 or 5. Adaptive coping and resilience followed with a mean of 4.47 ($SD = 0.81$), while stress-management knowledge had a mean of 4.12 ($SD = 1.27$). Treatment information was rated highly ($M = 3.90$, $SD = 0.85$), as was communication and social support ($M = 3.80$, $SD = 1.22$). Correcting myths and community misconceptions produced a moderate mean of 3.36 ($SD = 0.70$), and professional help-seeking had a mean of 3.30 ($SD = 0.82$). The composite psychoeducation mean was 3.94 ($SD = 0.43$), indicating high perceived importance within the coding framework.

A moderate positive relationship between psychoeducation and adaptive coping, $r = 0.460$, $p < 0.001$. Psychoeducation also had a weak positive relationship with the psychosocial influence score, $r = 0.227$, $p = 0.023$. The first relationship indicated that stronger psychoeducational awareness was associated with more developed coping responses. The second suggested that participants with greater distress may also have sought or developed more psychological knowledge.

Participants with bachelor's or postgraduate education had a mean psychoeducation score of 3.846 ($SD = 0.430$), while those below bachelor's level had a mean of 3.991 ($SD = 0.428$). The difference was not statistically significant, $t = -1.633$, $p = 0.107$, with a small effect size ($d = -0.339$).

The model was statistically significant, $F(5, 94) = 5.796$, $p < 0.001$, and explained 23.6% of the variance in adaptive coping. Psychoeducation was the only significant predictor ($\beta = 0.445$, $B = 0.832$, $p < 0.001$). Family-support deficit, educational level, age and gender did not independently predict coping after psychoeducation was included.

The thematic analysis identified education, counselling, awareness creation, stress-management knowledge, treatment information, family support and hope as the main psychoeducation needs. The themes were reinforced by participants' accounts.

The quotations indicated that participants did not view psychoeducation as classroom instruction alone. They associated it with practical information, counselling, community awareness, emotional support, hope and guidance toward professional services. The references to churches and health workers also suggested that psychoeducation should be delivered through coordinated clinical, community and faith-based channels.

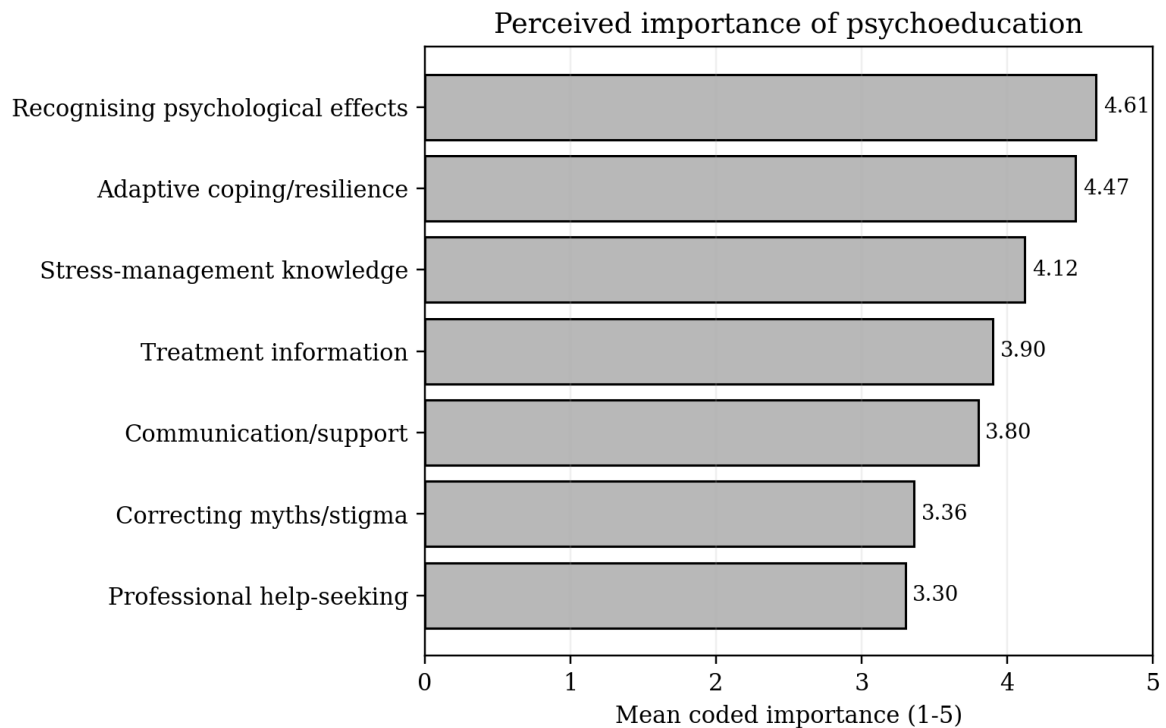
“Counselling and educating couples about infertility can help them manage stress and understand treatment.” (Participant response, 2026)

Table 4. Perceived importance of psychoeducation

Psychoeducation function	Mean	SD	Interpretation
Recognising psychological consequences	4.61	0.63	Very high
Adaptive coping/resilience	4.47	0.81	Very high
Stress-management knowledge	4.12	1.27	High
Treatment information	3.90	0.85	High
Communication/support	3.80	1.22	High
Correcting myths/stigma	3.36	0.70	Moderate
Professional help-seeking	3.30	0.82	Moderate
Composite importance of psychoeducation	3.94	0.43	High

Composite $M = 3.94$, $SD = 0.43$; psychoeducation-coping $r = 0.460$, $p < 0.001$. In the multivariable coping model, psychoeducation was the only significant predictor ($\beta = 0.445$, $p < 0.001$). Source: Survey data (2026).

Figure 3. Mean scores for the perceived importance of psychoeducation



Source: Survey data (2026).

3.4 Psychosocial assessment and identification of high distress

Treatment-related emotional distress recorded the highest mean of 3.89 (SD = 1.33), followed by mental-health manifestations with a mean of 3.53 (SD = 0.78). Negative self-perception recorded a moderate mean of 2.87 (SD = 0.84), while marital and psychosexual strain had a mean of 2.79 (SD = 0.89). The assessment approach therefore detected pronounced treatment-related distress and mental-health manifestations while also distinguishing lower and more variable levels of negative self-perception and marital strain.

An overall Cronbach's alpha of 0.463. Corrected item-total correlations ranged from 0.202 to 0.373. Treatment-related emotional distress made the strongest contribution to the total score, while the alpha values obtained after deleting individual items remained below 0.45. The internal consistency was consequently below the conventional 0.70 criterion.

A KMO value of 0.589, indicating marginal sampling adequacy, while Bartlett's test was significant, $\chi^2(6) = 19.390$, $p = 0.004$. The two components explained 62.8% of the variance. Marital strain and treatment distress loaded more strongly on the first component, while observable mental-health manifestations loaded strongly on the second. Negative self-perception contributed to both components.

The logistic model was significant, likelihood-ratio $\chi^2(8) = 39.262$, $p < 0.001$, with Nagelkerke $R^2 = 0.434$ and overall classification accuracy of 71.0%. Each additional year of treatment increased the odds of high distress by approximately 15.6% ($OR = 1.156$, $p = 0.004$). Higher stigma nearly tripled the odds of high distress ($OR = 2.987$, $p = 0.008$), while economic burden approximately doubled the odds ($OR = 2.039$, $p = 0.004$). Family-support deficit approached statistical significance ($p = 0.053$).

Treatment duration, stigma and economic burden contributed significantly to the model distinguishing participants classified as having high psychosocial distress. These variables can be identified during routine history-taking and may help to prioritise further psychosocial assessment, counselling and referral. The absence of significant independent effects for age and gender also suggested that screening should not be restricted to demographic groups assumed in advance to be vulnerable.

The qualitative responses illustrated the symptoms detected by the tool and the coping or referral actions participants considered useful. The main themes were reinforced by participants' accounts.

The quotations demonstrated that the assessment tool elicited both symptoms and management resources. Participants described emotional, behavioural and physical manifestations of distress, including poor sleep, low energy, restlessness, isolation and low self-esteem. They also identified protective actions such as self-care, exercise, counselling, psychoeducation and social support. This combination enhanced the practical value of the tool because it did not merely identify distress but also generated information for individualised management planning.

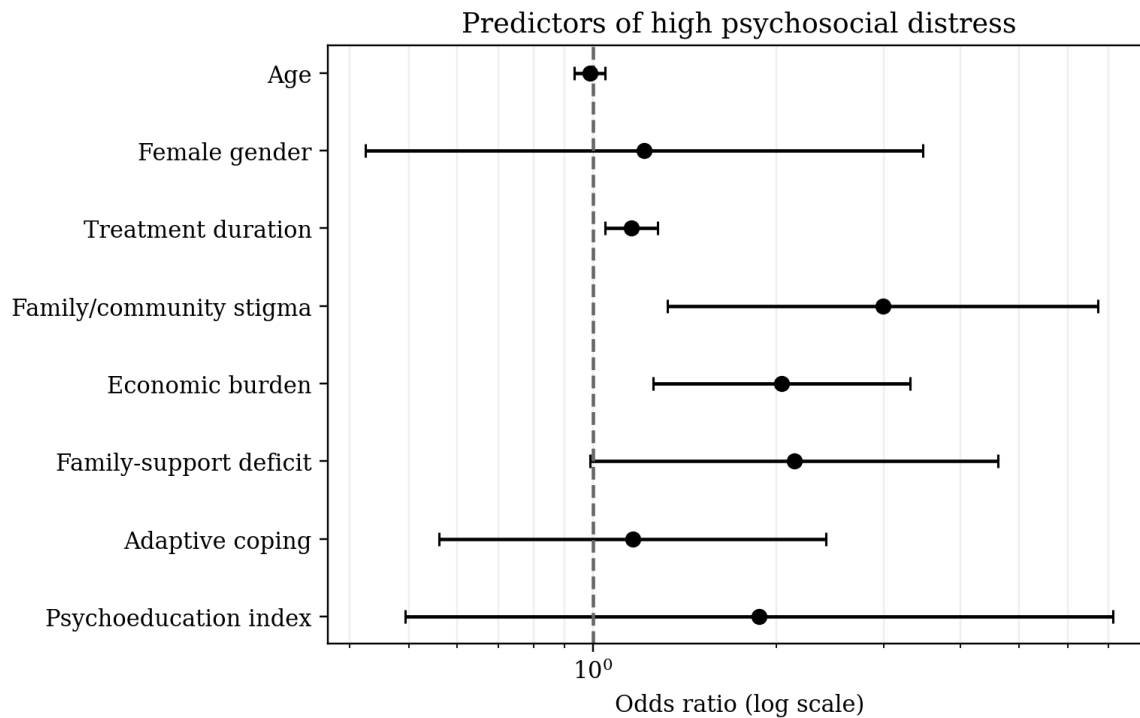
Table 5. Performance of the psychosocial assessment approach

Indicator	Statistic	Result	Interpretation
Internal consistency	Cronbach's α	0.463	Below conventional 0.70 threshold; domains should not be collapsed into one validated scale
Sampling adequacy	KMO	0.589	Marginally adequate
Factorability	Bartlett $\chi^2(6)$	19.390; $p = 0.004$	Significant factorability
Exploratory structure	Two components	62.8% variance	Relational/treatment burden and emotional manifestation
High-distress model	Nagelkerke R^2	0.434	Model significant; 71.0% classification accuracy
Treatment duration	OR (95% CI)	1.156 (1.047-1.277)	$p = 0.004$

Indicator	Statistic	Result	Interpretation
Family/community stigma	OR (95% CI)	2.987 (1.324-6.736)	p = 0.008
Economic burden	OR (95% CI)	2.039 (1.255-3.314)	p = 0.004

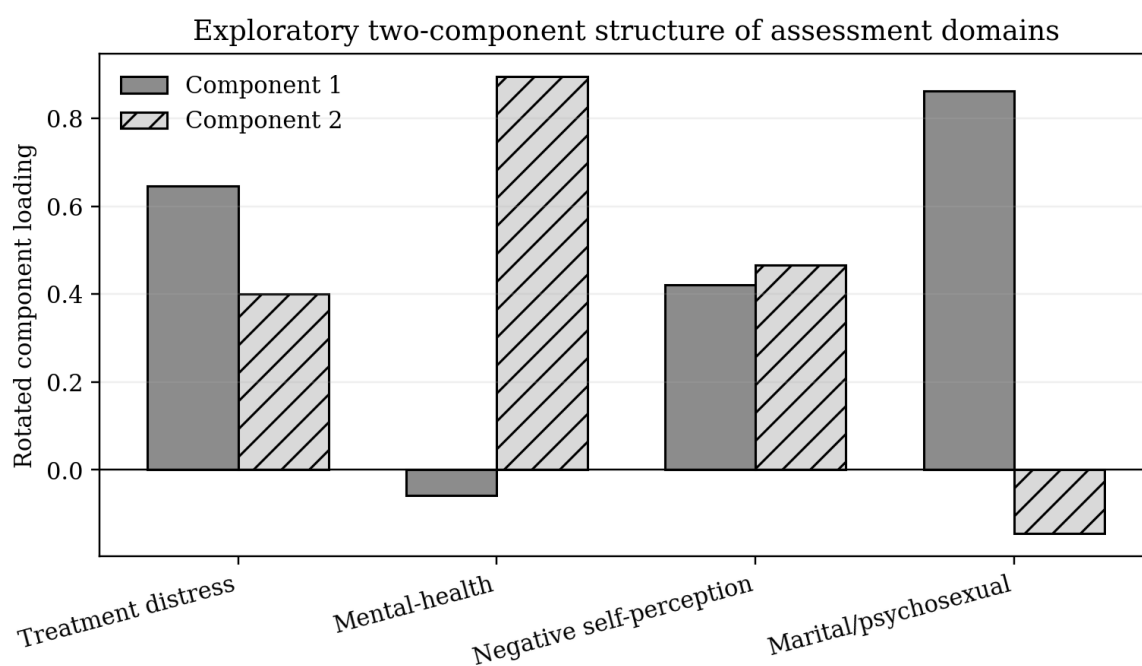
Source: Survey data (2026).

Figure 4. Odds ratios for high psychosocial distress



Source: Survey data (2026).

Figure 5. Exploratory two-component loadings of the core assessment domains



Source: Survey data (2026).

3.5 Integrated mixed-methods interpretation

Substantial convergence between the two strands. The highest quantitative domains-stigma, treatment distress and economic burden-were repeatedly represented in the participants' language. The strong psychoeducation and coping relationship was similarly explained by accounts of counselling, information, prayer, self-care and social support. The qualitative findings also clarified the low reliability of the broad tool by showing that it intentionally captured diverse emotional, relational, social and practical experiences rather than a single symptom dimension.

The integrated analysis established that infertility among couples in Juba was a multi-level psychosocial condition. Effective management would require attention to individual emotional symptoms, couple relationships, family support, community beliefs, treatment affordability and knowledge. This conclusion corresponded with the holistic psychosocial framework proposed by Gameiro et al. (2015) and the multidimensional quality-of-life approach developed by Boivin et al. (2011).

4. Discussion

The study established that infertility was not experienced as an isolated medical diagnosis. Participants connected it with stress, uncertainty, reduced hope, economic difficulty, social comparison, family pressure and changes in marital life. This multidimensional pattern supported the conceptual position developed in the reviewed literature, which defined psychosocial influence as the interaction between internal psychological processes and the social environments in which infertility acquired meaning. A failed treatment attempt could therefore be interpreted simultaneously as a medical disappointment, a financial loss, a threat to marriage and a public confirmation that the couple had not fulfilled expected family roles.

Family and community stigma emerged as one of the clearest influences. Participants described infertility through labels such as curse, sickness, inherited problem or evidence of personal failure. Women were often exposed to direct blame because pregnancy is visible in the female body, even where the cause of infertility had not been medically established. Men could also experience threats to masculine identity, lineage and social recognition, although these experiences were sometimes expressed less openly. The findings showed that biomedical knowledge had not displaced cultural and moral explanations; instead, couples

could move between medical, religious, family and traditional interpretations at the same time.

Treatment-related distress was strongly expressed in the participants' accounts. Repeated consultations, medication, surgery, delayed results and uncertainty made treatment emotionally demanding even when participants remained hopeful. The burden increased when treatment continued for years without a clear outcome. This finding supported the transactional view that stress develops when demands are appraised as exceeding available resources. A treatment procedure was therefore not stressful only because it was medically invasive; it became more difficult when it required unaffordable expenditure, repeated travel, absence from work or renewed exposure to disappointment.

The analysis did not support a simple conclusion that infertility affected only women or that one gender always experienced a greater overall burden. Instead, the qualitative evidence indicated different forms of exposure. Women were more likely to describe visible blame, rejection, accusations and threats to their identity as mothers. Men could experience concern about lineage, masculinity, treatment financing and public recognition. This distinction was consistent with Hanna and Gough (2020), who showed that male infertility may be negotiated through secrecy, distancing and challenges to masculine identity, and with Dyer et al. (2004), who demonstrated the social importance of fatherhood among men experiencing infertility.

Participants reported emotional and behavioural experiences that included sadness, anxiety, hopelessness, irritability, poor sleep, low energy, withdrawal and reduced self-esteem. These findings agreed with the international evidence synthesised by Salari et al. (2024) and Fallahzadeh et al. (2019), which showed a substantial burden of depression, anxiety and stress among people experiencing infertility. However, the study appropriately distinguished reported symptoms from a formal psychiatric diagnosis. The findings indicated a need for screening and referral, not the assumption that every participant with sadness met diagnostic criteria for a depressive disorder.

The identification of self-harm or suicidal thoughts, even among a small number of participants, was clinically significant. Infertility should not be portrayed as automatically producing suicidal behaviour, but severe hopelessness, depression, relationship disruption and financial strain can create risk in vulnerable individuals. Shani et al. (2016) similarly identified suicidal risk among women undergoing in-vitro fertilisation and emphasised the importance of recognising depressive symptoms and maladaptive coping.

The study showed that couples required accurate information about infertility, but information alone was insufficient. Participants also needed help to interpret emotional reactions, prepare for uncertainty, understand treatment limitations and recognise when distress required professional support. This finding was consistent with Cousineau et al. (2008), who demonstrated that a structured psychoeducational programme could improve knowledge and selected psychosocial outcomes, and with Gameiro et al. (2015), who positioned information and communication within routine psychosocial care.

The relationship between psychoeducation and adaptive coping supported the transactional theory of stress and coping. Psychoeducation can strengthen secondary appraisal by increasing the couple's knowledge of options, available support and likely treatment experiences. When people understand what is happening and what responses are available, infertility may remain painful but become less unpredictable. This does not remove the biological problem; it increases the resources available for managing it.

Psychoeducation was also important for couple communication. Infertility can produce different coping styles within the same relationship: one partner may seek information and discussion, while the other withdraws or focuses on practical action. Without explanation, these differences may be interpreted as lack of care. Couple-focused psychoeducation can normalise different responses, encourage stress communication and support shared decision-making about treatment, finances and disclosure to relatives.

The social origins of stigma meant that couple-only psychoeducation would be incomplete. Family members and community actors influenced whether participants received support or experienced blame. A culturally responsive programme should therefore include optional family sessions, community dialogues and engagement with religious leaders. The purpose would not be to disclose private clinical information but to correct general misconceptions, explain that infertility can affect either partner, discourage ridicule and promote supportive communication.

The assessment tool covered treatment experiences, cultural and religious beliefs, family and community relationships, economic circumstances, physical health, substance use, coping, self-harm and mental-health status. This breadth was a strength because participants' distress was rarely explained by one factor. A person could report sadness together with treatment debt, family criticism and poor spousal communication. A narrow symptom scale might identify distress without explaining the context in which it developed.

The broad coverage also created a measurement limitation. Emotional distress, marital strain, stigma, economic burden and coping are related but distinct constructs. They should not automatically be combined into one total score. The internal-consistency results in the results supported this interpretation by showing that the domains did not behave as interchangeable items measuring one narrow concept. The appropriate conclusion was therefore that the tool functioned as a comprehensive assessment schedule rather than a single psychometric scale.

The tool should be used within a stepped assessment model. Universal screening could begin with brief questions concerning treatment burden, mood, anxiety, stigma, family support and safety. Participants with elevated concerns could then receive a more detailed infertility-specific assessment and clinical interview. Established instruments such as the PHQ-9, DASS-21, FertiQoL or COMPI scales may be considered after cultural adaptation and validation. A positive screening result should trigger further assessment rather than be treated as a diagnosis.

Questions about sexuality, self-harm and suicidal ideation required privacy and trained administration. Joint couple interviews may be useful for shared experiences but may suppress disclosure where there is blame, conflict or fear. The study therefore supported private individual assessment for high-risk domains, with couple sessions added when appropriate and safe. Participants should be informed about the limits of confidentiality where imminent harm is identified.

The findings did not support a simple linear conclusion that psychosocial influence consistently increased with chronological age. Differences were observed among age groups, but treatment duration, stigma, financial pressure and coping provided stronger explanations of individual distress. The hypothesis was therefore only partly supported. Age remained relevant because reproductive time and family expectations can intensify concern, but it should not be used as a substitute for direct psychosocial assessment.

The findings supported the proposition that psychoeducation was associated with better psychosocial adjustment, particularly through coping and stress-management knowledge. The relationship did not mean that information alone removed distress. Rather, psychoeducation appeared to strengthen resources that helped couples interpret treatment, communicate and use support. This conclusion was consistent with the transactional theory, which places knowledge and perceived resources within secondary appraisal.

The study contributed context-specific evidence from Juba, a setting that was underrepresented in the infertility literature reviewed in the reviewed literature. African

evidence was concentrated in a small number of countries, and research from South Sudan rarely integrated infertility, mental health, couple relationships, culture, economic conditions and psychoeducation. This study therefore extended the geographical coverage of psychosocial infertility research.

The study also contributed a couple-oriented perspective. Much previous African research focused mainly on women, although infertility affects both partners and one partner's coping can influence the other. By including men and women and examining relational experiences, the study highlighted both shared burden and gendered forms of blame, identity threat and treatment responsibility.

Methodologically, the study demonstrated the value of combining coded quantitative analysis with open-ended accounts. The statistical analysis identified broad patterns and influential factors, while participants' narratives explained how treatment, stigma, faith, family expectations and economic pressure were experienced. This integration reduced the risk of treating distress scores as complete explanations of the couple's situation.

Finally, the study generated a practical basis for developing locally appropriate psychosocial care. It identified the need for routine screening, psychoeducation, couple-sensitive counselling, family and community engagement and referral. It also clarified that a broad assessment tool can be clinically informative without yet functioning as a fully validated psychometric scale.

Infertility care should include psychosocial assessment from the beginning of treatment. Clinicians should not wait for visible emotional crisis before discussing stress, coping, relationships and support. Respectful communication, realistic preparation and routine review can reduce avoidable treatment burden and improve the couple's capacity to make informed decisions.

Services should be organised around a stepped model that begins with universal information and screening, proceeds to brief counselling for participants with elevated needs and provides specialist referral for severe or complex problems. This approach is more feasible in a resource-constrained setting than expecting every couple to receive long-term psychotherapy.

Because stigma and family pressure contributed to distress, public-health intervention should extend beyond clinics. Community and faith-based education can reduce blame, normalise joint assessment and encourage supportive responses. Messages should avoid exposing individual couples or simplifying infertility into a single cause.

The findings supported an integrated theoretical position. The biopsychosocial model identified the interacting domains, the transactional theory explained how demands and resources shaped distress, and dyadic coping explained how partners influenced each other. No single framework fully explained the findings, but together they provided a coherent account of biological treatment, psychological appraisal and social relationships.

5. Conclusion and Implications

Infertility among adults in couple relationships in Juba emerged as a multidimensional biopsychosocial experience rather than a reproductive diagnosis with incidental emotional effects. Stigma, treatment-related emotional distress, cultural pressure and economic burden were prominent, and prolonged treatment exposure, stigma and economic burden were the clearest independent predictors of psychosocial influence. The findings also showed that psychoeducation was not simply an informational add-on: it was strongly valued, was moderately associated with adaptive coping and remained the only significant predictor of coping after demographic and family-support factors were controlled. Broad psychosocial assessment identified meaningful emotional, relational and contextual risk, but the modest internal consistency and marginal factorability require caution; the assessment should be refined into distinct validated domains and should complement, rather than replace, established depression, anxiety and infertility-related stress measures.

For practice, reproductive-health services in Juba should integrate routine psychosocial screening, structured psychoeducation, couple-sensitive counselling and clear referral pathways throughout the infertility journey. Screening should not be restricted to groups presumed to be vulnerable on the basis of age or gender alone. Family and community engagement is also important because some of the most powerful stressors originated outside the clinic through blame, stigma, financial pressure and expectations surrounding marriage and parenthood. A stepped-care model - universal information and brief screening for all, targeted counselling for elevated needs and specialist referral for severe or complex distress - offers a feasible service framework for a resource-constrained setting.

6. Study Limitations

The cross-sectional design limited causal interpretation. The study identified associations and recurring experiences but could not determine whether particular social conditions caused psychological distress or whether distress altered the way participants perceived those

conditions. Longitudinal research would be required to establish changes over the course of treatment.

The study relied substantially on self-reported information. Infertility, sexuality, family conflict, substance use and self-harm are sensitive topics, and participants may have withheld information or provided socially acceptable responses. Confidential administration and open-ended questions reduced this limitation but could not eliminate it.

The broad assessment tool had limited psychometric standardisation. Its open-ended format captured context but required researcher coding, which may introduce interpretation differences. The study therefore treated the tool as a comprehensive psychosocial assessment rather than a definitive diagnostic instrument.

The sample was drawn from participants accessible within the study setting and should not be treated as nationally representative of all couples experiencing infertility in South Sudan. Couples who had not sought care, lived outside Juba or were unwilling to disclose infertility may have different experiences.

The couple focus was conceptually important, but the dataset did not permit full dyadic modelling of matched partners in every case. Future studies should recruit identifiable partner pairs while maintaining privacy and safety so that actor and partner effects can be analysed directly.

7. Recommendations

1. Infertility services should incorporate brief confidential screening for treatment burden, depressive and anxiety-related symptoms, stigma, relationship strain, family support and self-harm risk at entry to care and at clinically important transition points.
2. Structured psychoeducation should be delivered to both partners and should cover infertility causes, treatment processes, emotional reactions, coping, communication, realistic expectations, costs and routes to professional support.
3. Providers should develop stepped referral pathways linking reproductive-health staff with counsellors, psychologists, psychiatrists and other mental-health services, with explicit emergency procedures for self-harm or suicide risk.
4. Community and faith-based education should reduce gendered blame, myths and social exclusion while respecting couples' privacy and diverse religious interpretations.

5. The broad psychosocial assessment used in this study should be separated into theoretically coherent subscales, translated and culturally adapted, and subjected to larger independent reliability, validity and threshold studies before routine clinical scoring.
6. Future research should include longitudinal and matched-couple designs so that changes across treatment and actor-partner effects can be analysed directly.

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