Critical Realist Perspective about Pakistani Men Becoming a Father for the First Time: A Multi-Method Study

Sadaf Sadruddin Kamwani

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Preface

Contribution of Collaborators

Elements	Chapter One	Chapter Two	Chapter Three	Chapter Four	Chapter Five
Supervision	JCP	JCP	JCP	JCP	JCP
Advice			JCP, JC, JH		
Conceptualize, design, and review			JCP, JC, JH		
Assistance with search strategy	---	MD	---	---	---
Title and abstract screening by second reviewer	---	JCP	---	---	---
Assistance with protocol registration	---	JC	---	---	---
Assistance with developing / organizing / coding / analyzing material	---	JCP, JC, JH	JCP	JCP	JCP
Auditing data analysis, levels of abstraction and interpretation			JCP, JC, JH		
Revision of manuscripts and chapters			JCP, JC, JH		
Approval of final version			JCP, JC, JH		

JCP: J. Craig Phillips, Professor, School of Nursing, University of Ottawa, Ontario, Canada.

JC: Julie Chartrand, Associate Professor, School of Nursing, University of Ottawa, Ontario, Canada.

JH: Jean Hannan, Associate Professor, Nicole Wertheim College of Nursing & Health Sciences, Florida International University, Miami, USA.

MD: Marie-Cecile Domecq, Librarian, Health Sciences Library, University of Ottawa, Ontario, Canada.

Thesis Abstract

Background: In Pakistan, and globally, first-time fathers may experience psychological distress during their wives' perinatal period. Causal mechanisms for this distress may be enmeshed in their roles within socio-ecological layers where they live.

Research Purpose: This study explored the experiences of men in Pakistan becoming fathers for the first time and identified causal mechanisms behind their perinatal experiences in Pakistani society.

Methods: A biphasic multi-method research approach was used to explore three research questions: (1) What evidence is available about factors contributing to paternal perinatal psychological distress (PPPD) in first-time fathers? (2) What are the experiences of men becoming first-time fathers in Pakistan? (3) What are the causal mechanisms behind these experiences? Phase 1 was a scoping review of instruments to measure men's psychological distress during the perinatal period. Phase 2, a qualitative descriptive study, was guided by Critical Realism (CR) philosophy and the Socio-Ecological Model (SEM), offering a roadmap for mitigating risk factors for developing PPPD in first-time fathers. Qualitative face-to-face individual interview data was analyzed by integrating Inductive Content Analysis (ICA) technique with CR philosophy and the SEM.

Results: The scoping review included 16 studies and identified 56 instruments that measure aspects of men's experiences with PPPD. Causal mechanisms behind perinatal experiences of first-time fathers (n = 8; 4 prenatal, 4 postnatal) in SEM layers in Pakistan include personal values (individual layer), affection for wives (relationship layer), teachings at religious settings (community layer), and norms and policies of hospitals and Pakistani society (societal layer).

Conclusions: This study provides evidence of the need to assess, and when appropriate treat, first-time fathers for PPPD during their wives' perinatal period. Mobilizing healthcare professionals, researchers, and policymakers across SEM layers may offer the best hope for recognizing and managing PPPD among first-time fathers, improving health for them, their families, and communities.

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Glossary of Terms

AEE: Attitude towards Emotional Expression

ATSDR: Agency for Toxic Substances and Disease Registry

AUDIT: Alcohol Use Disorders Identification Test

CAGE: Cutdown, Annoyed, Guilty, and Eye-Opener

EPQ: Eysenck Personality Questionnaire

BDI: Beck Depression Inventory

BDI-SF: Beck Depression Inventory – Short Form

BSRI: Bem Sex-Role Inventory

CAB: Community Advisory Board

CAD$: Canadian Dollar

CDC: Centers for Disease Control and Prevention

CEO: Chief Executive Officer

CES-D: Center for Epidemiological Studies – Depression Scale

CINAHL: Cumulative Index to Nursing and Allied Health Literature

CR: Critical Realism

DAS: Dyadic Adjustment Scale

DSM: Diagnostic and Statistical Manual of Mental Disorders

DSM-5-TR: Fifth and text-revision edition of the Diagnostic and Statistical Manual of Mental Disorders

DSQ: Defense Style Questionnaire

EMBASE: Excerpta Medica Database

EPDS: Edinburgh Postnatal Depression Scale

ESI: Everyday Stressors Index

FAD-GF: Family Assessment Device – General Function Scale

FHM: Federal Health Ministry

FSSQ: Functional Social Support Questionnaire

GCP: Good Clinical Practice

GCSE: General Certificate of Secondary Education

GHQ: General Health Questionnaire

GSAQ: Global Sleep Assessment Questionnaire

HADS: Hospital Anxiety and Depression Scale

HSCL: Hopkins Symptom Checklist

IBM: Intimate Bond Measure

ICA: Inductive Content Analysis

ID #: Identity Number

IPAQ: International Physical Activity Questionnaire

ISEL: Interpersonal Support Evaluation List

JBI: Joanna Briggs Institute

K6 / K-6 Scale: Kessler Psychological Distress Scale, 6-item version

KMSS: Kansas Marital Satisfaction Scale

LMIC: Low-and-Middle-Income Country

MeSH: Medical Subject Headings

MGRS: Masculine Gender Role Stress Scale

MHI: Mental Health Inventory

MOS-SS: Medical Outcomes Study Social Support Survey

MSc: Master of Science

OSF: Open Science Framework

PANAS: Positive and Negative Affect Scale

PANAS-N: Negative Affect Scale

PANAS-P: Positive Affect Scale

PBI: Parental Bonding Instrument

PCC: Population, Concept, and Context

PhD: Doctorate / Doctor of Philosophy

PHM: Provincial Health Ministry

NGOs: Non-Governmental Organizations

PI: Principal Investigator

PKR: Pakistani Rupee

PP: Postnatal Group

PPPD: Paternal Perinatal Psychological Distress

PPPD: Psychological distress in fathers during the perinatal period of their wives.

PR: Prenatal Group

PSOC: Parenting Sense of Competence

PSQI: Pittsburgh Sleep Quality Index

PSS: Parenting / Parental Stress Scale

PSS: Perceived Stress Scale

QCA: Qualitative Content Analysis

QOL: Global Quality of Life

RAs: Research Associates

RCTs: Randomized Controlled Trials

SAARC: South Asian Association for Regional Cooperation

SAIS: Self-Assessment of Irritability Scale

SBSON: Saifee Burhani School of Nursing

SDG: Sustainable Development Goal

SEI: Self-Esteem Inventory

SEM: Socio-Ecological Model

SHK: Saifee Hospital Karachi

SSQ: Sarason's Social Support Questionnaire

SSRS: Social Support Rating Scale

SSSS: Sarason Social Support Survey

TAC: Thesis Advisory Committee

UK: United Kingdom

USA: United States of America

WBQ: Well-Being Questionnaire

WFC: Work-Family Conflict

WHO: World Health Organization

WHOQOL: World Health Organization Quality of Life

WMA: World Medical Association

Chapter One

Introduction

The overall purpose of this research program was to develop and validate a gender-specific instrument for measuring paternal perinatal psychological distress in first-time Pakistani fathers. For feasibility reasons, tool development and validation will be conducted during postdoctoral studies. For this thesis, the initial phases necessary for tool development have been conducted during doctoral studies. Hence, the first chapter of this doctoral thesis includes a briefing about the background of Pakistani culture / society, research problem, research gap, philosophical and theoretical frameworks that guided this multi-method study, research objectives, and outlines the structure of this manuscript-based thesis.

Background

Aristotle, a Greek philosopher, referred to man as a 'social animal' by nature, who prefers to live in and surrounded by a society rather than being alone (Al-Humaidhi, 2020). While living together in the same society, people develop and follow a common culture of shared beliefs, practices, values, and behaviors (Hwang, 2016). Despite being a vital element for human existence and impacting every area of a human's life, culture is often overlooked by healthcare policymakers (Aubel & Chibanda, 2022; Kagawa Singer et al., 2016).

Pakistan is a low-and-middle-income country and a Muslim state in Southern Asia which gained independence from British rule in 1947 (Pakistan Bureau of Statistics, 2017; Shafiq et al., 2020; The World Bank, n.d.). Despite having a diverse population and various subcultures prevailing in Pakistan, the presence of patriarchal culture is a constant feature of the Pakistani society since pre-partition era (Iqbal, 2017). Male-dominance is currently practiced and accepted widely in the Pakistani society (Lone, 2019; Salam, 2021). On one hand, men assume the roles of

primary breadwinner and head of their family (Cultural Atlas, 2022). On the other hand, society and family also expect men to provide material and financial resources to their family. Joint family system is a prevalent family structure in Pakistan (Lodhi et al., 2021). Being living in Pakistan for four decades, I witnessed that Pakistani men need to present themselves as strong and powerful to maintain their superiority and authority in their families and society.

Research Problem

Life is not linear. Transitions are a natural phenomenon in life. These transitions can be happy, stressful, or both. One of the significant life transitions in men's live is becoming a father for the first time (Clark et al., 2019). Along with bringing joy and happiness, becoming a father for the first time can trigger psychological distress in men during the perinatal period of their wives (Antoniou et al., 2021; Clark et al., 2019; Kumar et al., 2018). However, due to Pakistani societal pressure of presenting themselves as strong authority figures in their families; men are reluctant to accept and seek healthcare for psychological distress if they experience it (Javed et al., 2020). Hence, perinatal psychological distress in men becoming fathers for the first time in Pakistan remained undercover and underreported; despite global studies generating evidence about the presence of psychological distress in men during the perinatal period of their wives (Antoniou et al., 2021; Azzam et al., 2022; Philpott, 2023).

Effects of Paternal Perinatal Psychological Distress

Psychological distress is a collection of broad or common symptoms which are related to stress, anxiety, and depression (Cuijpers et al., 2009). Paternal perinatal psychological distress (PPPD) is a term which was used in this thesis for describing the psychological distress in fathers during the perinatal period of their wives. Numerous socioecological factors that stem from the

individual, their relationships, community, and society affect the health of individuals in multiple ways (Agency for Toxic Substances and Disease Registry - ATSDR, 2018; Kilanowski, 2017). The effects of PPPD are evident at fathers' individual and relationship levels. On the individual level, PPPD affects the mental wellbeing of a father (Canadian Mental Health Association, 2016; Kumar et al., 2018; Philpott, 2023). On the relationship level, PPPD affects family dynamics, spousal relationships, and the parental relationship with their children (Canadian Mental Health Association, 2016; Kumar et al., 2018; Philpott, 2023). These effects may extend to the psychological and psychosocial behavior of the child or children, potentially resulting in consequences for children's academic performance (Fisher, 2017; O'Brien et al., 2017; Philpott, 2023; Sweeney & MacBeth, 2016). On the community level, the influence of PPPD can be manifested in fathers' work performance and a family's economic growth (Philpott, 2023; World Health Organization, 2017). On the societal level, the impact of PPPD can be witnessed as elevated healthcare costs and lowered economic growth of a country (Philpott, 2023; Takehara et al., 2020; World Health Organization, 2017). In the long run, PPPD can have negative affects across all socioecological levels (i.e., individual, relationship, community, and society) by influencing the quality of life of a father, his family, community, and society, in which he lives.

Research Gap

Prevalence of PPPD has been recorded in 26 countries across four regions (Americas, Asia, Europe, and Oceania) (*UNSD — Methodology*, n.d.) by measuring the symptoms of anxiety and depression separately, or by encompassing the symptoms of anxiety and depression both (Cameron et al., 2016; Gawlik et al., 2014; Koh et al., 2014; Lara et al., 2021; Leach et al., 2016; Mangialavori et al., 2020). Methodological and assessment challenges in these studies resulted in varied prevalence rates of PPPD such as unavailability of diagnostic criteria for PPPD and

official unrecognition of PPPD as a psychiatric illness in the fifth and text-revision edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR) (American Psychiatric Association, 2013; Azzam et al., 2022; Bruno et al., 2020; Chavis, 2022). Despite these methodological and assessment challenges, fathers reported experiencing higher levels of depression and anxiety during their wife's perinatal period.

To date, none of the studies about PPPD in first-time fathers have been conducted in Pakistan. Only an abstract of a singular study (published in two articles) was located investigating the experiences of first-time fathers in Pakistan (Pirani & Karmaliani, 2015b, 2015a). However, the study solely concentrated on the postnatal period and additional details about the study are not available. Hence, there is a gap in the literature about PPPD in first-time Pakistani fathers, and about experiences of men becoming first-time fathers in Pakistan during the perinatal period and the causal mechanism(s) underlying those experiences. Therefore, this thesis is aimed to fill that research gap by exploring the experiences of first-time fathers in Pakistan during the perinatal period of their wives, and by hypothesizing the causal mechanism(s) underneath those experiences in the context of Pakistan.

Philosophical and Theoretical Frameworks

This thesis was guided by the philosophy of Critical Realism (CR) and the Socio-Ecological Model (SEM) framework. The philosophy of CR was used for conducting and analyzing the findings of the qualitative phase of this thesis, and the SEM framework was used as an organizing framework for interpreting the results of the scoping review and qualitative research components of this multi-method study.

Philosophy of Critical Realism (CR)

In the 1970s, Roy Bhaskar formulated the philosophy of CR which was advanced and expanded by himself and other scholars in subsequent years (Koopmans & Schiller, 2022). The CR approach is more appropriate for constructing a contextual instrument (Bhaskar, 1975). The principles of CR were applied to various fields such as social sciences, health sciences, psychology, education, midwifery, and nursing (Brunson et al., n.d.; Koopmans & Schiller, 2022; Schiller, 2016). CR is a valuable philosophical approach for the studies that aims to acquire a profound comprehension of the underlying structures and mechanisms that shape the experiences of individuals (Koopmans & Schiller, 2022).

Socio-Ecological Model (SEM) Framework

The SEM framework was formulated in 2007 by the Centers for Disease Control and Prevention (CDC) to steer its disease prevention and health promotion programs (Agency for Toxic Substances and Disease Registry - ATSDR, 2022). The framework clusters socio-ecological factors that affect human health and behaviors into 4 layers: individual, relationship, community, and societal (Agency for Toxic Substances and Disease Registry - ATSDR, 2022; *Principles of Community Engagement - Second Edition*, 2015).

Research Objectives

The initial purpose of the proposed research program was to develop a gender-specific tool for screening perinatal psychological distress among first-time fathers in Pakistan. For feasibility reasons, the initial two phases of the research program were conducted for this doctoral thesis by using multi-method research design. The research objectives of the thesis are:

1. To identify available evidence related to contributing factors for developing PPPD and SEM layer(s) in the development of PPPD among first-time fathers.
2. To identify and seek explanations about the causal mechanism(s) behind the experience(s) of men becoming first-time fathers in Pakistan, under the philosophy of Critical Realism (CR); by exploring the role and relationship of structure and agency in generating those mechanism(s).

Thesis Structure

A Thesis-By-Articles approach was applied for addressing the abovementioned research objectives. To begin, a scoping review was conducted for recognizing the gaps related to the contributing factors for the development of PPPD in first-time fathers. The identified gaps informed the second phase of the study in which the experiences of the first-time Pakistani fathers were explored and investigated for seeking explanations about their experiences under the philosophy of the CR. The SEM framework was used as an organizing framework for synthesis in the scoping review and data analysis in the qualitative study. The structure of this thesis is presented in Table 1. Additional chapters are included in the thesis to link the major sections (chapters) of the thesis to make explicit how each major section contributes to the whole thesis.

Table 1

Thesis-By-Articles Structure for Multi-Method Research

Chapter Number	Chapter Title	Objectives	Study Design	Publication Status

1	Introduction	To describe the background, research problem, research gap, applied frameworks, research objectives, and structure of the thesis.		Not Applicable
2	First-Time Father's Risk Factors of Paternal Perinatal Psychological Distress: A Scoping Review	To identify available evidence related to contributing factors and its SEM layer(s) in the development of PPPD among first-time fathers.	Scoping Review	Manuscript submitted to the Discover Psychology journal on January 10, 2024.
3	A Critical Realism and Socio-Ecological Integrated Model for Research with New Fathers in Pakistan: A	To describe the methodological approach used to integrate the philosophy of Critical Realism (CR) and the Socio-Ecological Model (SEM) to conduct a qualitative, nursing research study on the perinatal experiences of men becoming first-time fathers in Pakistan.	Method Paper	Manuscript prepared for submission to International Journal of Qualitative Methods.

	Methodological Paper			
4	Qualitative Study of Men's Experiences of Becoming a Father for the First-time in Pakistan: A Critical Realist Perspective	To identify and seek explanations about the causal mechanism(s) behind the experience(s) of men becoming first-time fathers in Pakistan, under the philosophy of Critical Realism (CR); by exploring the role and relationship of structure and agency in generating those mechanism(s).	Qualitative Research – Database Paper	Manuscript prepared for submission to the Discover Psychology journal.
5	Integrated Discussion	To integrate the results of the thesis and to identify the implications of thesis for nursing research, education, policy, and practice.		Not Applicable

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Transition to Manuscript One (Scoping Review)

The first manuscript presents a scoping review conducted about first-time fathers' risk factors for developing paternal perinatal psychological distress (PPPD) during their wives' perinatal period. This scoping review was guided by the Arksey and O'Malley's framework. The protocol of this scoping review was registered at the Open Science Framework (OSF) (https://doi.org/10.17605/OSF.IO/94EKY).

The review question was described by using the Population, Concept, and Context (PCC) framework, recommended by the Joanna Briggs Institute (JBI). The relevant literature was retrieved with the help of the five databases (CINAHL, EMBASE, MEDLINE, PsycINFO, and PubMed). Eligibility criteria and search strategy were developed for retrieval of the relevant literature. Full-text, English literature was retrieved from January 01, 2020, to January 04, 2023.

The data was extracted from a total of 16 articles using an investigator developed data extraction tool. The data was analyzed by using the Socio-Ecological Model (SEM) framework, developed by the Centers for Disease Control and Prevention (CDC). The interrater reliability of this scoping review was 56%. A total of 56 tools were identified that have been used for assessing the risk factors contributing to PPPD in first-time fathers. The recognized risk factors were grouped into 12 domains (psychological, substance abuse, personality, relationship, physical, social, gender role, quality of life, financial, inter-role, family, and self-esteem).

The results indicated the absence of gender-sensitive tools for measuring risk factors for developing the PPPD in first-time fathers. Only one Pakistani father participated in the included studies. The identified risk factor domains (n = 12) for developing PPPD in first-time fathers

corresponded to at least one of the four SEM framework levels (individual, relationship, community, and societal).

Chapter Two

First-Time Father's Risk Factors of Paternal Perinatal Psychological Distress: A Scoping Review

Sadaf Zindani, RN, PhD Candidate[1]

Julie Chartrand, RN, PhD[2]

Jean Hannan, RN, APRN, PhD, FAAN[3]

J. Craig Phillips, LLM, PhD, RN, ACRN, FAAN, FCAN[4]

[1]School of Nursing, University of Ottawa, Ontario, Canada

[2]Associate Professor, School of Nursing, University of Ottawa, Ontario, Canada

[3]Associate Professor, Nicole Wertheim College of Nursing & Health Sciences, Florida International University, Miami, USA

[4]Professor, School of Nursing, University of Ottawa, Ontario, Canada

Sadaf Zindani (SZ) https://orcid.org/0000-0001-8069-5487

Corresponding Author: Sadaf Zindani

Julie Chartrand (JC) https://orcid.org/0000-0001-9075-054X

Jean Hannan (JH) https://orcid.org/0000-0003-3740-620X

J. Craig Phillips (JCP) https://orcid.org/0000-0002-6697-0515

Abstract

Keywords: Scoping Review, Risk Factors, Perinatal, Psychological Distress, First-time Fathers

Background: Fathers can experience psychological distress during paternal perinatal period. The effects of paternal perinatal psychological distress (PPPD) are multi-layered. However, little research is available about PPPD in first-time fathers. The purpose of this review is to explore the literature about risk factors contributing to PPPD in first-time fathers.

Methods: The Arksey & O'Malley framework was used to guide this scoping review. The protocol was registered at the Open Science Framework (OSF) (https://doi.org/10.17605/OSF.IO/94EKY). Population, Concept, and Context (PCC) framework was used for answering the review question "What evidence is available about factors contributing to PPPD in first-time fathers?" Five databases (CINAHL, EMBASE, MEDLINE, PsycINFO, and PubMed) were used to retrieve relevant, full-text, English references from January 01, 2020, to January 04, 2023. A data extraction tool was developed to identify risk factors assessed in the included studies. The Socio-Ecological Model (SEM) was used for analyzing the extracted data according to the four socioecological levels i.e., individual, relationship, community, and societal.

Results: A total of 18 references reporting on 16 studies were included in the review. Most studies included in the review used quantitative research methods. A few studies used qualitative or mixed-method approaches. Fifty-six tools were used for assessing the risk factors contributing to PPPD in first-time fathers. However, limited understanding was established about the risk factors as the tools lacked gender sensitivity. The identified risk factors belonged to 12 domains

(e.g., psychological, relationship, social, physical). Most domains corresponded with the individual level of SEM. Only two domains corresponded with the societal level of SEM.

Conclusions: The literature indicates there are few studies about PPPD experienced by first-time fathers. The studies indicate fathers experience psychological distress during the perinatal period, however because of cultural limitations, they are not able to express or seek help. This scoping review adds to the literate of the mental healthcare gaps for this population. Further research on measuring PPPD may improve individual and family functioning during the perinatal period.

Declarations

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Competing Interests

The authors declare that they have no competing interests.

Data Availability

The datasets supporting the conclusions of this article are included within the article and its additional files. The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Codes Availability

Not Applicable

Authors' Contributions

SZ and JCP examined the full texts of selected literature, in detail. SZ interpreted the selected studies and made a major contribution in writing the manuscript. All authors edited, reviewed, read, and approved the final manuscript.

Introduction

Major life transitions, including changes that occur in the perinatal period for fathers, can induce psychological distress [1-3]; especially if they are experiencing the paternal perinatal period for the first time. Maternal mental health during the perinatal period has received considerable attention globally from existing healthcare systems, researchers, and policy makers [4-5]. However, there is little data on paternal perinatal mental health [5-6]. Studies conducted internationally have provided evidence that fathers experience psychological distress during their wife's perinatal period [1, 4, 7]. It is unknown whether fathers are experiencing perinatal distress in Pakistan, because this phenomenon has neither been investigated nor documented in the literature to date. In this scoping review, we will explore literature, globally, related to risk factors contributing to paternal perinatal psychological distress (PPPD) among first-time fathers.

Effects of Paternal Perinatal Psychological Distress (PPPD)

A person's health is affected by the multilayered interactions and relationships between themselves, community, and society [8]. Scholars have described these levels of interactions and relationships as occurring within and across the intrapersonal, interpersonal, community, and society levels [9]. Paternal perinatal psychological distress (PPPD), the psychological distress that some fathers may experience during the paternal perinatal period, is an important area of study because of its widespread effects within and across each of these four social ecological levels (i.e., intrapersonal, interpersonal, community, and society).

The effects of PPPD on intrapersonal and interpersonal levels, may manifest in the mental health of a father, his family, and on his relationships with his spouse and children [3, 7, 10], including his child's psychological and psychosocial behavior, and academic performance

[7, 11-13]. At the community level, effects of PPPD can be witnessed on fathers' work performance [14], and on the economic growth of the family [7, 15]. At the societal level, the burden of PPPD may be observed at national levels through increased healthcare costs [7, 16], and potentially result in decreased economic growth of a country [15]. Ultimately, PPPD can negatively influence all socioecological levels and the quality of life of a father (interpersonal level), his family (interpersonal level), community (community level), and society (societal level) in which he lives.

It is important to note that despite researchers exploring the negative effects that perinatal psychological distress can have on couples, children, families, communities, and nations; PPPD has not been explored at global or national levels [16].

Prevalence of Paternal Perinatal Psychological Distress (PPPD)

The prevalence of PPPD has been reported in Australia, Brazil, Canada, China, Denmark, Finland, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Sweden, Taiwan, Turkey, United Kingdom (UK), United States of America (USA), and Vietnam [17-22]. However, it is reported separately as symptoms of anxiety, or depression [17-19]. Some studies reported a combination of vague symptoms including, anxiety and depression [20, 22].

Symptoms of Anxiety

In a systematic review of paternal perinatal anxiety disorders, 43 studies identified from five databases; PubMed, PsycINFO, Cochrane, SCOPUS, and Web of Science, were reviewed [21]. The included studies (n = 43) were conducted in Australia, Brazil, Finland, Germany,

Greece, Israel, Netherlands, New Zealand, Norway, Portugal, Sweden, Taiwan, United Kingdom (UK), United States of America (USA), and Vietnam. The sample size of the included studies (n = 43) ranged from 37 to 739 fathers. Prevalence of paternal perinatal anxiety disorders across the reviewed studies ranged from 4.1% to 16.0% during the antepartum period and 2.4% to 18.0% during the postpartum period.

Symptoms of Depression

Symptoms of depression have been documented in multiple countries [18, 19]. This research includes survey-based observational studies conducted in Germany and Hong Kong [18, 19]. A longitudinal survey conducted in Germany documented the prevalence of paternal perinatal depression among a sample of 102 expectant fathers [18]. Perinatal depression was experienced by 9.8% (n = 10) of the fathers and 7.8% (n = 8) of fathers experienced postnatal depression. In addition to documenting rates of depression, it also explored the connection between depression and birth-related and future concerns. A survey was conducted on the prevalence and risk factors of paternal perinatal depression and the association between antepartum and postpartum depression among expectant fathers in Hong Kong [19]. A total of 622 expectant fathers were recruited and only 187 (30.1%) of them completed the survey at all three study timepoints. The study revealed that a statistically significant number of expectant fathers experienced depression during the perinatal period [$F(2, 156) = 51.56$, $p < .000$], and the fathers who experienced paternal antenatal depression were more likely (i.e., 39%) to experience postnatal depression also. An updated meta-analysis was conducted regarding the prevalence of perinatal depression among fathers [17]. The meta-analysis included 74 studies (n = 41,480 participants), which were identified from four electronic databases, namely CINAHL with Full Text, PsycINFO, Medline, and Health Source: nursing/academic edition. The studies included

were conducted in 23 countries (i.e., Australia, Brazil, Canada, China, Denmark, Finland, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Sweden, Taiwan, Turkey, UK, USA, and Vietnam); from five continents. The study determined that the meta-prevalence of perinatal depression in fathers was 8.4% (95% confidence interval [CI], 7.2-9.6%) (Cameron et al., 2016).

Combination of Symptoms

A cross-sectional study for early signs of paternal perinatal affective disorder in expectant fathers (*n* = 350, 82.74%) was conducted in Italy [22]. The study determined that 14.9% (*n* = 52) of Italian expectant fathers experienced perinatal psychological distress. A recent cross-sectional study was conducted in Mexico to describe the prevalence of perinatal psychological distress in 997 fathers [20]. The results of this study determined a moderate level of perinatal psychological distress in fathers during the prenatal period (*n* = 128, 25%) and during the postnatal period (*n* = 142, 29.5%). Serious levels of perinatal psychological distress were reported among fathers during the antenatal period (*n* = 5, 1%) and during the postnatal period (*n* = 9, 1.9%).

Summary

The existing literature indicates varied prevalence rates of paternal perinatal psychological distress (PPPD) among fathers. The reasons for having variations in prevalence rates of PPPD may be due to methodological and assessment issues [4, 23]. For example, criteria for diagnosing PPPD is non-existent in the fifth and text-revision edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR) [4, 23-25]. Likewise, PPPD has not been officially acknowledged as a psychiatric ailment in the DSM-5-TR [4, 23-25].

In summary, fathers reported experiences of depression and anxiety that are higher during the perinatal period [26]. When fathers experience these symptoms of psychological distress the profound impacts on mothers' and children's wellbeing and health are magnified [27]. Unfortunately, there is diminished visibility of these issues in the research literature [26-27].

Current literature has documented symptoms separately but there does not appear to be an evidence base of the factors that contribute to the development of PPPD among first-time fathers and the socioecological levels from where they originate, including at the intrapersonal, interpersonal, community, and society levels. The exploration of the risk factors for developing PPPD among first-time fathers across the socioecological levels may support researchers, healthcare professionals and policymakers to develop and implement interventions to reduce perinatal psychological distress among first-time fathers and in turn improve health outcomes for all family members. In this regard, the use of the Socio-Ecological Framework (SEM) can assist researchers to identify the potential source of risk factors that contribute to the development of PPPD among first-time fathers.

Socio-Ecological Framework (SEM)

Urie Bronfenbrenner presented the socio-ecological model (SEM) framework in the 1970s, which was developed into Ecological Systems Theory in the 1980s [8, 28]. This model / theory is based on the interactions of an individual occurring with or between five ecological systems (i.e.; microsystem, mesosystem, exosystem, macrosystem, and chronosystem), and effects on human development [8]. In 1994, Bronfenbrenner revised the Ecological Systems Theory and renamed it the Bioecological Model [29].

The model / theory developed by Bronfenbrenner has several limitations [29]. Research analyzing the mesosystems is inadequate in nature, hence the scope of effects of mesosystems on human development is ill-defined [29]. The empirical testing of this theory is difficult because the direction by which the effects were produced by these ecological systems cannot be determined [29]. This theory assumes that human development cannot be completed in absence of the effective ecological systems [29]. This assumption can be validated for some individuals, but not for all humans [29].

In 2007, based on socioecology theory, the Centers for Disease Control and Prevention (CDC) developed a Socio-Ecological Model (SEM) Framework for guiding its disease prevention and health promotion programs [9]. This CDC framework includes four levels of factors, individual, relationship, community, and societal, that affect a person's health [9].

Level-1: Individual (Intrapersonal)

The first level consists of biological factors and further personal characteristics affecting the health of an individual such as age, education, income, health history, etc. [9, 30].

Level-2: Relationship (Interpersonal)

The second level assesses the effects of close relationships on an individual's health like grandparents, parents, siblings, family members, peers, coworkers, etc. [9, 30].

Level-3: Community

The third level investigates the effects of setting, in which social relationships take place for example; school, neighborhood, workplace, healthcare facilities, worship place, etc. [9, 30].

Level-4: Society

The fourth level explores the effects produced by the wide-ranging societal factors on an individual's health. Factors at this level include policies, laws, norms, values, and culture [9, 30].

Research Purpose and Significance

Previous studies have documented that fathers experience psychological distress during the perinatal period of their wives. While searching databases for review studies, no review was found that was conducted identifying the risk factors of PPPD among first-time fathers. Therefore, the purpose of this scoping review is to identify available evidence related to the risk factors contributing to the development of PPPD among first-time fathers. The results from this scoping review will inform researchers to conduct further studies into the potentially existing gaps identified in the field of PPPD.

Methods

The original steps of the Arksey & O'Malley (2005) framework guided this scoping review to: (Step 1) identify the research question; (Step 2) identify relevant studies; (Step 3) study selection; (Step 4) charting the data; and (Step 5) collating, summarizing, and reporting the results. A description of these steps is provided below. The results of this review, and discussion of the results are reported here under the fifth step of Arksey & O'Malley's framework.

Step 1: Identify Research Question

After having thoughtful and deliberate discussions among the research team members, the question that emerged from the purpose of this review was: What evidence is available about

factors contributing to paternal perinatal psychological distress among first-time fathers? The population, concept & context (PCC) framework recommended by the Joanna Briggs Institute (JBI) was used to define this review question [31]; the population is first-time fathers, the concept is risk factors for developing psychological distress, and the context is the paternal perinatal period, which extends from antepartum through intrapartum to postpartum.

Step 2: Identify Relevant Studies

The eligibility criteria used in the search for relevant studies were derived from the PCC framework (See Supplementary Table 1, Additional File 1) [31]. In general, studies were included if they were conducted on first-time biological fathers, having opposite sex relationships, published full-text articles in English language from January 01, 2020, to January 04, 2023. However, due to the large number of studies found in the initial pilot search, the eligibility criteria were revised and four criteria that had been included earlier; were excluded for this scoping review; these were: (i) any outcome of pregnancy, (ii) any outcome of delivery, (iii) any result of anomaly scan, and (iv) intervention studies.

An initial search was conducted in the CINAHL (i.e., Cumulative Index to Nursing and Allied Health Literature) and PsycINFO databases to identify the relevant terms separately (e.g.; first-time fathers, new fathers, new expectant fathers, first-time expectant men, new expectant men, paternal; anxiety, worry, fear, apprehension, concern, nervousness, depression, sad, sadness, depressed, blue, grief, unhappy, hopeless, misery, sorrow, stress, psychological distress, psychosocial factors, psychosocial impacts, psychosocial effects, risk factors, contributing factors, influencing factors, predisposing factors, predictors, cause) to use in title, abstract, and

index terms, which helped in developing a comprehensive search strategy (See Supplementary Table 2, Additional File 2).

After validation of the search strategy on CINAHL, it was translated and replicated for other databases. The electronic databases used for subsequent searching for published articles using MeSH (i.e., Medical Subject Headings) terms and Boolean operators included: CINAHL, EMBASE (i.e., Excerpta Medica database), MEDLINE, PsycINFO, and PubMed. Refined search terms were used for conducting this subsequent search. Lastly, reference lists of all the included studies were screened to find additional relevant studies. In this regard, a search strategy for the terms was developed in consultation with a health sciences librarian (See Table 1).

Step 3: Study Selection

References of all identified studies were collected & uploaded into the reference manager software Zotero, version 5.0.90. A two-stage screening process was used for selecting relevant studies. During the first stage, the research team screened the title and abstract of all identified literature, to verify literature relevance to the set eligibility criteria for the scoping review. Potentially relevant full texts were retrieved. Two independent reviewers (SZ, JCP) examined the full texts of selected literature, in detail, during the second stage. A third reviewer was not consulted because the first two reviewers achieved consensus about including studies through discussion among themselves.

The study selection process is presented in a flow diagram (See Figure 1) [32]. As depicted in Figure 1, a total of 10,513 studies were selected from the five databases (i.e., CINAHL, EMBASE, PsycINFO, MEDLINE, and PubMed), and reference lists of the studies. After removing duplicates, title, and abstract screening of 10,382 studies was conducted. Full-

text review was conducted for 115 studies. Out of these 115 studies, 97 studies did not meet inclusion criteria and were excluded from the scoping review. Finally, 18 articles were included in the review representing 16 distinct studies. Two studies were reported in 2 articles each from different perspectives with different research questions [33-36].

Step 4: Charting Data

A data extraction tool was developed by the researchers through in-depth discussions. There were no disagreements in developing and charting the Data Extraction Tool among team members. The data extraction tool is available on request.

Step 5: Collating, Summarizing & Reporting Results

Initially it was planned to analyze the data by using the Qualitative Content Analysis (QCA) technique. But during the data analysis process, it was observed that the data began to cluster around categories or themes that aligned with the Socioecological Model Framework (SEM) [9]. Because of the similarities of patterns observed between the data and the SEM. the SEM framework was used for categorizing the data for further analysis. Additionally, the SEM afforded a means to organize discussion of the data and situating it within the context of the scoping review. Cohen's Kappa Statistics showed acceptable interrater reliability of 56%.

Results

The included studies (n = 16) were conducted in seven different countries. Most studies were conducted in Australia (n = 4, 25%) [33-34, 37-38, 50]; the remaining studies were conducted in China (n = 3, 18.75%) [39-41], United States of America (n = 3, 18.75%) [42-44], Sweden (n = 2, 12.5%) [45-46], United Kingdom (n = 2, 12.5%) [47-48], Canada (n = 1, 6.25%)

[35-36], and Taiwan (*n* = 1, 6.25%) [49]. These studies reported risk factors that may have contributed to PPPD among first-time fathers (see Table 2). Most studies used quantitative research methods [33-46, 48-49]. A few studies used qualitative [47], or mixed-method [50] approaches (See Table 2).

This scoping review included a combined sample of 3,887 men from around the world. Most were from Sweden (*n* = 1217, 31.31%) followed by Australia (*n* = 870, 22.38%), China (*n* = 736, 18.93%), Canada (*n* = 622, 16.0%), United States of America (*n* = 272, 7.0%), United Kingdom (*n* = 87, 2.24%), and Taiwan (*n* = 83, 2.14%) (See Table 2). Table 2 includes a summary of the socio-demographic characteristics of the men who participated in the included studies. Most participants ranged in age from 26 to 39 years old and their education status varied between lower middle level (i.e., below seventh grade) to postgraduate level (i.e., above 18 years of education).

From the studies included in this scoping review, 56 instruments were used to measure aspects of psychological distress or psychopathology, according to 12 domains of risk factors that contribute to PPPD among first-time fathers (See Table 3). Conceptual categories of the instruments reviewed were developed from content analysis completed by our team. Most instruments measured aspects of the psychological domain (*n* = 19, 33.93%), followed by domains related to relationship (*n* = 10, 17.86%), social (*n* = 7, 12.5%), physical (*n* = 5, 8.93%), family (*n* = 4, 7.12%), personality (*n* = 3, 5.36%), substance abuse (*n* = 2, 3.57%), quality of life (*n* = 2, 3.57%), gender role (*n* = 1, 1.79%), financial (*n* = 1, 1.79%), inter-role (*n* = 1, 1.79%), and self-esteem (*n* = 1, 1.79%) (see Table 3). Of these 56 instruments, almost one-third of the instruments (*n* = 19, 33.93%) did not define all the constructs used in the instruments or the

articles describing the instrument could not be retrieved (*n* = 6) (See Supplementary Table 3, Additional File 3).

Across the studies reviewed, the psychological domain (*n* = 14, 87.5%) was the most frequently explored domain of risk factors that contribute to PPPD among first-time fathers. Additional domains explored based on frequency and percent were the domains related to relationship (*n* = 8, 50%), social (*n* = 7, 43.75%), physical (*n* = 3, 18.75%), gender role (*n* = 2, 12.5%), quality of life (*n* = 2, 12.5%), family (*n* = 2, 12.5 %), substance abuse (*n* = 1, 6.25%), personality (*n* = 1, 6.25%), financial (*n* = 1, 6.25%), inter-role (*n* = 1, 6.25%), and self-esteem (*n* = 1, 6.25%) (See Table 4).

Discussion

This scoping review aimed to explore the existing literature globally related to risk factors contributing to development of paternal perinatal psychological distress (PPPD) among first-time fathers, with an intent to identify ways to support new fathers in Pakistan during this period of their life transition. Sixteen studies were reviewed using the Arksey and O'Malley (2005) framework.

Results Interpretation

The findings of this scoping review revealed that only one Pakistani father participated in one of the reviewed studies conducted by Baldwin and colleagues (2019) (See Table 2). Out of fifty-six tools used in these sixteen studies, only one tool (i.e., Edinburgh Postnatal Depression Scale – EPDS) was specifically developed for detecting postnatal depression, primarily for mothers (See Table 3).

Measuring Tools

Currently, the tools used to measure perinatal psychological distress among fathers in terms of depression, anxiety, or stress; have been developed for screening women in the perinatal period or for assessing general people independent of the perinatal period [7, 51]. Prevailing tools for measuring PPPD have their own limitations in making accurate diagnosis of psychological distress in fathers during the perinatal period [7]. For instance, experiencing inadequate sleep and fatigue are normal during the perinatal period but included as diagnostic criteria in the tools developed for assessing anxiety or depression in general populations [7]. Similarly, these tools have included the depressive symptoms, i.e., sadness and crying, which are mostly expressed by the women and men who express these emotions are often stigmatized as weak [7, 52].

Due to unavailability of a contextual (i.e., gender-specific) tool for assessing PPD in fathers, risk factors for PPPD are inadequately understood [23, 25]. Consequently, it resulted in lack of criteria for diagnosing PPPD, and official recognition of PPPD in the DSM-5-TR [4, 23-25]. Therefore, the development of a gender-specific tool for assessing PPPD is highly recommended with the intent to assist policymakers and healthcare practitioners for including PPPD in the upcoming version of the Diagnostic and Statistical Manual of Mental Disorders (DSM). However, it is noteworthy to remain mindful that the purpose of including PPPD in DSM is not to medicalize it, rather to identify and modify the risk factors contributing to it, to administer nonpharmacological interventions to fathers, and to provide support to fathers and their families during perinatal period through prevention and health promotion initiatives.

SEM Levels

After reviewing the extracted data from the included studies (n = 16) it was observed that the domains (n = 12) of the risk factors contributing to PPPD among first-time fathers aligned with the 4 levels of the Socio-Ecological Model (SEM) reported on the CDC's (i.e., Centers for Disease Control and Prevention) website (See Supplementary Table 4, Additional File 4). These levels include individual, relationship, community, and societal [53]. Out of these 12 domains; most of them (n = 11, 91.67%) corresponded with the first level of the SEM framework i.e., 'Individual', 8 domains (i.e., 66.67%) aligned with the SEM levels of 'Relationship' and 'Community', and only 2 domains (i.e., 16.67%) were associated with the 'Societal' level (See Supplementary Table 5, Additional File 5).

Similarly, most of the instruments (n = 39, 72.22%) studied the risk factors related to 'Individual' level of SEM framework, followed by the instruments (n = 25, 46.30%) studying the risk factors associated with 'Relationship', 'Community' (n = 15, 27.78), and 'Societal' levels (n = 2, 3.7%) (See Supplementary Table 6, Additional File 6).

Individual. This level of the SEM includes sub-factors of biological sex, age, income, education, and history of substance abuse [53-54]. According to this criterion, all domains fall under the level of Individual, except the domain of Inter-Role. However, individuals performing any role cannot be kept in silos, without their personality and sociodemographic characteristics having an effect on their roles and health [55].

Relationship. This level studies the role of relationships affecting the health of an individual [53-54]. The included studies in this review did not address the effects of relationships on substance abuse, individual's personality, physical, and financial situation. A person is

surrounded by people, tied in different relationships with them, and hence cannot function properly being alone or in isolation. The relationships whether romantic, friendly, spiritual and / or professional, has a central role in sustaining individuals' mental and physical health and well-being [56].

Community. According to this level of SEM neighborhood environment and social institutions such as living, studying, working, and worship conditions and settings are equally important for impacting an individual's health [53-54, 57]. But the studies included in the review did not consider the impact of these settings as a risk factor for developing perinatal psychological distress among first-time fathers. This may represent an additional area for potential intervention to prevent psychological distress and promote family functioning and men's mental health during the perinatal period.

Societal. The extensive effects of risk factors (e.g., policies, norms, culture, etc.) related to the Societal level of SEM framework were overlooked in most of the domains (n = 10, 83.33%) of the included studies, except the domains of 'Relationship' and 'Family'. The factors of society like policies, norms, and culture, have been the harsh realities of our world for ages and have deep roots in affecting an individual's health and mental well-being [53-54, 58]. The lack of research into the effects of the other domains at the societal level represent an additional opportunity for future research to improve family functioning and men's mental health during the perinatal period.

Study Implications

This scoping review has implications for researchers to further study the identified gaps in the field of PPPD. For example, most of the studies included are quantitative and have not

explored the origins of the risk factors leading first-time fathers towards paternal perinatal psychological distress (PPPD). Hence, researchers can explore further risk factors and their origins by using mixed-method, multi-method, and qualitative study approaches. Similarly, the results of the reviewed studies indicate a need for tool development particularly for assessing perinatal psychological distress among men. This will support practitioners in making reliable diagnosis of PPPD in fathers and provide opportunities to intervene to promote men's mental health.

Our scoping review findings may also help policymakers to frame relevant policies for investigating and managing PPPD, on national and global levels. Also, they may help policymakers and educators to include the topic of PPPD in the existing medical and nursing curriculum. Eventually, all these collective efforts will bring improvement in the mental health of fathers during perinatal period, especially for those experiencing fatherhood for the first-time.

Limitations and Strengths

Only primary research articles published in English were reviewed, which might have resulted in missing relevant articles in other languages and grey literature. To the best of the researchers' knowledge, this is the first scoping review conducted about risk factors contributing to the development of PPPD in first-time fathers. Also, this is the first time that origins of those risk factors have been identified using the SEM framework.

Conclusion

The articles found in this scoping review of international literature indicate that there is a need to monitor the psychological distress in fathers, especially first-time fathers during the

perinatal period. We used the SEM framework to document potential factors that are signs indicating a need for concern among clinicians working with new fathers during this life transition. We also identified that currently the numerous instruments designed to measure aspects of psychological distress may be insufficient to meet the needs of fathers experiencing psychological distress during the perinatal period. There is a need to develop instruments that capture the essence of the experiences of fathers during this major life transition, especially for first-time fathers. There is also a need to develop interventions to support fathers who experience psychological distress during the perinatal period. Our use of the SEM framework offers additional clues about the levels at which interventions can be developed to address this issue. Our findings help build a foundation for further research that may alleviate the psychological distress experienced by fathers and ultimately inform interventions that will improve the health and wellbeing of these men and their families.

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Transition to Manuscript Two (Method Paper)

The second manuscript illustrated the process for integrating the SEM framework into the philosophy of Critical Realism (CR). This integrated model was developed for analyzing the results of the qualitative phase of the thesis. This integration was done in three stages (integration stage, exploration stage, and validation stage). These three stages were further divided into six steps (integration of situation, exploration of experiences, exploration of events, hypothesize causal mechanism, summative validation, and triangulation).

Stage-I (Integration Stage): In the first step (integration of situation), the results of the scoping review conducted in phase one of this thesis were included and government policies for supporting first-time fathers during perinatal period in Pakistan were searched for. The results of the scoping review and policy search was integrated to gain a more complete and better understanding of the research problem in the context of Pakistan.

Stage-II (Exploration Stage): In the second step (exploration of experiences), the experiences of men becoming first-time fathers in Pakistan were included in the form of the detailed narrative summaries. These experiences were explored in the second phase of this thesis by using the qualitative descriptive research approach. In the third step (exploration of events), the events were identified which became the basis of the experiences that first-time fathers had in Pakistan during the perinatal period of their wives. In the fourth step (hypothesize causal mechanism), numerous explanations were proposed by the researcher for understanding the multilayered interactions occurring between agents and social structures which shaped up the events as experienced by the first-time fathers in Pakistan. It is during this step where the SEM

framework was integrated with the CR philosophy for gaining better and deeper understanding of the prevalent causal mechanism(s) in the context of Pakistan.

Stage-III (Validation Stage): In the fifth step (summative validation), causal mechanism(s) for one participant was compared with the other participants, and their narrative summaries were shared with them for validation. Triangulation was achieved in the sixth step (triangulation) by having a multi-method research design, validated narrative summaries, and integration of SEM framework into CR philosophy.

Chapter Three

A Critical Realism and Socio-Ecological Integrated Model for Research with New Fathers in Pakistan: A Methodological Paper

Sadaf Zindani, PhD Candidate, RN[1]

Julie Chartrand, Associate Professor, RN, PhD[2]

Jean Hannan, Associate Professor, RN, APRN, PhD, FAAN[3]

J. Craig Phillips, Professor, LLM, PhD, RN, ACRN, FAAN, FCAN[4]

[1,2,4]School of Nursing, University of Ottawa, Ontario, Canada

Nicole Wertheim College of Nursing & Health Sciences, Florida International University, Miami, USA

Author Note

Sadaf Zindani (SZ) https://orcid.org/0000-0001-8069-5487

Julie Chartrand (JC) https://orcid.org/0000-0001-9075-054X

Jean Hannan (JH) https://orcid.org/0000-0003-3740-620X

J. Craig Phillips (JCP) https://orcid.org/0000-0002-6697-0515

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Abstract

Keywords: Critical Realism, Socio-Ecological Model, Pakistan, Integrated Framework, New Fatthers, Method

Background: The philosophy of Critical Realism (CR) has not been integrated with the Socio-Ecological Model (SEM) framework before. The intent to write this paper is to disseminate knowledge about the method for integrating SEM into CR.

Methods: The SEM consists of four layers (individual, relationship, community, and societal). The CR philosophy is based on the assumptions of independent reality, stratified reality, open system, multiple explanations, mediated knowledge, explanations, and unobservability of mechanism(s). The complex and contextual interaction between agents and social structures lays the foundation for generating causal mechanism(s) for the observable experiences and events. The process of integrating SEM into CR was carried out in three stages: (1) integration stage, (2) exploration stage, and (3) validation stage.

Results: A framework / model for integrating SEM into CR was developed using six steps under three stages. These steps included: (i) integration of situation, (ii) exploration of experiences, (iii) exploration of events, (iv) hypothesize causal mechanism, (v) summative validation, and (vi) triangulation.

Conclusions: Conducting and interpreting research under this integrated model is time-consuming but it is worthy for gaining profound and contextual understanding of the understudied phenomenon and the reasons behind those causal mechanism(s) that generate it in any specific society. This integration can also be fruitful for developing contextual measures to overcome healthcare challenges in any given society.

A Critical Realism and Socio-Ecological Integrated Model for Research with New Fathers in Pakistan: A Methodological Paper

Introduction

The purpose of this paper is to describe the methodological approach we used to integrate the philosophy of Critical Realism (CR) and the Socio-Ecological Model (SEM) to conduct a qualitative descriptive nursing research on the perinatal experiences of men becoming first-time fathers in Pakistan. The Pakistani society is very powerful as compared to the state or government (Lieven, 2011). To our knowledge, this is the first time CR and SEM have been integrated and this is a novel approach to exploring the perspectives of these men, especially in the context of Pakistan. In subsequent sections we describe the Pakistani society, tenets of CR and SEM, and the process we used to integrate them in our study.

Background

Pakistan is categorized as a low-and-middle-income country (LMIC) (The World Bank, n.d.). Pakistan is a Muslim majority country in the Southern Asia region which gained independence from the United Kingdom in 1947 (Pakistan Bureau of Statistics, 2017; Shafiq, 2020). Pakistan consists of many subcultures due to its diversified population in terms of ethno-lingual, ethno-regional, ethno-religious, and ethno-racial identities (Shafiq, 2020); but the patriarchal culture is a regular feature of the Pakistani society from the pre-partition era (before Pakistan received independence from the British Indian Empire) (Iqbal, 2017).

In the patriarchal culture of Pakistan, the man is a bread-earner and head of his family (Cultural Atlas, 2022). Pakistan is predominantly a Muslim country and 96% of its citizens

follow the religion of Islam (Irfan, 2016; Pakistan Bureau of Statistics, 2017). The conduct of the life of a Muslim is shaped by the teachings of the Holy Book which is interpreted by the respective Imam or religious leader of every sect. Hence, Muslims approach these Imam or religious leaders when they encounter any difficulty in their lives including health problems, and traditional religious values are strongly followed in Pakistan (Shafiq, 2020). In Pakistani culture, gender roles and norms are based in traditional beliefs and society disapproves of men who experience sad emotions and crying; as these behaviours contradict the masculine traits of men i.e., being strong and powerful (Fatima, 2018). Therefore, men's mental health in general may not be a policy priority despite an overrepresentation of men in positions of authority in Pakistan (Pakistan Bureau of Statistics, 2019).

In social relationships, Pakistani men uphold their position of strength and authority by disavowing the presence of their own mental or psychological distress (Shafiq, 2020). As in a traditional patriarchal society of Pakistan, a man's revelation of experiencing any psychological or emotional distress can make him a subject of mockery for his peers (Javed et al., 2020). In most households in Pakistan, men are expected to be responsible for earning, and providing material and financial resources for the family (Cultural Atlas, 2022). In Pakistan, most families live in a joint family system where men are supposed to financially support their extended family members (Lodhi et al., 2021). This traditional approach of a man being the main source of income for his family in the Pakistani society may subject him to mental and psychological distress, especially during economic hardships.

The use of internet-based technology has shrunken the world and exposed people of one origin to the values and norms prevailing in other regions of the world. In this context, men are also expected to participate in chores and raising up their children (Landsberg, 2020). This shift

of values and behaviours are in conflict with patriarchal systems that predominated, historically (Landsberg, 2020). This phenomenon is occurring in Pakistan.

In a patriarchal culture where a man verbalizing emotional concerns is regarded as weakness, psychological distress is often exhibited in unspecific verbal and / or nonverbal ways including men directing anger towards others (Baldoni & Giannotti, 2020; Ridge et al., 2011). However, in the Pakistani culture, others who become the victim of such anger are often the man's family members. As a man learns from his father and male guardians to demonstrate his distress by beating his wife and children, but these forms of domestic violence are underreported in Pakistan due to the patriarchal nature of the society (Kirmani, 2021). This cultural norm of the Pakistani society is learned and practiced across generations.

In the patriarchal society of Pakistan, one of the acceptable masculine traits of being strong, is the absence of having any psychological distress in men (Saleem, 2021). This denial and neglect of experiencing any psychological distress may affect the mental, psychological, and physical health of Pakistani men. Likewise, in the Pakistani culture, the religious myth of reflecting upon mental health problems as a supranatural phenomena, may worsen existing psychological distress and contribute to development of a mental health condition (Javed et al., 2020). Also in Pakistani culture, distressed men may turn to illicit drugs, substance abuse, and alcohol ingestion, for finding a temporary escape from their pressing issues (Hussain et al., 2020). But, once, the effects of these substances are over, their mental and physical health may deteriorate further.

Regardless of their socioeconomic status, most of Pakistanis opt for non-allopathic medications; especially for the treatment of mental health illnesses (Shafiq, 2020). Due to the use of cultural practices when seeking health care in Pakistan, existing psychological distress and

mental health problems remain untreated and may worsen as time passes. Also, in the Pakistani media industry, most dramas and films depict and glorify the norms of a patriarchal society. Consequently, male dominance is reinforced for viewers and may incite them to demonstrate and maintain male dominance in their daily lives.

Critical Realism

In the context of research with first-time fathers in Pakistan, CR's ability to identify mechanisms and provide profound understanding of the causations that generate observable events and experiences offers new knowledge about the challenges faced by these fathers and their important contributions during the perinatal period. The philosophy of CR was developed by Roy Bhaskar in the 1970s and has been further refined and extended by him and other scholars (Koopmans & Schiller, 2022). CR was developed as an alternative approach to the philosophies of positivism and interpretivism / constructivism. It has been argued that CR is best-suited for conducting research in the fields of health sciences, social sciences, education, social work, community psychology, nursing, and midwifery (Brunson et al., n.d.; Koopmans & Schiller, 2022; Schiller, 2016). The philosophy of CR includes ontological and epistemological assumptions that are summarized in relation to our study context in the next sections.

Ontological Assumptions

The ontological assumptions of CR include independent reality, stratified reality, open system, causal mechanisms, and agency / agent and structure (Koopmans & Schiller, 2022; Wynn & Williams, 2012).

Independent Reality

The ontology of CR focuses on discovering the reality, which is independent of people's thought and consciousness, and undiscovered in the existing knowledge that is known as an intransitive aspect of knowledge (Koopmans & Schiller, 2022). Positivism relies solely on identifying general laws objectively, whereas interpretivism and constructivism are reliant upon theory-dependent knowledge generation (Koopmans & Schiller, 2022). In contrast to positivists and interpretivists / constructivists, critical realists believe that all knowledge can neither be observed objectively (as it is believed to be in the case of positivism), nor can it be experienced subjectively (as it is believed to be in the case of interpretivism / constructivism), because the existence of a causal mechanism or reality is independent of observations (Koopmans & Schiller, 2022). For example, fathers participating in our qualitative study wished for a normal delivery for their wives because they wanted to reproduce more offsprings to increase the strength of Muslims in the world. For them, this is the act of noble cause and will be rewarded by the Almighty hereafter.

Stratified Reality

In research approaches informed by the philosophy of CR, the reality or ontology is stratified in three layers: empirical, actual, and real (Koopmans & Schiller, 2022; Wynn & Williams, 2012). These three layers can be regarded as: experiences, events, and causal mechanisms (Koopmans & Schiller, 2022). The empirical layer is comprised of our experiences, senses, feelings, and observations (Koopmans & Schiller, 2022). The actual layer is comprised of the events which may or may not be observable to us (Koopmans & Schiller, 2022). The real layer usually consists of invisible or hidden forces that generate events and are referred to as

causal mechanisms or generative mechanisms (Koopmans & Schiller, 2022). For the men in our study, the empirical layer is the birth of a baby that made fathers happy, the actual layer is the increasing number of Muslims, and the real, invisible, layer is the noble reward that Muslim fathers will receive hereafter.

The philosophies of positivism and interpretivism equally recognize the presence of the first layer of reality i.e., the empirical layer (Koopmans & Schiller, 2022). The second and actual layer of reality is also appreciated by the positivism philosophy (Koopmans & Schiller, 2022). The distinct feature of the philosophy of CR is the final layer of reality i.e., the real layer; which requires critical realists to surpass the layer of experienced and observable factors for gaining deeper understanding of the casual mechanisms occurring at the real level (Koopmans & Schiller, 2022).

Open System

The real level exists and functions in an open system (Wynn & Williams, 2012). The open system is dynamic and cannot be controlled directly (Wynn & Williams, 2012). Because of its dynamic nature, reality is variable (Wynn & Williams, 2012). Therefore, in CR, attention is paid to identifying the predisposition of mechanisms working in a context-based environment, at a particular time (Wynn & Williams, 2012). For the men in our study, Muslim fathers' religious values about the purpose of procreation cannot be controlled by the state or government because of the strong influence of Pakistani society over state interests or the possibility of governmental actions – religious tenets and values supersede the human actions carried out in the name of state governance. This is evident with the prevailing fertility rate in Pakistan since 2021 to date. Despite rigorous efforts made by the government for controlling the fertility rate, Pakistan's

fertility rate (3.2) is the second highest in the South Asian region (*Pakistan Fertility Rate 1950-2024*, n.d.).

Causal Mechanisms

Positivists search for cause-and-effect relationships, and interpretivists perceive causality as meaning created from human activity (Koopmans & Schiller, 2022). However, critical realists believe that casual mechanism is not as simple as cause-and-effect relationships, nor can it be created from human activity alone (Koopmans & Schiller, 2022). On the other hand, critical realists believe in complexity of causality which includes identification of causal mechanisms, how they work, and under what conditions those mechanisms are activated (Koopmans & Schiller, 2022). For the men in our study, in the context of Pakistan, the causal mechanism for Muslim men feeling immense happiness on becoming a father is deeply rooted in their religious values.

Agency / Agent and Structure

Agency and structure are two separate, but interdependent, bodies (Koopmans & Schiller, 2022). Social structures enable or constrain the actions of agency, and in return, agents reproduce or transform social structures (Stutchbury, 2022). Therefore, it is important for critical realist researchers to focus on the multifaceted agency-structure association, for understanding the causal mechanisms of experiences and events.

Agency / Agent. Agent in the healthcare sector includes, but is not limited to, the healthcare providers, healthcare consumers (including patients, fathers, family members, caregivers), other staff working in healthcare settings, administrators, and policy makers

(Koopmans & Schiller, 2022). The other characteristics of the agent that also influence the interactions and inferences are the hopes, desires, judgements, and intents of each agent (Koopmans & Schiller, 2022). Although, agents can act freely, but in reality, their decisions are affected by external forces such as by other agents, structures, and available resources (Koopmans & Schiller, 2022). Through constructing these structures independently; agents reproduce, or resist, or change, or accept these structures (Koopmans & Schiller, 2022).

Structure. Critical realists believe that structures are powerful bodies and observable through their manifestations (Koopmans & Schiller, 2022). These structures come into existence via human social relationships and dealings (Koopmans & Schiller, 2022). The survival of the structure is dependent on agents' ability of reproducing or transforming it (Koopmans & Schiller, 2022). These social structures include but are not limited to social class, gender, and race/ethnicity; and agents interact and work within these social structures (Koopmans & Schiller, 2022). In this study, first-time fathers as agents interacted with social structure (e.g., ethnicity) and reinforced it by believing in religious connotation of procreation (i.e., receiving reward hereafter) and wishing to continue it.

Epistemological Assumptions

The epistemological assumptions of the philosophy of CR consist of mediated knowledge, explanation rather prediction, unobservability of mechanisms, and multiple explanations (Koopmans & Schiller, 2022; Wynn & Williams, 2012).

Mediated Knowledge

To understand causality / causal mechanisms in-depth, CR emphasizes exploring the relationships between agents, between structures, and between structures and agents / agency; for making inferences about intransitive domains of knowledge (Stutchbury, 2022). Contrary to positivism's supposition of producing common knowledge by observing the world; CR assumes that persons' ideologies, attitudes, and comprehension are shaped by their social interactions and are unfixed; indicating that the resultant knowledge is fallible and relative (Koopmans & Schiller, 2022). This resultant knowledge is known as intransitive knowledge. In other words, social structures / social interactions play a mediatory role in production of intransitive knowledge (Wynn & Williams, 2012). For the men in our study, the religious teachings or interpretations by religious leaders or scholars are the source of knowledge regarding the purpose of procreation in a Muslim society.

Explanation, Rather Prediction

The main reason for using a CR approach is to identify and explain the mechanisms that produced understudied events or experiences, rather than to predict possibility of the events occurring in the future (Wynn & Williams, 2012). In the philosophy of CR, it is believed that reality exists in an open system, rather than in a controlled environment (Wynn & Williams, 2012). The open system is flexible under the influence of complex agency-structure relationships; therefore, prediction is not the main goal of critical realists (Wynn & Williams, 2012).

Unobservability of Mechanisms

Critical realists believe that the presence of mechanisms cannot be denied due to their manifested effects (Wynn & Williams, 2012). Though, mechanisms are neither directly observed, nor measured, always (Wynn & Williams, 2012). Yet, these unobservable mechanisms can become observable with the development of new instruments or measures in the later phases of the research (Wynn & Williams, 2012). For instance, the religious values behind generating causal mechanism for the men in our study cannot be observed directly but can be investigated via research based on the philosophy of CR.

Multiple Explanations

Critical realists believe in the probability of having multiple explanations of a single outcome due to the multi-layered interplay happening in between the agency-structure union (Wynn & Williams, 2012). These multiple explanations can be either multi-final (i.e., similar circumstances or mechanisms leading to different results) or equifinal (i.e., different circumstances or mechanisms leading to similar results) (Wynn & Williams, 2012).

In summary, for the men in our study, not only religious teachings and values play a major role in experiencing fatherhood in Pakistan by Muslim men, but the role of strong Muslim society in Pakistan also contributes. Because the Muslim fathers living in other countries cannot afford more children due to the strong state rules, laws, and taxes prevailing in those countries. Hence, the approach of CR with the unobservable knowledge of the contextual factors of the society is essential for obtaining real understanding of the contextual and casual mechanisms behind the experiences of fathers in Pakistan.

Socio-Ecological Model (SEM)

In this regard, the interaction of individuals with four layers of society and its surroundings plays an important role in shaping their experiences of daily lives. The Socio-Ecological Model (SEM) framework was proposed by Urie Bronfenbrenner in the 1970s and the framework was developed into Ecological Systems Theory in the 1980s (Kilanowski, 2017; Lawrence & Ajibola, 2019). This model / theory is based on the interactions of an individual occurring with or between the five ecological systems (i.e.; microsystem, mesosystem, exosystem, macrosystem, and chronosystem), and its effects on human development (Kilanowski, 2017). In 1994, Bronfenbrenner revised the Ecological Systems Theory and renamed it the Bioecological Model (Evans, 2022).

The model / theory developed by Bronfenbrenner has several limitations (Evans, 2022). Research analyzing the mesosystems is inadequate in nature, hence the scope of effects of mesosystems on human development is ill-defined (Evans, 2022). The empirical testing of this theory is difficult because the direction by which the effects were produced by these ecological systems cannot be determined (Evans, 2022). This theory assumes that human development cannot be completed in absence of the effective ecological systems (Evans, 2022). This assumption can be validated for some people, but not for all humans (Evans, 2022).

In 2007, based on socioecology theory, the Centers for Disease Control and Prevention (CDC) developed a Socio-Ecological Model (SEM) Framework for guiding its disease prevention and health promotion programs (Agency for Toxic Substances and Disease Registry - ATSDR, 2022). This framework has four levels of factors: individual, relationship, community,

and societal, that affect a person's health (Agency for Toxic Substances and Disease Registry - ATSDR, 2022).

Level-1: Individual (Intrapersonal)

The first level consists of biological factors and further personal characteristics affecting the health of an individual such as age, education, income, health history, etc. (Agency for Toxic Substances and Disease Registry - ATSDR, 2022; *The Social-Ecological Model*, 2022). For fathers in our study, this level includes their limited knowledge (agent's characteristic) about hospital's policy (social structure) for delivery process that distressed them at that time when they were asked to give consent for their wife's C-Section.

Level-2: Relationship (Interpersonal)

The second level assesses the effects of close relationships on an individual's health like grandparents, parents, siblings, family members, peers, coworkers, etc. (Agency for Toxic Substances and Disease Registry - ATSDR, 2022; *The Social-Ecological Model*, 2022). For fathers in our study, this level includes being answerable to their families (agents) for providing consent to a gynecologist for conducting the C-Section procedure which made fathers worried at the time of their wife's delivery.

Level-3: Community

The third level investigates the effects of setting in which social relationships take place for example; school, neighborhood, workplace, place of worship, etc. (Agency for Toxic Substances and Disease Registry - ATSDR, 2022; *The Social-Ecological Model*, 2022). For fathers in our study, this level includes healthcare setting i.e., hospital (social structure) where

they admitted their wives for delivering the baby but were not allowed to be with their wives during the delivery process, which made them anxious at that time.

Level-4: Society

The fourth level explores the effects produced by the wide-ranging societal factors on an individual's health. Subfactors included in this level are policies, norms, culture, etc. (Agency for Toxic Substances and Disease Registry - ATSDR, 2022; *The Social-Ecological Model*, 2022). For fathers in our study this level includes the norms and policies of the hospitals regarding taking consent from the husbands for performing any procedure on their wives and not allowing them to be with their wives during delivery time. These norms and policies made them anxious and fearful at the time of their wife's delivery.

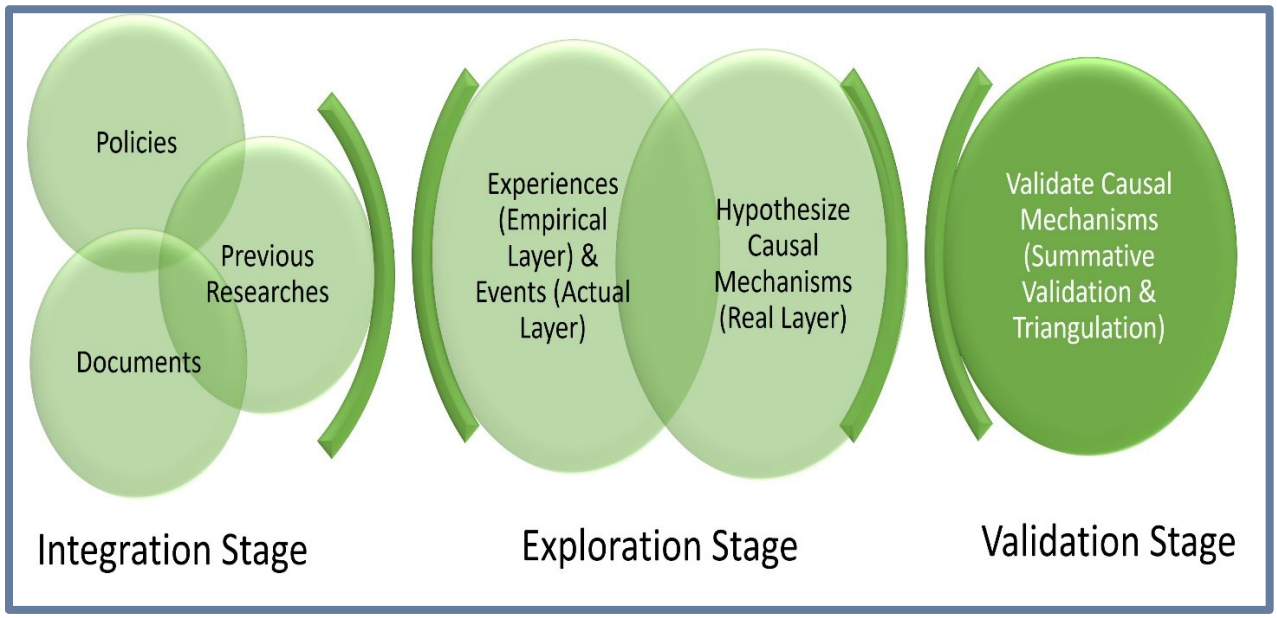
Framework for Integrating SEM into CR

CR-based research steps have been defined previously (Stutchbury, 2022; Wynn & Williams, 2012). However, we believe that integrating these two approaches (i.e., CR and SEM) is necessary to explore and understand the perinatal experiences of first-time fathers in Pakistan. Our integration entails using the first step described by Stutchbury (2021), and all steps described by Wynn and Williams (2012) (Stutchbury, 2022; Wynn & Williams, 2012). Therefore, we used the following six steps for conducting the CR-based research: (1) what is known about this situation? (2) explication of events / experiences, (3) explication of structure and context, (4) retroduction phase, (5) empirical corroboration, and (6) triangulation and multi-method (Stutchbury, 2022; Wynn & Williams, 2012).

For validating the causal mechanisms responsible for producing the experiences / events for men becoming first-time fathers in Pakistan, we integrated CR with SEM. This framework integration occurred in three stages: (1) integration stage, (2) exploration stage, and (3) validation stage (see Figure 1).

Figure 1

Process Framework for Integrating SEM into CR



The steps included in these three stages are: (1) integration of situation, (2) exploration of experiences (empirical layer), (3) exploration of events (actual layer), (4) hypothesize causal mechanisms (real layer), (5) summative validation, and (6) triangulation (see Table 1).

Table 1

Steps for Integrating SEM into CR

Stages	Steps

Integration Stage	Step-I: Integration of Situation
	Step-II: Exploration of Experiences (Empirical Layer)
Exploration Stage	Step-III: Exploration of Events (Actual Layer)
	Step-IV: Hypothesize Causal Mechanism (Real Layer)
Validation Stage	Step-V: Summative Validation
	Step-VI: Triangulation

Stage-I: Integration Stage

This stage refers to the empirical layer of reality. It can include already conducted researches and government policies or documents (Stutchbury, 2022). In this Thesis, a scoping review was conducted for exploring the existing literature about contributing factors for developing paternal perinatal psychological distress (PPPD) in first-time fathers, and the results of this scoping review was categorized and discussed according to the four levels of the SEM framework. The SEM framework also helped in analyzing the results of the qualitative descriptive phase of this thesis. No government policies were identified for supporting first-time fathers during perinatal period in Pakistan.

Step-I: Integration of Situation

For conducting this step, we searched for the Pakistani government policies related to supporting fathers during the perinatal period of their wives but did not find any. The reason behind the non-existent of any policy for supporting fathers could be found in the composition of the Pakistani government which is male dominated. Hence, for forming any policy for

supporting fathers during perinatal period will result in officially recognizing that fathers can also experience psychological distress, which can compromise their official position of being the 'head of the family' and can stigmatize them as 'weak'.

Then, we included the results of our scoping review conducted recently about the risk factors contributing to the development of psychological distress among first-time fathers during perinatal period. The results of the review revealed that no prior study was conducted regarding the experiences of men becoming a father for the first-time in Pakistan. This revelation led us to investigate the experiences of men becoming a father for the first-time in Pakistan. While analyzing the results of the scoping review, we found that data started clustering around the layers of the SEM framework developed by the CDC (Agency for Toxic Substances and Disease Registry - ATSDR, 2022).

Stage-II: Exploration Stage

All three layers of reality (i.e., empirical, actual, and real) are explored in this stage. Events and experiences related to the under-researched phenomenon are identified and described which is followed by the exploration and analysis of the structure, contextual environment, and agency; causally relevant for generating these experiences, events, and outcomes (Wynn & Williams, 2012).

Step-II: Exploration of Experiences

Experiences are defined as the directly observable events, through our sensory assessment or tools but being in an open system, it is hardly possible to observe experience

directly (Wynn & Williams, 2012). Therefore, studies are conducted to identify and explore the experiences occurring in the real world and are unobservable directly (Wynn & Williams, 2012).

In this step, we included the experiences of men becoming father for the first-time in Pakistan. For this reason, we created detailed narrative summaries of the experiences that study participants had shared with our research team. These narrative summaries are reported in Chapter 4 of this Thesis.

Step-III: Exploration of Events

An event is identified as a particular happening or action, as a result of the functioning of one or more mechanisms (Wynn & Williams, 2012). There is a possibility of the occurrence of a changeless event due to the neutralizing effects of one or more other mechanisms (Wynn & Williams, 2012). Also, it is likely that the effects of one mechanism can intensify the outcomes of another mechanism (Wynn & Williams, 2012).

For conducting this step, we identified the events and outcomes described by the study participants and mentioned them in the narrative summaries, based on the participants' verbatim interview transcription. Researchers' field notes and reflective diaries were also used for creating the detailed narration of participants' verbatim interview transcription. These narrative summaries are reported in Chapter 4 of this Thesis.

Step-IV: Hypothesize Causal Mechanism

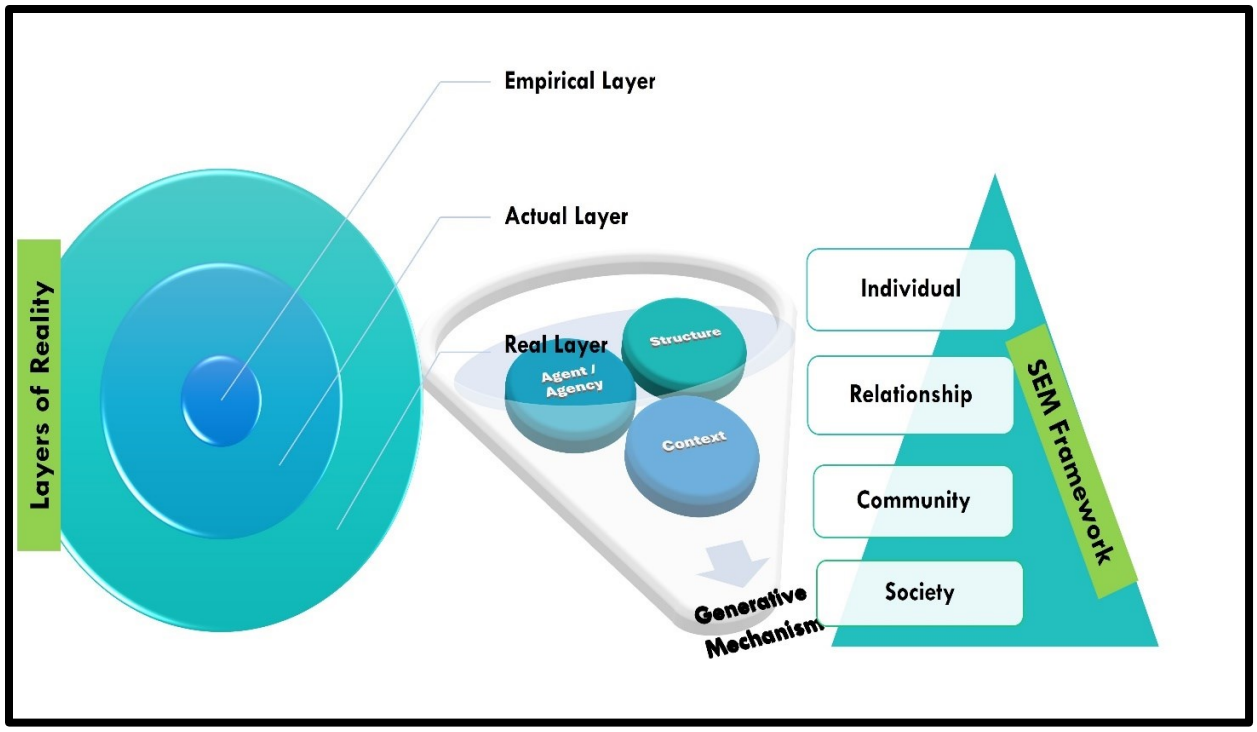
In-depth narration of the participants' experiences, events, and outcomes helps researchers in uncovering the complex interplay between structure, agency, and context, and will lead them to hypothesize the causal mechanisms behind these experiences and events (Wynn &

Williams, 2012). Various rationalizations are proposed by researchers for unfolding and hypothesizing causal mechanisms situated within a social structure, for the observed events (Wynn & Williams, 2012). Researchers' own experiences, values, and existing theory also facilitate this stage (Wynn & Williams, 2012).

Correspondingly, during this stage, we explored and hypothesized the causal mechanisms behind men's experiences of becoming a father for the first-time in Pakistan. This is the stage where we incorporated the CDC's Socio-Ecological Model (SEM) into CR philosophy for facilitating the exploration, analysis, and hypothesis of the underlying causal mechanisms behind the first-time fathers' experiences in Pakistan. During the integrating process, we observed that the components of generating causal mechanism (i.e., structure, agency, and context) were parallel with the layers of the SEM (i.e., individual, relationships, community, and society). Both approaches, SEM and CR accept the influence of human beings and their wishes, desires, judgements, actions, etc. (i.e., 'individual layer' in SEM, and 'agency' level in CR), on any phenomenon being experienced. Similarly, both approaches endorsed the role of relationships, community, society, and social structures in producing the related experiences and events (i.e., 'relationships, community, society' layers in SEM corresponding to the 'agency, structure' levels in CR). Lastly, neither approach denied the hidden effects of context on humans' experiences, events, and outcomes. The integration of both approaches at Real level of reality is well-depicted in the below Integration Model for SEM and CR (see Figure 2). Further findings from these causal mechanisms are reported in Chapter 4 of this Thesis.

Figure 2

Integration Model for SEM and CR



Stage-III: Validation Stage

This stage refers to the validation of causal analysis, its hypothesis, and triangulation of the study. There are two steps in this stage: summative validation and triangulation. These two steps are described below.

Step-V: Summative Validation

The concept of 'summative validity' strengthens the study by confirming the researcher's understandings of and hypotheses about experiences studied with participants (Wynn & Williams, 2012). Congruently, to be confident about the hypothesized causal mechanisms of our study, we compared the causal analysis of one participant with others and shared the narrative summaries of their verbatim interview transcription with them, for their review and feedback.

Their feedback about the summaries validated our hypothesized causal analysis of the experiences and events as lived by them. Results from this summative validation are reported in Chapter 4 of this Thesis.

Step-VI: Triangulation

It is essential for the researchers to include various approaches in support of their causal analysis (Wynn & Williams, 2012). Triangulation can be achieved in a study by including multiple data sources and theory / model / framework (Wynn & Williams, 2012). The use of multi-method for validation of the hypothesized mechanisms and study findings, facilitates researchers in overcoming their perceptual barriers (Wynn & Williams, 2012). Likewise, we used a multi-method research approach (i.e., our scoping review, followed by the qualitative study) and SEM framework using CR philosophy for validating the hypothesized causal mechanisms and reducing, if not, eliminating our biases in the study.

Conclusion

In this paper, we have described how we integrated the SEM into CR-based research by developing an Integration Model, Process Framework, and Steps for conducting a meaningful integration. This integration approach may be beneficial in investigating the contextual hidden forces responsible for generating experiences and events on the empirical level as experienced by people living in any society; however, this needs to be further tested in other contexts. Policies and interventions formed based on the given societal circumstances may help in producing sustainable outcomes for understudied populations, such as first-time fathers experiencing perinatal psychological distress in Pakistan. This ought to improve the health indicators and reduce health disparities prevailing in many societies.

A researcher's limitation for using this integrated approach is having superficial knowledge of the society and its subcultures from which each study participant belongs to. Another limitation to this approach is that it is challenging, especially if not all of the research team members belong to any participant's culture and society. In this case, at first, researchers need to fully be immersed themselves in the participants' background and culture before they interpret the findings according to the CR philosophy and SEM levels.

Despite these limitations, this integrating model approach can be promising for understanding the difficulties and challenges faced by first-time fathers during their wife's perinatal period, along with understanding of the origin of these challenges. Once the challenges and their origins are identified, contextual policies can be formed to address the symptoms experienced by first-time fathers during the perinatal period. Subsequently, context-relevant measures can be taken to reduce the perinatal psychological distress which first-time fathers can experience at that time. If the developed policies and measures are contextually relevant, the probability of their acceptance by society increases.

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Transition to Manuscript Three (Data based Paper)

The results of the first manuscript, a scoping review about risk factors contributing to PPPD provided a foundation for this qualitative descriptive study which is the second phase of the thesis. The results of the scoping review indicated the presence of PPPD in one first-time fathers and included evidence of the phenomenon is at least one Pakistani father. Due to negligible representation of first-time Pakistani fathers in the existing research conducted on the risk factors contributing to the development of PPPD in them, and lack of any comprehensive study on the experiences of first-time Pakistani fathers there was a need to conduct the qualitative descriptive research for this thesis.

The qualitative descriptive research of this thesis aimed to obtain a more comprehensive understanding about the perinatal experiences of first-time fathers in Pakistan. The research also aimed to attain explanations about those experiences by uncovering the causal mechanism(s) beneath them, and to recognize the role of agents, agencies, and social structures in generating these mechanism(s) in the context of Pakistan. For these purposes, CR philosophy was used with integration of the SEM framework.

A total of eight first-time Pakistani fathers fulfilling the eligibility criteria of the study were recruited in this research. These fathers were grouped into two phases of the perinatal period, the prenatal phase, and the postnatal phase up to six months post-delivery. Each group included four participants in the respective phase of the perinatal period. Before recruiting participants for the study, fathers were screened for the presence of psychological distress to eliminate the result biases. Kessler's K-6 Scale was used for the screening purpose. No

participants met the threshold to be excluded from the study because of psychological distress symptoms.

Data was collected via semi-structured, individual, in-depth interview, and completion of a Demographic Data Form and Health Information Form. For data collection purposes, the interview guide and biodata form were developed in consultation with the members of the Community Advisory Board (CAB). The CAB consisted of five first-time fathers having a child under two years of age. All participants preferred to give interviews at their homes on the weekend. Interviews were taken in a separate room to maintain the privacy and confidentiality of the data and the participants. Two male research associates (RAs) were trained for data collection. All study data will be retained for a period of five years. After completion of the five years of data collection, the electronic or digital data will be deleted, and the manual data will be shredded.

The data was analyzed in the two perinatal phases (prenatal, and postnatal up to six months post-delivery) by using the Inductive Content Analysis (ICA) approach and the CR philosophy and SEM integrated developed specifically for this study. Overall, the results revealed the multifaceted relationship between agents and social structures in generating the perinatal experiences of first-time fathers in the context of Pakistan at all levels of the SEM framework. Religion, economic conditions, and hospital and government policies were found to be major contributors to the perinatal experiences of first-time fathers in the context of Pakistan.

Chapter Four

Qualitative Study of Men's Experiences of Becoming a Father for the First-time in Pakistan: A Critical Realist Perspective

Sadaf Zindani, PhD Candidate, RN[1]

Julie Chartrand, Associate Professor, RN, PhD[2]

Jean Hannan, Associate Professor, RN, APRN, PhD, FAAN[3]

J. Craig Phillips, Professor, LLM, PhD, RN, ACRN, FAAN, FCAN[4]

[1,2,4]School of Nursing, University of Ottawa, Ontario, Canada

[3]Nicolo Wertheim College of Nursing & Health Sciences, Florida International University, Miami, USA

Author Note

Sadaf Zindani (SZ) https://orcid.org/0000-0001-8069-5487

Julie Chartrand (JC) https://orcid.org/0000-0001-9075-054X

Jean Hannan (JH) https://orcid.org/0000-0003-3740-620X

J. Craig Phillips (JCP) https://orcid.org/0000-0002-6697-0515

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Abstract

Keywords: Critical Realism, Socio-Ecological Model, Pakistan, Qualitative, First-time Fathers, Perinatal, Mental Health

Background: Most research into experiences during the perinatal period has focused on mother's experiences. There is a knowledge gap about fathers' experiences during the perinatal period globally. There is limited literature on the experiences of first-time fathers during the perinatal period in the context of Pakistan.

Methods: This is the first study which aims to explore the broader experiences of first-time fathers during the perinatal period in Pakistan and obtain clarifications about those experiences. A qualitative descriptive research approach was used to conduct this study. A total of eight first-time fathers were recruited according to the eligibility criteria of the study. Participants were grouped into the two phases of the perinatal period: (i) prenatal phase, and (ii) postnatal phase up to six months of delivery. Four participants were included in each group. Participants were interviewed individually at their homes.

Results: Data for each group were analyzed separately for the two phases of the perinatal period by using Inductive Content Analysis (ICA) technique and Critical Realism (CR) philosophy with integration of the Socio-Ecological Model (SEM) framework. Results revealed the multifaceted relationship between agents and social structures in contributing to the perinatal experiences of first-time fathers in the context of Pakistan on all levels of the SEM framework. Religion played a strong role in shaping up the first-time Pakistani fathers' experiences in both the prenatal and postnatal phases of the perinatal period. The economic conditions of the country made fathers stressed about their child's future and meeting family expenses. Hospital and government

policies were a major concern for postnatal fathers in Pakistan. All fathers developed a sense of responsibility after getting the news of becoming a father for the first time and became more considerate of their wives.

Conclusions: The integration of CR and SEM may help nurses and other healthcare providers to support first-time fathers and their families across all socioecological layers during perinatal period. Hence this integration may offer hope for improving the experiences of first-time fathers during the perinatal period of their wives. This integration can also assist policymakers for and researchers for developing strategies and interventions on all four socioecological layers to support first-time fathers in Pakistan.

Qualitative Study of Men's Experiences of Becoming a Father for the First-time in Pakistan: A Critical Realist Perspective

Transitions in one's life are inevitable as people move from one stage to another. Some life transitions are significant in nature, and becoming a parent is one of the key transitions in couples' lives (Clark et al., 2019). Becoming a father for the first-time is a paramount transformation in men's lives, and is influenced by various socioecological factors (Leahy-Warren et al., 2023; Molloy et al., 2022). Traditionally, maternal mental health during the perinatal period has been the focus of researchers, policymakers, and practitioners (Azzam et al., 2022; Molloy et al., 2022). Recently, researchers started giving attention to fathers during the perinatal period but mostly for supporting mothers rather than purely focusing on the experiences, needs and challenges of the fathers (Molloy et al., 2022; Onyeze-Joe & Godin, 2020).

Nursing is a discipline in which nurses are trained to understand lifecycle transitions from birth to death (Deliktas et al., 2019). For the last four decades, nursing researchers have been in quest of gaining better understanding of men becoming a father, mostly in the USA, Canada, Australia, and some European countries (Sansiriphun et al., 2010). However, research in these contexts focus on men's negative experiences during their wife's perinatal period (Sansiriphun et al., 2010). Only a few studies have reported the comprehensive experiences of men during their wife's perinatal period (Sansiriphun et al., 2010). Similarly, an abstract of a single study was found that explored the experiences of first-time fathers in Pakistan, which only focused on the postnatal period of their wives (Pirani & Karmaliani, 2015b, 2015a), and further details on that study are not available.

Pakistan, being the second largest Muslim country in terms of its population, gained independence from the United Kingdom in 1947 (Pakistan Bureau of Statistics, 2017; Shafiq et al., 2020). Pakistan is a male-dominant country since its conception (Fatima, 2018), and patriarchy is a regular feature of Pakistani society (Iqbal, 2017). The Brief on Census 2017 concluded the total population of Pakistan was 207.68 million, out of which 51% are males (i.e., n = 106.3 million) (Pakistan Bureau of Statistics, n.d.). The legal age for marriage in Pakistan is 18 years old (Pakistan Today, 2023). It was estimated from the Census 2017 data that out of 51% of males, 41% of men were legally eligible for marriage in Pakistan.

Being a male-dominant country, having a fertility rate of 3.76 births per woman in 2017, and despite 41% of the male population being at the legal age of marriage in 2017, no previous research has been conducted to explore the contextual experiences and the underlying reasons for those experiences among first-time fathers in Pakistan. The Principal Investigator – PI (i.e., I) suspects that cultural differences about causal mechanisms between Pakistani men and men in other parts of the world may be different which needs to be explored and described in the context of Pakistan. Likewise, there may be similarities that transcend cultures and need to be highlighted in relation to the literature from other parts of the world.

Methods

The purpose of this qualitative descriptive research was to identify and seek explanations about the causal mechanism(s) behind the experience(s) of men becoming first-time fathers in Pakistan, under the philosophy of Critical Realism (CR); by exploring the role and relationship of structure and agency in generating those mechanism(s), which have never been explored in Pakistan. Various socioecological factors affect the way people experience different transitions in

life (Torche & Rauf, 2021). Therefore, the Socio-Ecological Model (SEM) framework developed by the Centers for Disease Control and Prevention (CDC) was integrated with the philosophy of CR developed by Roy Bhaskar. This integration assisted the researchers in gaining deeper, contextual, and socioecological factorial understanding of the casual mechanism(s) responsible for generating fathers' experiences during perinatal period in Pakistan.

The main purpose of the CR philosophy is to propose a complete understanding about the understudied phenomena including the causations / causal mechanism(s) that produce observable events and experiences (Brunson et al., n.d.; Koopmans & Schiller, 2022; Schiller, 2016). CR emphasizes investigating the uncharted reality underlying experiences and events (Koopmans & Schiller, 2022). The reality is stratified in empirical, actual, and real layers (Koopmans & Schiller, 2022). The reality is not fixed and changes according to context (Wynn & Williams, 2012).

The CDC's framework of SEM consists of four layers (*Principles of Community Engagement - Second Edition*, 2015). These layers are individual, relationship, community, and societal (*Principles of Community Engagement - Second Edition*, 2015). These layers interact with each other and leave profound effects on the health of an individual (*Principles of Community Engagement - Second Edition*, 2015). Simultaneously, these layers can become the sustainable source of targeted action for health promotion of individuals and their families (*Principles of Community Engagement - Second Edition*, 2015).

Research Questions

The research questions for this study are: what is / are the causal mechanism(s) behind the experience(s) of men becoming a first-time father in Pakistan? and What is the role of structure and agency in generating those mechanism(s)?

Setting and Sample

First-time fathers availing the perinatal services for their wives at the Saifee Hospital, Karachi (SHK), were recruited for the study. On average, 70-75 patients (from all specialties of medicine and surgery) are served daily at the SHK. Permission to engage with staff and potential research participants for collecting data was obtained from the Chief Executive Officer (CEO) of the SHK, after giving him the description of the study.

Research undertaken under the philosophy of CR needs to be an in-depth, small scale, and intensive study, having a limited number of study participants for thoroughly and systematically identifying and analyzing the causal mechanism(s) responsible for the understudied phenomenon, experience(s), event(s), and outcome(s) (Stutchbury, 2022). Therefore, this qualitative study was conducted on a small scale, working closely with a limited number of participants; eight Pakistani men becoming a father for the first-time.

Participants Distribution Scheme

Individual, in-depth interviews were conducted with eight first-time fathers at their homes according to their feasible date and time. Study participants were grouped based on phases of peri-natality into two groups: (1) first-time fathers during their wife's prenatal period, or (2) first-time fathers during their wife's postnatal period, up to six-months post-delivery. Each

group consisted of four first-time fathers. To insure cultural and gender sensitivity, two male Research Associates (RA) were hired and trained by the PI to collect data from the eight first-time fathers. Each RA collected data from four participants belonging to one group. PI listened, re-listened, and transcribed all the interview recordings to be familiar with the data. The interview data were transcribed and translated in English. All transcriptions and translations made by the PI were verified by the members of the Community Advisory Board (CAB). The description about 'Formation of CAB' is provided later in this chapter.

Eligibility Criteria

Inclusion criteria for the participants were: first-time biological fathers, in perinatal period, opposite sex couple, can comprehend English or Urdu language, and agree to give consent and participate in the interview. Potential participants were excluded from the study if they were experiencing acute, moderate level of psychological distress; had a preterm baby; or had adverse pregnancy outcomes as the interview given under these conditions could worsen their psychological distress and distress under these conditions was not the focus and is beyond the scope of this study.

Screening of Participants

To screen potential participants for psychological distress, Kessler's K6 Scale (with Urdu translation) was administered by a research team member (see Appendix N) (Kessler et al., 2003). The K6 scale is reported to be the most efficient scale for screening individuals with serious mental distress, and the internal consistency and reliability of the K6 Scale is reported to be ($\alpha = 0.89$) (Kessler et al., 2003). Potential participants scoring > 4 on the K6 scale (Prochaska et al., 2012), were considered to have a moderate level of psychological distress and were

excluded from the study. The sensitivity and specificity of the K6 Scale for screening people having a moderate level of mental distress is reported to be 0.76 and 0.75 respectively (Prochaska et al., 2012). If a potential participant would have been excluded for having a moderate level of psychological distress, they would be given a list of mental health resources available in Pakistan (see Appendix I) and offered the opportunity for referral to the house physician of the SHK for further evaluation. No participants were screened as ineligible for scoring > 4 on the K6 scale.

Regarding screening potential participants for having a preterm baby or an adverse pregnancy outcome, two forms (Demographic Data Form and Health Information Form) were administered to obtain relevant information (see Appendix Q and S). These forms included some medical history information that helped in identifying the preterm birth and adverse pregnancy outcomes which falls under the exclusion criteria of this study. However, potential participants excluded from the study because their child was born prematurely or their wife had an adverse pregnancy outcome, they would be given a list of mental health resources (see Appendix I) and offered referral the house physician at SHK. No contacted fathers had a preterm birth or adverse pregnancy outcome.

Data Collection

To conduct this study, qualitative data was collected from first-time fathers during their wife's perinatal period, which includes the prenatal period and the postnatal period until six months post-delivery (to avoid recall bias). The nursing staff working in the Obstetrics & Gynecology clinic and inpatient unit of the SHK helped identify potential study participants. The identified potential participants were approached by the RAs. Before consenting to the study,

participants had the opportunity to ask questions and obtain clarification from the respective RA and / or PI, related to any questions or concerns they had about the interview process and / or study. The Informed Consent was written in both Urdu and English (see Appendix F and G). The CAB helped the PI in translating the Informed Consent into Urdu (see Appendix G).

After giving a brief explanation of the study and obtaining their informed consent in writing, RAs screened potential participants for any acute psychological distress with the K6 Scale. None of the potential participants scored > 4 on the K6 Scale. Participants scoring < 5 on the K6 Scale, filled out both the forms, and followed by being interviewed. Both the forms were developed in English by the PI and translated in Urdu by the PI and CAB (see Appendix P, Q, R, and S). forms were filled out by the RAs. The PI and RAs are all fluent in both English and Urdu.

Demographic Data Form (see Appendix P), Health Information Form (see Appendix R), and an Interview Guide (see Appendix J) were developed by the PI in consultation with the Thesis Supervisor and Thesis Advisory Committee (TAC) members and were shared in the first CAB Meeting for review and approval by the CAB members. The CAB suggested modifications that were incorporated into both the forms and Interview Guide, after consulting with the Thesis Supervisor. The CAB translated the final version of the Demographic Data Form, Health Information Form, and Interview Questions, in Urdu (see Appendix L, Q, and S). The final version of the interview questions was used for the data collection process. The interview guide questions were asked with probes such as ‘Please clarify or describe this to me with an example’, ‘What makes you think/feel that?’, and ‘Please explain’. Interviews were conducted in Urdu and audio-recorded and, translated to English for analysis by the PI.

Before starting data collection and interviews, the RAs briefly explained to participants about the study and audio-recording of the interviews, and the participants written informed consent was obtained signifying their willingness to participate, and that they understand that their participation is voluntary, and that they can withdraw from the study at any time without consequences to them, their wives, or their child (fetus or infant, depending on the phase of the perinatal period), for withdrawing from the study. The Biodata Form helped in gathering demographic and medical data about the study participants. The demographic information of the participants strengthened the analysis of the data, and the medical information helped the researcher to screen eligible participants.

Demographic information in the Demographic Data Form included ethnicity, socioeconomic status, education level, age, ethnicity, occupation, type and area of residence, income level, religious identity, type of family, etc. (see Table 2). Medical data collected included the participant's information i.e., name, contact number, email address, experiencing any physical or mental illness, the month of pregnancy, delivery date, age of newborn, sex of newborn, and whether medications are currently being taken (see Table 2).

Qualitative data was collected from eligible participants individually, via in-depth, semi-structured, face-to-face, in-person interviews. The day and time for conducting the interview was set as per the participant's preference. As per the individual participant's comfort, privacy, and feasibility; the interviews were conducted at the participant's home. Each interview lasted about 45-50 minutes. Interviews were audio-recorded with the participant's consent. The interview guide consisted of the questions regarding first-time fathers' experiences during their wife's pregnancy, delivery, and postdelivery period; the reasons behind those experiences; the way by which they manifested their experiences; the reasons behind the ways they manifested their

experiences; and the ways by which their stress / anxiety could have been reduced at the time it was experienced. The participants were informed about the possibility of the clarification and study findings verification process, and a means to communicate with them in the future was established at the time of obtaining their written consent. The data collection was sustained until the adequacy of the data was achieved.

Initially, the PI listened to the recorded interviews of both RAs. Once the PI was satisfied with the interview process, then the RAs proceeded with the next interview. If further clarification was required after the PI listened to the recorded interview, the RA who completed the interview approached the same participant for clarification purposes. During the data collection process, Field Notes (non-verbal clues of participants) and Reflective Diaries (experiences and feelings of RAs) written in English by both RAs were included in the study datasets by the PI. Field Notes and writing Reflective Diaries assisted the PI in documenting study findings, data validation, and in reflecting on the interview process.

The participants were assigned a unique identification number, and the digital data was password protected electronically. The manual data (i.e., hardcopy of the data) and audio recording are kept secured in a locked cabinet. Both RAs were instructed to maintain the privacy of the information received during the data collection process and asked to sign a confidentiality agreement. The participants can refuse to disclose any information. They were advised there would be no consequences to them, their wives, or child for refusing. They were free to withdraw from the study at any time.

Hiring and Training of RAs

Two male nursing interns were hired on to the position of Research Associate (RA). For hiring RA, a written announcement was posted in the Saifee Hospital. The PI trained both RAs in all aspects of data collection, management, obtaining informed consent, and human subject considerations. For this purpose, the PI developed a Training Protocol for RAs (see Appendix T). Both RAs and the PI conducted a mock interview with a specialist nurse working in the obstetric department, as part of their training. The PI monitored the mock interview of RAs.

Formation of CAB

A CAB including five fathers was formed to guide the research process and inform recruitment efforts. All the CAB members were first-time fathers, having babies under two years of age. The CAB supported the PI in translation and informing data analysis activities and processes. The CAB helped the PI in translating the Informed Consent, Recruitment Text for Participants, Demographic Data Form, Health Information Form, and Interview Questions, in Urdu (see Appendix G, L, O, Q, and S).

Risks and Benefits to Participants

The study did not have any direct benefit for the participants. However, the individuals expressed satisfaction sharing their experiences of becoming a father for the first time. Because this was the first study of its kind in the context of Pakistan, it helped in identifying and exploring the causal mechanism(s) underlying the experience(s) of men becoming a father for first-time in Pakistan, by discovering and documenting the nature of the relationships between socioecological layers, context, structure, and agency in generating those mechanism(s).

Data Confidentiality and Validity

Both RAs were involved in collecting and validating the data findings. CAB members facilitated validity of the transcription, translation, and data findings. Therefore, both RAs and CAB members signed the Confidentiality Agreement before starting their research activities, to maintain the confidentiality of the data and the study participants.

The participants were assigned a unique identification number i.e., the participants belonging to the prenatal group were given the identification number preceded by the "PR" abbreviation, and the participants belonging to the postnatal group were given the identification number preceded by the "PP" abbreviation. The digital data was password protected electronically, stored in the PI's hard drive, and kept in the PI's locked cabinet. No study data was stored on personal laptops or computers. All study data will be retained for a period of five years. The retention period started after completion of the entire data collection. After completion of the five years of data conservation, the electronic or digital data will be deleted, and the manual data will be shredded.

Data Analysis

Data analysis was conducted in two groups: (1) prenatal period, (2) postnatal period up to six-months after the child's birth. The Inductive Content Analysis (ICA) technique was used for the purpose of data analysis. The use of ICA with CR approach improves the rigor, practicality, and utility of the study findings (Leung & Chung, 2019). Hence, the data was analyzed by using the five steps of the ICA technique and five steps of CR philosophy with integration across the four layers of the SEM. The scheme of data analysis is presented below (see Table 1)

Table 1

Data Analysis Scheme

Inductive Content Analysis (ICA)	Critical Realism (CR)
Step-I: Read and Familiarize	
Step-II: First-Round Coding	Step-II: Explication of Events / Experiences
Step-III: Second-Round Coding	Step-III: Explication of Structure and Context
Step-IV: Refine Subcategories	
Step-V: Synthesis and Interpretation	Step-IV: Retroduction Phase with SEM Layers
	Step-V: Empirical Corroboration
	Step-VI: Triangulation and Multi-Method

Step-I: Read and Familiarize

Data collection and data analysis occurred concurrently, starting with the first interview. The PI listened, transcribed, and translated the interviews to become fully conversant with the data. The PI also read the field notes and reflective diaries maintained by the RAs for validation purposes.

Step-II: First-Round Coding

In this step, after narrating the interview, the sections of the text are identified and labelled according to the research questions (Vears & Gillam, 2022). The second step of ICA technique coincided with the second stage of CR in which after narrating the interviews in-depth, the PI broadly labeled or categorized the text as per the research questions. The field notes and

reflective diaries written by the RAs were also made part of the data analysis and helped in validating the categories and subcategories generated during the data analysis process.

Step-III: Second-Round Coding

At this stage, the already coded text sections in the earlier step were revisited to identify the structures, context, and agency presented in the data. This activity produced the subcategories of the previously identified categories in the earlier step. Correspondingly, this step fell under the third step of the CR (i.e., explication of structure and context).

Step-IV: Refine Subcategories

After labelling or coding all the text into categories and subcategories, the subcategories were compared again so that the similar subcategories can be unified into similar subcategory and the dissimilar subcategory should be kept separated. To assure the reliability and validity of the generated codes, categories, and subcategories, consistency and agreement was sought among all the data coders (i.e., PI and Thesis Advisory Committee members). Data was coded twice by two different coders and then compared for agreement. Discrepancies were discussed among the team for consensus.

Step-V: Synthesis and Interpretation

The interpretation of the data is an important step in the ICA technique (Vears & Gillam, 2022). Similarly, the Retroduction phase is a crucial stage in CR (Wynn & Williams, 2012). Hence, the fourth stage of CR correlated with the last step of ICA, in which the understudied phenomenon, experience, event, or outcomes was hypothesized and interpreted in terms of the causal mechanism(s) that could have generated them. During synthesis and retroduction phase, it

was observed that data clustered around the four layers of the SEM framework developed by the CDC. Hence, the results were interpreted using the SEM as an organizing framework.

The triangulation technique was used for establishing the validity of the analysis by looking at the coded text reflecting a similar meaning to the formed ICA categories. The results or findings of the data were validated with the study participants. For the validation purposes, the summary of results and key findings were translated in Urdu, and RAs contacted the respective participants for validation purposes. The results and findings are represented here in narrative, tabular, and graphical forms.

Ethical Considerations

The PI is Good Clinical Practice (GCP) certified and trained all the team members in the study procedures, human subject protection, and maintaining confidentiality and privacy of the data. The study was approved by the Office of Research Ethics and Integrity, University of Ottawa (Certificate of Ethics Approval, H-02-23-8846). Permission for accessing the study population was obtained from the SHK Chief Executive Officer.

Results

Findings from this study are reported for each participant group: (1) prenatal period, and (2) postnatal period up to six-months after delivery. The age range of fathers in the prenatal group was 26-35 years and in the postnatal group was 31-38 years. Most of the fathers in both groups had acquired education up to graduation level (i.e., graduate degree). Most of the fathers in both groups earned 1-2 lacs PKR per month (CAD 487.92$ - 975.58$. As of March 26, 2024; 1 CAD$ = 204.95 PKR). However, one father in the prenatal group earned below 50,000 PKR

per month (CAD < 243.96$. As of March 26, 2024; 1 CAD$ = 204.95 PKR). Another father in the postnatal group earned 300,000 PKR per month (CAD 1463.77$. As of March 26, 2024; 1 CAD$ = 204.95 PKR). Half of the prenatal fathers were employed, and half were running their own businesses. Most of the postnatal fathers were employed and only one father was running his own business. Half of the fathers in both groups were living in a nuclear family and half of them were living in a joint family system. Most prenatal fathers were living in an underdeveloped area and only one father was living in a well-developed area. All fathers in the postnatal group were living in well-developed areas. None of the fathers had any medical history and neither of them took any medications. Most of the prenatal fathers had only experienced the first trimester of pregnancy and only one father experienced the second trimester of pregnancy. Among fathers in the postnatal group, most of the deliveries were conducted via C-Section and only one delivery was conducted using forceps. Most of the children were male, except one female child. Sociodemographic and medical data for both groups is presented in Table 2.

Table 2

Sociodemographic and Medical Data

Study Participants in Prenatal Group		Fathers in Postnatal Group (up to Six-Months Postdelivery)	
Age Range:	26-35 Years	Age Range:	31-38 Years
Education:	Graduation (*n* = 3, 75%)	Education:	Graduation (*n* = 3, 75%)
	8th Standard (*n* = 1, 25%)		Undergraduate (*n* = 1, 25%)
Income:	1-2 Lacs (*n* = 3, 75%)	Income:	1-2 Lacs (*n* = 3, 75%)
	<50,000 (*n* = 1, 25%)		>300,000 (*n* = 1, 25%)

Work:	Employed (*n* = 2, 50%)	Work:	Employed (*n* = 3, 75%)
	Business (*n* = 2, 50%)		Business (*n* = 1, 25%)
Family:	Nuclear (*n* = 2, 50%)	Family:	Nuclear (*n* = 2, 50%)
	Joint (*n* = 2, 50%)		Joint (*n* = 2, 50%)
Residence:	Underdeveloped (*n* = 3, 75%)	Residence:	Well-developed (*n* = 4, 100%)
	Well-developed (*n* = 1, 25%)		
Trimester:	First (*n* = 3, 75%)	Delivery:	C-Section (*n* = 3, 75%)
	Second (*n* = 1, 25%)		Forceps (*n* = 1, 25%)
		Child Sex:	Male (*n* = 3, 75%)
			Female (*n* = 1, 25%)

The Story of Pakistani Men Becoming Fathers for the First Time

Being a Pakistani citizen, I (Principal Investigator) tried to explore the experiences of men becoming a father for the first-time in Pakistan. A total of eight first-time Pakistani fathers participated in the study. Four of them belonged to the prenatal phase, and the other four of them belonged to the postnatal phase. Below is the story of their journey of becoming fathers, during prenatal and postnatal periods.

Story of Prenatal Fathers

All four fathers during the prenatal period experienced excitement and joy on receiving the news of their wife's pregnancy. They all were very happy about going to be the father for the first time. PR-01 was on cloud nine for getting married with his love-interest and being able to

have a baby. He believes that his wife's love and affection for him will increase once his baby is born. He also believes that the more children he produces, the more blessings he will have from Almighty. He learnt these beliefs from his religious-minded friends and religious gatherings. PR-02 was cheering because his parents would be able to have their grandchild. For him, marriage and procreation are important aspects of life. He believes that Allah has created this system for running this world's business as he stated, "This is how the world works and Allah has kept this system in place". PR-03 was excited for having a new addition in his family. He believes that a child gives a purpose to a man's life. PR-04 was happy on extension of his generation and he considers children as a blessing from Allah. He felt sad about loneliness of childless couples as he said, "They get older and still are lonely without children".

All men observed significant changes in their wives' attitude and temperament during pregnancy. Their wives had frequent mood swings and became irritated and angry over every minute matter, but husbands exercised patience during that time. Because they had observed in their families and friends, and had learnt from doctors, social media, TV, dramas, movies, and society that reacting angrily to a pregnant woman negatively affects the baby's health. They also believed that women are less intelligent and can hurt themselves if they disputed with them as PR-02 pointed out, "Women are little unwise. God forbid if she tries to harm herself after I hit her, that would be something I fear".

Men used different methods to manage their reaction and stress when their wives drove them mad. Either they left their rooms when their wives were gushing in anger or went to their other family members or friends to distract themselves from that hot moment. Few men visited mosques to get Allah's help for controlling their anger because they learnt that anger comes from the devil. So, they prayed in the mosque to take Allah's refuge from the devil. Also, they

believed that only Allah could solve their problems, so they referred to HIM during times of trials and tribulations.

All men were worried about their rising financial expenses during the pregnancy. These expenses included doctor's consultations charges, laboratory tests, and provision of healthy food to their wives, along with paying for their house rent and daily household expenses. During that time, either they themselves tried to curtail their daily utility expenses, or their family members or friends or in-laws extended financial support to them. Their belief about Allah's help for sustaining the new life consoled them during that troubled time. None of them shared any concern with their pregnant wives as they did not want their wives to take on any stress during pregnancy. Because they had learnt through various resources (family, friends, media) that taking on stress during pregnancy can negatively affect both the mother and child's health.

All men preferred to take guidance either form their family members or another wise, knowledgeable, trustworthy men. For medical related issues, they preferred to discuss these either with doctors or nurses. None of them preferred to share their wife's matters with their friends or colleagues because of two main reasons. Firstly, they had observed their friend's making mockery if such matters were shared with them. Secondly, they had learnt that their religion does not allow them to discuss their wife's matters with their friends. So, all men followed their religious teachings and acted accordingly.

All fathers planned to nurture their child in a good environment. To them, a good environment means training their child to be respectful with their elders. They believed that the outside environment affects a child's behavior more than the inside environment of the home. They witnessed children being spoiled by the outside environment. They were very thoughtful about their child's good image in front of their family members and friends. So, they were giving

more importance to the moral upbringing of their child. Regarding the destiny of his child, PR-02 believed that it is pre-destined by the Almighty what profession the child will be part of in the future. Hence, it will be going against HIS will if he pre-decides for his child.

Story of Postnatal Fathers

Postnatal fathers had different experiences during labor and delivery phase, and in the postnatal period. All the fathers except one were worried and fearful during labor and delivery phases of their wife's pregnancy. For induction of labor, the wife of PP-01 was given artificial pains. She remained in pain for the whole night. PP-01 and PP-02 felt that it was challenging to see their wives in pain, and they were stressed out. PP-01 was frightened by recalling the cases of other pregnant ladies among their relatives and in movies who were also distressed during labor and delivery. PP-01 expressed his feelings for that time as, "There was a lot of stress at that time. I did not cry yet I felt stressed, and my hands and legs were shivering. It is like experiencing death from close".

PP-03 has mixed feelings as he was excited to receive his baby and panicked, simultaneously. A state of emergency occurred during the birthing process. His son could not breathe fifteen minutes prior to the delivery. So, it was a mixed emotional experience for him. However, PP-04 remained calm during labor and delivery phase. The doctor had recommended him and his wife a C-Section prior to the delivery because his child's position was not feasible for the normal delivery. So, his emotions were stable during the delivery time.

Despite being apprehensive and anxious at the time of delivery, fathers depicted themselves as being tough and strong, and concealed their apprehension and worries for supporting their wives as PP-02 verbalized. "I was tense. My wife was induced. So, she was in a

lot of pain. When I used to go to her, I had to be strong to be able to support her morally. If I had shown some weakness, she would have felt low too".

During that difficult time of labor and delivery, parents and siblings of the fathers were with them in the hospital. However, the hospitals' policies of not allowing husbands in the labor and delivery room, not timely communicating to them about the situation of their wives and baby, asking them to sign on the Consent Form, and requiring them to take full responsibility of the outcome made fathers more anxious and apprehensive at that time. PP-01 verbalized as, "We knew that the mother [pregnant lady] is inside [Labor Room], and the child will be delivered but we did not know what the situation was". Similarly, PP-02 revealed, "After inducing my wife, the doctor called me several hours later and gave me a Consent Form where my signatures were required. The Form mentioned that during this operation, if God forbid something adverse happens, neither the doctor nor the hospital will be held accountable. For me, this was quite challenging as I had to sign on behalf of my wife". Likewise, PP-03 shared, "I came to know a bit late about the complication. Her designated doctor requested that I stay outside… I learned the situation after it had passed… Generally, they have a doctor on the rounds and an allocated nurse. But I saw several doctors entering the room, which worried me. Even though I did not witness the entire situation, I observed something troubling".

All fathers took the help of prayers and performed good deeds (charity) during the difficult times as they had learnt this from their families since their childhood. PP-02 confirmed as, "I would say that the family's background matters in this aspect… Whenever we start a task, we usually begin it with 'Bismillah Hi Rahman Ar Raheem' (In the name of Allah, the most Gracious, the most Merciful) or whichever religion we practice. I did the same, which was a part of my upbringing and that supported me as well". He further elaborated, "I kept such (stress)

emotions inside me. At times when we feel stuck, we pray to Allah, and we start doing good deeds. I did the same things and prayed so that I could be helped by nature and kept myself strong because I could only support her when I was strong".

All fathers were immensely happy on receiving their baby as the addition of a new member had extended and united their family. All of them had distributed sweets to hospital staff and their relatives. After the delivery of a child, working fathers faced challenging to manage dual responsibilities of office and family as PP-02 said, "If the child is sick, husband will take the wife and child to the hospital… When the child wakes up frequently at night, husband and wife manage together. As husbands, we must go to work in the morning which has no leniency when it comes to the workload. People at work will only be supportive to some extent. They will eventually ask us to be productive as they are paying us". In a joint-family system, they also had to take care of their parents. To manage their dual (home and office) responsibilities effectively, they made some compromises such as cutting down on their hobbies and socializing with friends.

All men experienced a sense of responsibility after the delivery of their child. After delivery, PP-02 and PP-03 felt the instinct to take responsibility of their child as PP-02 explained, "This is a cycle that goes on. Just like he [his father] played a role for his child, I now must do the same… This is a natural trait that comes from Allah that we tend to help our children". PP-04's love for his child was also natural but he acknowledged that he had expectations also from his child as he declared, "We expect our children to help us. Today we are entertaining and supporting them [child] so tomorrow they [child] will do the same, because the government does not support us in our country. So, we rely on our children". He continued,

“This baby is my child and my property, and I am investing in it [child]. You must be responsible for it [child] so in the future he can take responsibility [for us] when he grows up”.

All fathers had to adjust their sleeping routine at night, to take care of their child who used to remain awake late at night. All of them were supportive to their wives and learnt new skills for helping their wives such as changing baby’s diapers, burping the baby after feeding, putting the baby to sleep, bathing the baby, holding the baby’s head properly, soothing the crying baby, etc. Families of all the couples were also supportive of them. The parents of the men guided them about prevailing norms in the society such as keeping the pregnant woman indoors during a lunar eclipse; consuming Semolina for gaining strength after delivering a baby; rituals, and processing for naming a child; and taking decision for C-Section. However, men did not require emotional support from anyone except getting assistance in performing daily chores as PP-04 asserted, “I do not need any emotional support because I am quite intelligent emotionally. In today’s time, it is enough if they are helping me with chores”.

Few of the postnatal fathers experienced their wife’s agitation and anger after giving birth to a baby. But they were considerate and understood that this is normal for a postnatal mother, so they remained composed and peaceful. PP-01 accepted that both husband and wife experience postnatal depression which results in having fights between them. But he believes that a man should be mentally strong and give importance to his wife’s depression rather than his own because he considers a man as a ‘captain of the ship’.

Fathers emphasized discipling their children and teaching them manners. They believed that giving education to children is necessary but teaching them proper behavior is of equal importance so that their children can have their own identity with impressive personality. Fathers also highlighted the importance of planning for the future as PP-02 expressed, “Planning is

extremely important. If you look at Pakistan's economic condition, it has certainly become very challenging. Upbringing, medical, and education have gotten expensive. Not only should you plan financially but also manage your time as to how much input you can give. Both these things matter… If you think you can plan accordingly then go for it [having children] otherwise wait for the right time".

Discussion

The study aimed to investigate the experiences of men becoming first-time fathers in Pakistan, and to explore about the function and association of structure and agency in producing the causal mechanism(s) behind these experiences. The results of this study are categorized in two groups: (1) prenatal period, and (2) postnatal period up to six-months. The correlation between structure and agency will be further described by using the SEM framework. This will help in creating the hypothesis about causal mechanism(s) responsible for generating experiences and events for men becoming fathers for the first time in the context of Pakistan.

Prenatal Period

During prenatal period, the complex interplay occurring among the agencies was evident in the results mentioned earlier. For example, the interconnectivity and relationship of participants with their parents' expectations; knowledge received from parents, wisemen, doctors, nurses, friends, and religious people; desire for receiving more love from wife and blessings from Almighty; and individual's value for living a meaningful life became the reasons behind first-time fathers going through their prenatal experiences in Pakistan. Similarly, the multifaceted interactions taking place between agency and structure (the terms 'agency' and 'structure' originated from the philosophy of CR), for instance; societal norms for extending

generations, religion (gatherings and teachings), social loneliness, and various systems (world system, societal system, and Allah's system); were the cause which brought prenatal experiences to the first-time fathers in Pakistan.

If the prenatal experiences of first-time Pakistani fathers are analyzed thoroughly, all reasons underlying their experiences will be categorized under one or more layers of the SEM framework. Such as, an individual's value of having purpose falls under the SEM layer of 'Individual'; desire for having the increased affection of their wife falls under the SEM layer of 'Relationship'; teachings received at the religious settings falls under the SEM layer of 'Community'; and societal norms and systems falls under the SEM layer of 'Societal'. Hence, as a part of the CR process, it is hypothesized that the influence of all four levels of the SEM framework (i.e., Individual, Relationship, Community, and Societal) were the basis of the experiences of first-time fathers in Pakistan during the prenatal period of their wife's pregnancy; and the causal mechanism for generating this hypothesis is situated in the context of Pakistan and Pakistani society.

Postnatal Period

During labor, delivery, and postdelivery phases (termed here collectively as 'postnatal period'); the interplay manifested among the agencies in the above stated results such as love and affection of fathers for their wives and babies, father's sense of responsibility, expectation of fathers from their baby when they grew up, female's reproductive physiology of going through labor pain, and respiratory physiology of the newborn baby, making compromises and adjustments, learning new skills; became the reasons for fathers for experiencing postnatal period for the first time in the context of Pakistan. Similarly, the interplay of medical agency

(i.e., doctor) with the agency's characteristic of having proper and timely communication with members of a couple assisted couples to remain calm during the birthing process of their baby. Likewise, interactions taking place between the agency and structure made fathers anxious and peaceful during postnatal period e.g., relatives, movies, religion and religious teachings, societal expectation of men showing strength during challenging times, societal norm of positioning men as a head of their families, religion (prayers and good deeds), family (support and guidance), family system, office work, provision of information (timely, accurate, and late), medical condition for labor induction, hospital's rule of getting Consent Form signed by the husband of the pregnant woman, hospital policy of not allowing husbands in the labor and delivery room, medical rule for deciding about C-Section prior in case of abnormal fetal position in the womb, lack of effective government policy to support parents in old age, and economic conditions of the country.

The careful analysis of the above results reveals that all reasons for first-time fathers for being worried, frightened, and calm during the postnatal period in the context of Pakistan fell under one or more layers of the SEM framework. For instance; fathers' expectation from their child, an individual's biological / physiological characteristics and communication style falls under the SEM layer of 'Individual'; having love and affection for family and receiving guidance from them falls under the SEM layer of 'Relationship'; office workload and responsibilities, and religion, religious settings, and religious teachings fall under the SEM layer of 'Community', and societal norms, government policies, economic conditions, hospital policies, and medical rules fall under the SEM layer of 'Societal'. Therefore, as a part of the CR process, it is hypothesized that the impact of all four layers (i.e., Individual, Relationship, Community, and Societal) of the SEM framework is responsible for making first-time fathers distressed or stress-free during the

postnatal period of their wives. The causal mechanism for this hypothesis is based in the context of Pakistan and Pakistani society.

Results Interpretation

Pakistan is an Islamic state where more than 96% of the population follows the religion of Islam (Demographics of Pakistan, 2024). Despite being one of the Muslim majority countries, the results of the study are not comparable to Pakistani Muslim fathers living in Europe or other Western countries. The reason behind this is situated in the context of Pakistan where its Muslims living there consider procreation a noble cause for receiving rewards from the Almighty Allah in hereafter; despite high taxes, inflation, and having no or low support from the government for running their households. Yet, in order to be culturally adaptable and acceptable; the same population migrating to European or Western countries may not keep producing babies despite receiving education, healthcare, and childcare support from the government. The cultural norms of a society play a vital role in the way people conduct their lives. In this regard, it is important to involve faith-based leaders in sensitizing people and bringing healthcare reforms about screening of fathers' mental health during the perinatal period of their wives, in Pakistan.

Limitation and Strength

The limitation of this study includes the absence of purposive sampling. First-time fathers having diversified sociodemographic characteristics and belonging to all trimesters of the pregnancy could have been included to maximize variation in the study. The maximization of the variation could have led to exploration of different experiences of first-time fathers in Pakistan. The strength of this study is that it is the first study in the context of Pakistan in which the experiences of men becoming first-time fathers have been explored with the intent to identify

and understand the causal mechanism(s) responsible for generating these experiences and event, under the philosophy of CR. The novelty of this study is the integration of CR philosophy with the framework of SEM to propose the hypothesis of the identified causal mechanism(s), in the context of Pakistan.

Study Implications

The results of this study have implications for supporting first-time fathers in Pakistan during this life transition at all levels of the SEM framework. For example, on the 'Individual' level, fathers need to be educated prior to the birthing process and hospitals' policies in this regard. On the 'Relationship' level, couples and their immediate family members need to discuss the husband's legal authority for deciding on their wife's behalf in case any medical emergency occurs. On the 'Community' level, reproductive health education should be included in secular and religious school curriculums. Mental health challenges faced by the fathers during the perinatal period should also be included in the curriculums of healthcare professionals' training programs. Healthcare professionals should be trained to identify those fathers who are at risk of developing psychological distress during the perinatal period of their wife's pregnancy. Healthcare practitioners should be equipped with necessary skills and knowledge for managing perinatal psychological distress in fathers. On the 'Societal' level, the public needs to be sensitized towards perinatal mental health challenges faced by fathers through mass communication and several media platforms. Hospitals' administrators and healthcare policymakers should be educated and encouraged to bring reforms to the existing healthcare service delivery system.

Conclusion

The integration of CR philosophy and SEM provides a solid foundation for assisting first-time fathers during the perinatal period of their wives especially in the context of Pakistan by understanding and exploring the causal mechanism(s) behind the experiences of fathers on every level of the SEM framework. It is recommended that for future studies, mixed-method research should be conducted for investigating the understudied phenomena with various lenses which will help researchers to advocate for policy reforms on national and international levels. The results of this study will help practitioners to bring reforms in the existing health-sciences and social-sciences curriculum for sensitizing and equipping future leaders about the men's experiences and their underlying causes that influence their health and the health of their family as they become fathers for the first-time. The study will also facilitate practitioners and healthcare administrators to integrate fathers' mental health in the existing healthcare system including actions such as assigning nursing staff to evaluate fathers' mental health during antenatal and postnatal visits of the mothers in the clinics, community settings, and hospitals. In this way, it is anticipated that this baseline study done by the PI will pave the ground for bringing contextual healthcare reforms for supporting first-time fathers during perinatal period in Pakistan. These efforts have the potential to improve the physical and mental health and wellbeing of these fathers, their families, communities, and Pakistani society.

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Transition to Chapter Five (Integrated Discussion)

This last chapter provides an integrated discussion about the results of the phase-one study (scoping review - manuscript one) and phase-two study (qualitative descriptive research - manuscript three). Four steps have been used for writing the Integrated Discussion chapter. These steps include overall summarization, main discussion points, strengths and limitations, and integrative implications.

Step-one summarizes the overall purpose of this thesis along with the main results of each phase of the thesis (scoping review and qualitative research). The overall purpose of this thesis was to understand and seek out the explanations for the subjective experiences of first-time fathers during the perinatal period in the context of Pakistan, with the intention of using this knowledge to inform practice. However, because of the feasibility of conducting doctoral research without funding, the first two phases (scoping review, and qualitative descriptive research) were conducted for the doctoral thesis.

Step-two includes the main discussion points emerging from each phase of this thesis. The results of both phases of this thesis led to the three main integrated discussion points. These three integrated discussion points were further discussed under the light of the available national, regional, and international relevant literature.

Step-three consists of the strengths and limitations of the entire thesis. The strength of this thesis comes from the integration of CR philosophy and the SEM framework. This integrated framework facilitated the Principal Investigator (PI) in generating hypotheses for causal mechanism(s) at all four levels of the SEM framework in the context of Pakistan. Hence, the identified causal mechanism(s) were responsible for producing perinatal experiences for the

first-time fathers in Pakistan. The study limitation is the small sample size of participants (n = 8) in accordance with CR philosophy which requires in-depth data collection followed by detailed narrative summaries. Inclusion of first-time fathers representing more of the subcultures of the Pakistani society could have generated more diversified causal mechanism(s) responsible for producing perinatal experiences for the first-time fathers in Pakistan.

Step-four includes the implications from each phase of the thesis, especially for the fields of healthcare and nursing. These include implications for practice, implications for education, implications for policy, and implications for research. To conclude, the results of both phases (scoping review and qualitative descriptive research) of this thesis confirmed the potential presence of PPPD in first-time Pakistani fathers and that the risk factors contributing to the development of PPPD in first-time Pakistani fathers had their origins in the four levels of the SEM framework.

Chapter Five

Integrated Discussion

This chapter includes an integrated discussion of the results that have been presented in this thesis. In this chapter, I use the four step approach for writing an integrated discussion (Lewis et al., 2021). Step-I is a summary of the overall purpose of this thesis. Key results from each part of the study will be reported in this step. Step-II will include the main discussion points emerging from results of the individual parts of the study. The identified integrated discussion points will be discussed under the light of available national, regional, and international relevant literature. In Step-III, the strengths and limitations of the entire thesis will be shared. Implications of the individual studies will be stated in Step-IV that will lead to the implications for the complete thesis in the field of healthcare and nursing. Lastly, the chapter will be concluded by highlighting the comprehensive contributions made by the thesis results about mental health of the men becoming first-time fathers during their wife's perinatal period. The scheme for this chapter is presented in Table 1.

Table 1

Steps and Included Content for Writing Integrated Discussion Chapter

Steps	Included Content
Step-1	Summary of overall thesis purpose and main results from each study.
Step-II	Main discussion points and relevant literature.
Step-III	Strengths and limitations of the entire thesis.
Step-IV	Implications of each study leading to the implications for the entire thesis.

Step-I: Summarization of the Study's Parts

Initially, the thesis was planned to be a mixed-method study including three phases i.e., (1) scoping review study phase, (2) formative-qualitative descriptive study phase, and (3) quantitative study for instrument development and validation phase. This series of three studies was planned to address the following research questions: (1) what evidence is available about factors contributing to paternal perinatal psychological distress in first-time fathers? (2a) what are the experiences of men becoming first-time fathers in Pakistan? (2b) what are the causal mechanism(s) behind these experiences? and (3) what are the validated gender-specific risk factors for developing perinatal psychological distress in first-time fathers in the context of Pakistan? The overall purposes of this thesis were to understand the subjective experiences of men becoming first-time fathers in Pakistan and I intended to use this knowledge to inform practice. However, because of the feasibility of conducting doctoral research without funding, the first two phases of the study were completed as this doctoral thesis. The third phase of this research program is planned to be conducted as a postdoctoral fellowship in the future. The study aims, study design, and key results presented below are from the first two phases of this emerging research program.

Phase-I: Scoping Review Study

The first phase of the research program was a scoping review study titled, "First-Time Fathers Risk Factors of Paternal Perinatal Psychological Distress: A Scoping Review" (Chapter 2; Zindani et al., 2023). The purpose of conducting this scoping review was to examine the literature about risk factors contributing to the paternal perinatal psychological distress in first-time fathers. The results of this scoping review showed that only 16 studies were conducted

about contributing risk factors for developing PPPD in first-time fathers. Overall, the included studies had used 56 distinct tools to measure these risk factors. The tools had lacked the gender sensitivity. The symptoms included in these tools for measuring PPPD were either normal phenomena (e.g., lack of sleep) experienced during perinatal period or primarily expressed by women (e.g., crying) (Chatmon, 2020; Philpott, 2023). Therefore, the results of these studies were not precise and may not be adequate for assessing the unique needs of men experiencing psychological distress during their wife's perinatal period. There was only one Pakistani father who had participated in these studies (Baldwin et al., 2019). None of the studies had been conducted on perinatal mental health of first-time fathers in the context of Pakistan. Also, the domains of the measuring tools were categorized under the four layers of the SEM framework i.e., Individual, Relationship, Community, and Societal. Hence, the results of this scoping review were used to design the next phase of this thesis which focused on making qualitative descriptive enquiries about the experiences of first-time fathers in Pakistan.

Phase-II: Qualitative Descriptive Research

The second phase of the research program was a formative phase titled "Qualitative Study of Men's Experiences of Becoming a Father for the First-Time in Pakistan: A Critical Realist Perspective" (Chapter 4; Zindani et al., 2023). The two aims of conducting this qualitative study were: (1) to identify the experiences of men becoming first-time fathers in Pakistan, and (2) to uncover clarifications about the causal mechanism(s) underlying these experiences. This study used critical realism (CR) philosophy and the social ecological model (SEM) framework (*Principles of Community Engagement - Second Edition*, 2015; Schiller, 2016). The results of this qualitative descriptive research revealed the involvement of agency and social structures in generating the causal mechanism(s) that were responsible for originating the

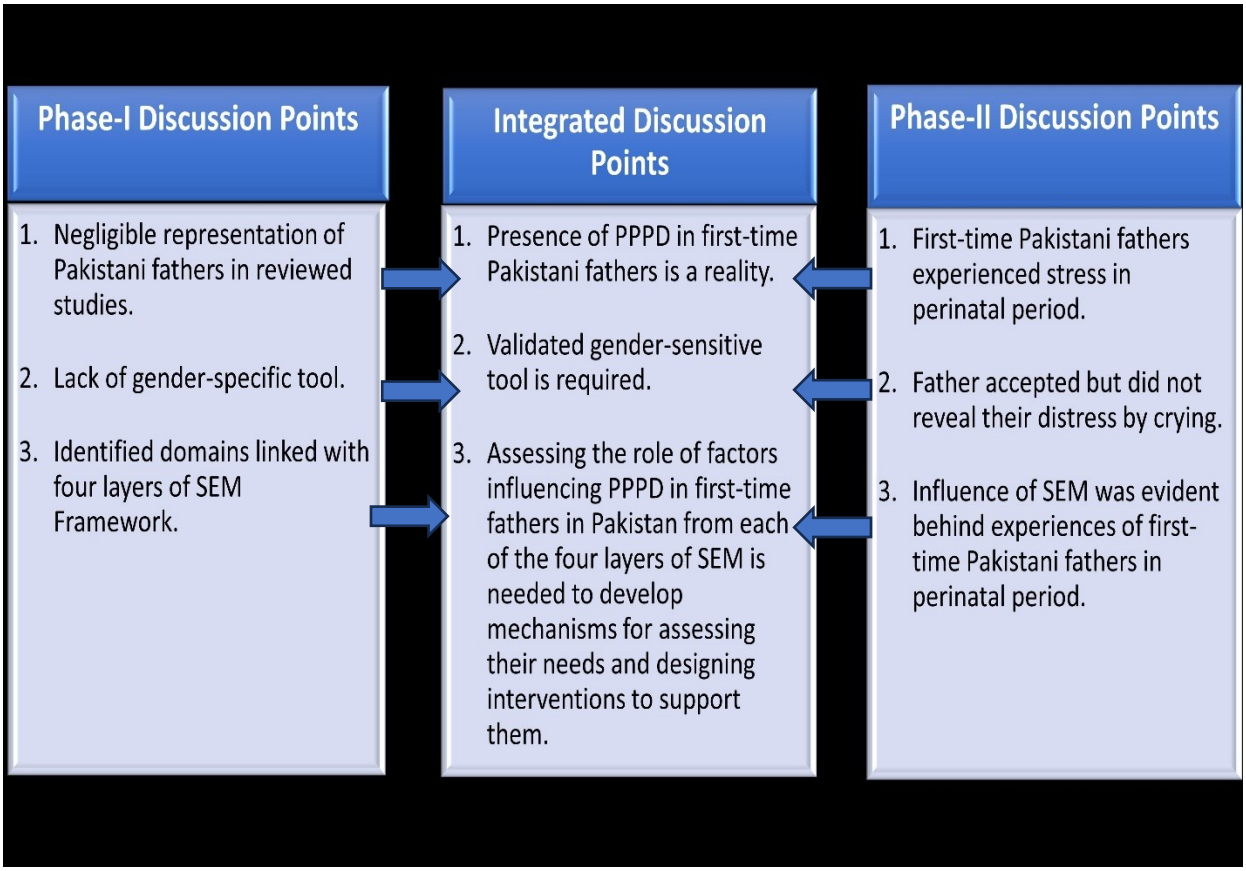
experiences of first-time fathers in the context of Pakistan during the perinatal period of their wives. The study hypothesized and concluded that the interactions among and between agencies and structures were contextual and occurred at all four layers of the SEM framework i.e., Individual, Relationship, Community, and Societal.

Step-II: Main Discussion Points

The results of each study assisted the Principal Investigator (me) in formulating the integrated discussion points for the thesis. A snapshot of the main results of each study with the emerging integrated discussion points is illustrated in Figure 1. The results of each research along with the identified integrated discussion points will be linked with the relevant literature to verify the rigor of these results.

Figure 1

Summary of Each Study's Discussion Points to Identify Integrated Discussion Points



Phase-I: Results of Scoping Review

The scoping review about risk factors contributing to the PPPD in first-time fathers included 16 studies conducted in seven countries (Chapter 2; Zindani et al., 2023). Out of these 16 studies, many of the studies (n = 14) were quantitative in nature. None of the studies were conducted in the South Asian region. Out of 3887 first-time fathers in these 16 studies, only one Pakistani father participated in the study and confirmed the presence of PPPD in him (Baldwin et al., 2019).

A total of 56 instruments were used for assessing the different aspects of psychological distress. These instruments were categorized into 12 domains of risk factors that contributed to

the development of PPPD in first-time fathers. The identified domains (n = 12) were bracketed under the four layers (i.e., Individual, Relationship, Community, and Societal) of the SEM framework.

Out of these 56 tools, only one tool (EPDS) was purposefully developed for measuring postnatal depression, predominantly in mothers. This tool (EPDS) is limited to measuring only depression and that too in the postnatal period only. Another limitation of the existing tools for measuring psychological distress in fathers during the perinatal period belongs to their gender (contextual) irrelevancy such as the inclusion of those depressive symptoms which are mostly expressed by women i.e., sadness and crying.

Phase-II: Results of Qualitative Descriptive Research

The results of the qualitative descriptive research about men's experiences of becoming first-time fathers in Pakistan revealed their experiences of feeling joy, stress, and anxiety during the perinatal period of their wives regardless of their sociodemographic characteristics (Chapter 4; Zindani et al., 2023). Despite experiencing distress, they presented themselves as strong and composed due to the expectations of their loved ones and their societal status being the head of their families. The reasons for their happiness, nervousness, and tension were aligned with the complex interactions occurring between agents and social structures in the context of Pakistan. These interactions produced causal mechanism(s) which originated in each of the four layers (i.e., Individual, Relationship, Community, and Societal) of the SEM framework.

Integrated Discussion with Literature

Although there was only one Pakistani first-time father in the reviewed studies ((Baldwin et al., 2019) (phase-I scoping review research) that confirmed experiencing the paternal psychological distress during perinatal period of their wives, the results of the phase-II qualitative descriptive research validated the presence of perinatal stress and anxiety in first-time fathers in Pakistan. This result is compatible with several other international studies conducted on the subject of paternal perinatal mental health (Antoniou et al., 2021; Azzam et al., 2022; Philpott, 2023).

The available tools for measuring PPPD in first-time fathers lack precision as the gender sensitivity in describing psychological distress has not been accounted for in these tools. For example, inclusion of the depressive symptoms (i.e., sadness and crying) in these tools which are predominantly expressed by women, may make men frightened of being stigmatized as 'weak' in their families and society. Consequently, the absence of a gender-specific tool for measuring PPPD in first-time fathers may have contributed to the non-recognition of PPPD in the DSM-5-TR. This result is parallel with other studies (Chatmon, 2020; Philpott, 2020, 2023).

The results of the phase-I scoping review study revealed that each identified domain (n = 12) was related to one of the four layers (Individual, Relationship, Community, and Societal) of the SEM framework. The phase-II qualitative descriptive research investigated the role of the agency and social structures in generating the causal mechanism(s) for first-time fathers' experiences in the context of Pakistan. For instance, the interactions that occurred between family, friends, wisemen, healthcare professionals, religious scholars, religion teachings, government policies, hospital or medical rules, societal norms and expectations, and workload

were manifested in the way first-time fathers experienced emotions during the perinatal period of their wives in Pakistan. The results of these interactions were interpreted and organized based on the four layers of the SEM framework (individual, relationship, community, and societal). However, the existing tools fall short of measuring the role of SEM layers comprehensively in the development of PPPD in first-time fathers. Sadly, the relevant literature about the role of SEM layers in contributing to the development of PPPD in first-time fathers is challenging to find as to the best of the PI's knowledge, this is the first documented study that is integrating the SEM layers with the research done about PPPD in first-time fathers.

Step-III: Strengths & Limitations

This thesis appears to be the first time that CR philosophy was integrated with the SEM framework. This integration facilitated the PI (me) in generating the hypothesis for the identified causal mechanisms, in the context of Pakistan. The causal mechanisms responsible for producing the experiences and events as experienced by the first-time fathers in Pakistan during the perinatal period were identified, comprehended, and documented by the PI. Hence this is the first study in the context of Pakistan which explored the experiences of first-time Pakistani fathers during the perinatal period of their wives, with the intent to understand the origin of those experiences and events in the light of the 4 layers of the SEM framework. However, the analysis of the primary studies analyzed by the SEM framework and integrating it with the CR philosophy is a time-consuming approach for researchers. The thesis could have been benefited more by including a greater number of participants and doing cross-cultural examination of the subcultures prevailing in the society of Pakistan, which could have been responsible for generating diversified experiences of first-time fathers during perinatal period.

Step-IV: Integrative Implications

Various disciplinary and integrative implications emerged from this thesis including both phases of the study. These implications are discussed in relation to the areas of practice, education, policy, and research.

Implications for Practice

The results of this thesis suggested that first-time fathers experienced PPPD in Pakistan and other countries. However, the existing tools for assessing PPPD in first-time fathers are not gender sensitive nor contextually relevant for Pakistan. These tools include the symptoms of psychological distress (e.g., crying and sadness) that are mostly experienced by women (Chatmon, 2020; Philpott, 2023). Men are reluctant to accept and express these symptoms due to societal pressure, norms, and expectations from them to demonstrate themselves as a strong being; whereas crying and being sad is considered a weakness for men (Chatmon, 2020; Philpott, 2023). Likewise, the other symptoms assessed in these tools are not relevant in the context of the symptoms normally experienced during the perinatal period e.g., fatigue and having inadequate sleep during the perinatal period (Philpott, 2023). If such symptoms are measured by the existing non-contextual and not gender sensitive tools, it may exaggerate the presence of psychological distress in men during the perinatal period. Hence, the development of a gender-specific / contextual tool will help healthcare practitioners to precisely recognize psychological distress in men during their wife's perinatal period.

The construction of an authenticated gender-sensitive / contextually relevant scale would ensure the inclusion of specific criteria for diagnosing PPPD in diagnostic manuals such as the DSM-5-TR which is currently missing from that manual (Azzam et al., 2022; Bruno et al., 2020;

Chavis, 2022). The intent to incorporate the PPPD in the DSM-5-TR is not to medicalize it, rather to realize its origin based on the four layers (Individual, Relationship, Community, and Societal) of SEM framework (Chapter 2; Zindani et al., 2023). The influence of the four layers of the SEM framework affects the mental health of first-time fathers during the perinatal period in Pakistan. Once this realization is achieved, it will assist healthcare professionals to develop controlling and preventive measures particularly targeting the related layer of the SEM framework.

The development of a validated gender-specific and contextually relevant instrument may support healthcare professionals and administrators in strengthening the existing healthcare system by incorporating the father's mental health in it (Chapter 4; Zindani et al., 2023). For example, men accompanying their wives for their antenatal and postnatal consultations with their doctors can be assessed by the nurses for the presence of PPPD symptoms along with its associated risk factors with the help of a precise gender-specific and contextual instrument. Similarly, nurses or midwives visiting mothers during antenatal and postnatal periods in community settings can also benefit by using this tool for assessing the incidence of PPPD in fathers.

Implications for Education

The results of this thesis imply reform in the existing curriculum for nursing education. Healthcare seekers first encounter with the nurses at both hospital and community settings, and they remain in contact with nurses for an extended period (Turale & Kunaviktikul, 2019). Therefore, nurses are well positioned to comprehend and investigate the health status of first-time fathers, and work together with them, to identify and document the origins of factors that

affect their health during the perinatal period. Hence, to study in detail and to promote the mental health of the first-time fathers during the perinatal period, it is essential for nurses to have thorough knowledge about the existence of PPPD in men. For this reason, PPPD should be added to the nursing education curriculum in the subject of Psychology. Eventually, the study of PPPD will serve future nurses and healthcare leaders to recognize the presence of psychological distress in fathers during the perinatal period. It will also aid in their understanding of the risk factors along with the causes that can potentially contribute to the development of PPPD in first-time fathers. Once sensitized with this knowledge, nurses will be better prepared to help first-time fathers during this phase of their lives.

Implications for Policy

The results of this thesis recommend policy reforms on national and international levels not only for promoting the mental wellbeing of the first-time fathers but for accomplishing the maternal health and child health targets of the Sustainable Development Goal 3 (SDG-3) (The 17 Goals - Sustainable Development, n.d.). In this regard, nurses can play a vital role for policy advocacy and reforms as advocacy is a central element of the nursing process (Anders, 2020). Nurses also receive comprehensive knowledge regarding health issues faced by the individuals and communities which helps them to advocate for healthcare policy reforms (Turale & Kunaviktikul, 2019). Also being greater in number nationally and internationally, nurses can exercise influential power in bringing healthcare policy reforms on global and local levels for promoting first-time fathers' mental health during their wife's perinatal period.

As a nurse, researcher, and advocator; the results of this thesis and subsequent related studies will empower me to propose healthcare policy reforms for the inclusion of perinatal

mental health of the first-time fathers in the agendas of the provincial health ministry (PHM), federal health ministry (FHM), non-governmental organizations (NGOs), South Asian Association for Regional Cooperation (SAARC), SDG-3, and the upcoming World Health Organization's (WHO) Mental Health Action Plan.

Implications for Research

The results of this thesis may lead to future studies of PPPD in first-time fathers. Currently, most reported studies are quantitative in nature. However, mixed-method and multi-method studies will enable researchers to investigate PPPD in multiple dimensions. Grounded Theory research will help researchers in developing a theory about PPPD in first-time fathers. Ethnography researchers will be able to study the behaviors of the first-time fathers during the perinatal period, in relation to the specific cultures of first-time fathers.

As discussed above, the results of this thesis will direct researchers to a gender-sensitive instrument development and validation study in the future. The construction of a gender-specific instrument will also help researchers in performing cross-cultural examination and understanding of the factors contributing to PPPD in first-time fathers. Randomized Controlled Trials (RCTs) are taken as a 'gold standard' for conducting interventional studies. But largely, it is unfeasible for researchers to control the environment of the participants (first-time fathers during perinatal period) strictly for the studies aiming to investigate the role of social structures affecting their health status. In this context, quasi-experimental studies would be more practical to conduct.

Conclusion

The results of this thesis including both phases of the study produce new knowledge revolving around paternal perinatal mental health of first-time fathers, especially in the context of Pakistan. Both phases of this thesis confirmed first-time fathers' experiences of psychological distress during the perinatal period of their wives. The risk factors contributed to their experiences had their origins in the four layers of the SEM framework. The use of CR philosophy facilitated the understanding of the underlying causal mechanism(s) beneath those experiences and events. The novel approach of amalgamating CR philosophy and SEM framework signifies the formation of deeper understanding generated by this thesis about the mental health challenges faced by the first-time fathers during perinatal period in the context of Pakistan. It is anticipated that the knowledge generated by this thesis can help policymakers in developing context specific and non-medicalized interventions for first-time fathers across the four layers of the SEM framework. For example, inclusion of reproductive health education in secular, religious, and healthcare professionals' curriculums; media campaigns for sensitizing people about the potential mental health challenges faced by fathers during the perinatal period; and inclusion of fathers' mental health assessment in the existing perinatal healthcare service delivery structure. Collectively these measures will result in improving the quality of life of fathers and their families, which can also have a positive impact on the efforts being made for bringing down the maternal morbidity and mortality rates, especially in Pakistan.

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Appendix A

Certificate of Ethics Approval

01/08/2023

Université d'Ottawa
Bureau d'éthique et d'intégrité de la recherche

University of Ottawa
Office of Research Ethics and Integrity

CERTIFICAT D'APPROBATION ÉTHIQUE | CERTIFICATE OF ETHICS APPROVAL

Numéro du dossier / Ethics File Number	H-02-23-8846
Titre du projet / Project Title	Critical Realist Perspective about Pakistani Men Becoming a Father for the First-time: A Multi Method Study
Type de projet / Project Type	Thèse de doctorat / Doctoral thesis
Statut du projet / Project Status	Approuvé / Approved
Date d'approbation (jj/mm/aaaa) / Approval Date (dd/mm/yyyy)	01/08/2023
Date d'expiration (jj/mm/aaaa) / Expiry Date (dd/mm/yyyy)	31/07/2024

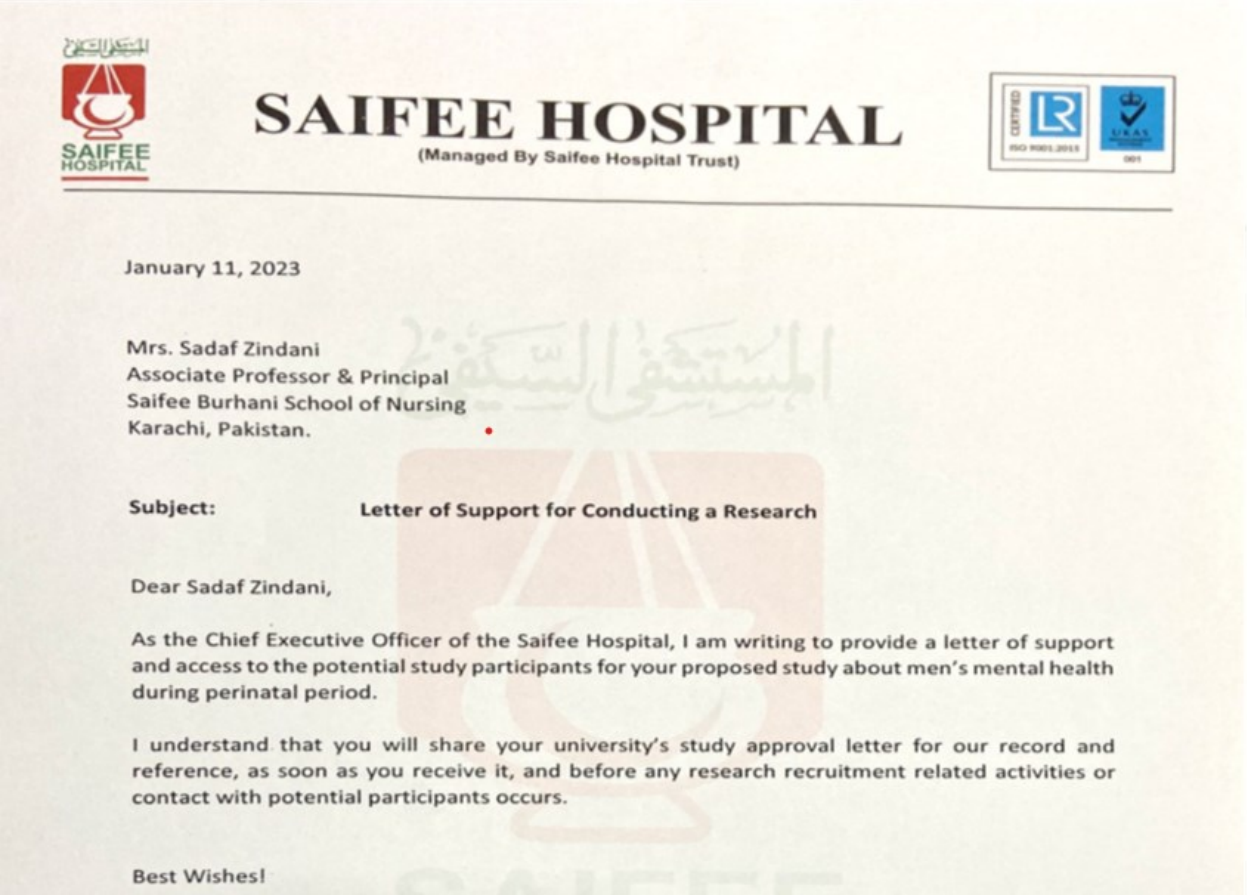
Équipe de recherche / Research Team

Chercheur / Researcher	Affiliation	Role
Sadaf ZINDANI	École des sciences infirmières / School of Nursing	Chercheur Principal / Principal Investigator
J. Craig PHILLIPS	École des sciences infirmières / School of Nursing	Superviseur / Supervisor

Conditions spéciales ou commentaires / Special conditions or comments

Appendix B

Letter of Support



SAIFEE HOSPITAL

(Managed By Saifee Hospital Trust)

January 11, 2023

Mrs. Sadaf Zindani
Associate Professor & Principal
Saifee Burhani School of Nursing
Karachi, Pakistan.

Subject: **Letter of Support for Conducting a Research**

Dear Sadaf Zindani,

As the Chief Executive Officer of the Saifee Hospital, I am writing to provide a letter of support and access to the potential study participants for your proposed study about men's mental health during perinatal period.

I understand that you will share your university's study approval letter for our record and reference, as soon as you receive it, and before any research recruitment related activities or contact with potential participants occurs.

Best Wishes!

Appendix C

Recruitment Advertisement for Male Research Associates (RAs)

Recruitment Advertisement for Male Research Associates (RAs)

We need two male Research Associates for a qualitative study on exploring the men's experiences during perinatal period. Interested candidates are required to email their CVs along with the Statement of Purpose. The shortlisted candidates will be invited for the interview.

The selected candidates will be trained for the data collection and data transcription processes, and will be compensated monetarily for their time and efforts. The compensation is PKR 1000/- per Research Associate for training session, and PKR 1000/- per Research Associate, per interview.

Appendix D

Confidentiality Agreement to be signed by all Research Assistants

Confidentiality Agreement to be signed by all Research Assistants

Title: Qualitative Study of Men's Experiences of Becoming a Father for the First-time

Principal Investigator: Sadaf Zindani

I, _____, am participating in the above-referenced project (Qualitative Study of Men's Experiences of Becoming a Father for the First-time) in the capacity of Research Assistant and will have access to data collected during the course of the Project. I hereby agree:

1. To keep all information shared with me (Confidential Information) strictly confidential. I further agree not to reveal any such Confidential Information to any other person, firm, corporation, company or other entity unless specifically authorized to do so in writing by the Principal Investigator of the Project.

2. To use the Confidential Information only for the purposes of the Project and not for any other purpose unless authorized to do so in writing by the Principal Investigator.

3. To return all Confidential Information provided to me in any form to the Principal Investigator when I have completed my tasks. If the Confidential Information is not returnable, I will erase or destroy any such Confidential Information, including, without limitation, information stored on a computer hard drive or on a USB data storage device, and will confirm in writing its erasure or destruction to the Principal Investigator.

4. These obligations of confidentiality will continue after my participation in the Project has ended.

_____ _____

Research Assistant (date)

_____ _____

(Principal Investigator) (date)

Appendix E

Confidentiality Agreement to be signed by all CAB Members

Confidentiality Agreement to be signed by all CAB Members

Title: Qualitative Study of Men's Experiences of Becoming a Father for the First-time

Principal Investigator: Sadaf Zindani

I, _____, am participating in the above-referenced project (Qualitative Study of Men's Experiences of Becoming a Father for the First-time) in the capacity of a Community Advisory Board (CAB) Member and will have access to the Meeting Minutes, Training Session, Recruitment Text, Consent Form, Interview Guide, Biodata Form, and the data collected during the course of the Project. I hereby agree:

1. To keep all information shared with me (Confidential Information) strictly confidential. I further agree not to reveal any such Confidential Information to any other person, firm, corporation, company or other entity unless specifically authorized to do so in writing by the Principal Investigator of the Project.

2. To use the Confidential Information only for the purposes of the Project and not for any other purpose unless authorized to do so in writing by the Principal Investigator.

3. To return all Confidential Information provided to me in any form to the Principal Investigator when I have completed my tasks. If the Confidential Information is not returnable, I will erase or destroy any such Confidential Information, including, without limitation, information stored on a computer hard drive or on a USB data storage device, and will confirm in writing its erasure or destruction to the Principal Investigator.

4. These obligations of confidentiality will continue after my participation in the Project has ended.

_____ _____

Member, Community Advisory Board (CAB) (date)

_____ _____

(Principal Investigator) (date)

Appendix F

Consent Form

uOttawa

Université d'Ottawa
Faculté des sciences de la santé
École des sciences infirmières

University of Ottawa
Faculty of Health Sciences
School of Nursing

Title of the study: Critical Realist Perspective about Pakistani Men Becoming a Father for the First-time: A Multi Method Study

Name of researcher: Sadaf Zindani, Faculty of Health Sciences – School of Nursing

Name of Supervisor: Professor Dr. J. Craig Phillips, Faculty of Health Sciences – School of Nursing

Invitation to Participate: I am invited to participate in the above-mentioned research study conducted by Sadaf Zindani, a PhD student researcher; under the supervision of Dr. J. Craig Phillips, LLM, PhD, RN, ACRN, FAAN, FCAN, a researcher in the School of Nursing at the University of Ottawa.

Purpose of the Study: The purpose of the study is to explore the causal mechanisms behind the experiences of men becoming a father for the first-time in Pakistan.

Participation: My participation will consist of giving one interview of about 60 to 90 minutes at the hospital or my home, as per my feasible place, date, and time. If I become eligible to participate in the study, I will be asked to share information about my age or date of birth, ethnicity, religion, residential address, income range, education level, occupation, designation, experience during my wife's pregnancy and postnatal period; reasons behind those experiences; expressions during my wife's pregnancy and postnatal period; and reasons behind those expressions. My interview will be audio-recorded. I can be asked for clarification, if needed. After analyzing the data, study findings will be shared with me for verification and validation purposes. For this reason, a means of communication will be established by sharing my email address and contact number.

☎ 613 562-5473
613 562-5443
451 Smyth
Ottawa ON K1H 8M5 Canada
www.uOttawa.ca

Risks: My participation in this study should pose few or no risks to me. However, I may experience some feelings of anxiety by discussing my experiences and expectations about becoming or being a first-time father. To mitigate the effects of mental distress,

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de la santé

École des sciences
infirmières

University of Ottawa
Faculty of Health
Sciences

School of Nursing

I will be provided with a list of mental health resources for consultation. Also, I understand there is a referral system, and I will be referred to the general health practitioner at the hospital, if I wish to consult the doctor. And I will be encouraged to visit my local faith-healers also.

Benefits: I understand that there may be no direct benefit to me from participating in this study. My participation in this study will help generate knowledge regarding the causes underlying the experiences of becoming a first-time father in Pakistan. This knowledge may help healthcare providers and policymakers to develop and implement strategies to support men becoming a first-time father in Pakistan.

Confidentiality and anonymity: I have received assurance from the researcher that the information I will share will remain strictly confidential. I understand that my data will be shared with the research team and community advisory board members without disclosing my identity and for the purpose of analysis only. I understand that the contents will be used only for the purposes described above and that my information will be kept password protected and will be stored in the researcher's computer hard drive that will be kept in a locked cabinet. Also, the computer or laptop screen or hard drive will be locked by the researcher when it is not in use. I understand that I can refuse to answer any question without facing any repercussion of my refusal. I also know that I can quit the study at any time. English language translations of my interview transcript will be shared with thesis supervisor Professor J. Craig Phillips, members of the Thesis Advisory Committee, and members of the Community Advisory Board for analysis purposes. I understand that my transcripts sharing via email, will be password protected and the researcher will communicate the password with me via making a call on my personal number.

Anonymity My name or my identity will not be disclosed during interview, and after interview, I will be assigned a unique identification code number for saving my information for analysis purposes. I understand that the information shared by me will be accessed by the research team only, and only the analysis will be shared beyond the research team and without disclosing my identity. My identity will not be revealed during sharing of the study findings in publications or other scholarly works such as policy briefs or lay person summaries.

Conservation of data: Only the research team will have access to my recorded interview and its recording will be kept saved in the PI's cabinet with lock and key and in the PI's hard drive, which will be kept locked in the cabinet.

Compensation: No compensation will be offered.

☎ 613 562-5473
613 562-5443

451 Smyth
Ottawa ON K1H 8M5 Canada

www.uOttawa.ca

Voluntary Participation: I am under no obligation to participate and if I choose to participate, I can withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences in terms of the healthcare and treatment that me, my wife and my child are receiving and will be receiving at the hospital and from the hospital staff.

If I choose to withdraw, all my data gathered until the time of withdrawal will be discarded and not used for data analysis or any further study related activities.

Acceptance: I, _____, agree to participate in the above research study conducted by Sadaf Zindani of the School of Nursing, Faculty of Health Sciences, University of Ottawa, under the supervision of Professor J. Craig Phillips.

If I have any questions about the study, I may contact the researcher or her supervisor.

If I have any questions regarding the ethical conduct of this study, I may contact the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON K1N 6N5

Tel.: (613) 562-5387

Email: ethics@uottawa.ca

There are two copies of the consent form, one of which is mine to keep.

Participant's signature: Date:

Researcher's signature: Date:

I agree to be contacted in the future to review my interview transcript / causal analysis or to participate in a follow up interview.

Email Address: _____

Telephone Number: _____

Appendix G

Consent Form (Urdu)

uOttawa

Université d'Ottawa
Faculté des sciences de la santé
École des sciences infirmières

University of Ottawa
Faculty of Health Sciences
School of Nursing

رضامندی کا فارم

تحقیق کا عنوان: پاکستانی مردوں کے پہلی بار باپ بننے کے بارے میں تنقیدی حقیقت پسندانہ نقطہ نظر: ایک کثیر طریقہ تحقیق

محقق کا نام: صدف زندہانی، فیکلٹی آف ہیلتھ سائنسز - سکول آف نرسنگ

سپروائزر کا نام: پروفیسر ڈاکٹر جے کریگ فلپس، فیکلٹی آف ہیلتھ سائنسز – سکول آف نرسنگ

شرکت کی دعوت: مجھے پی ایچ ڈی کی طالبہ محقق صدف زندانی کے زیر اہتمام مذکورہ بالا تحقیقی مطالعہ میں شرکت کے لیے مدعو کیا گیا ہے۔ زیر نگرانی، سپروائزر ڈاکٹر جے کریگ فلپس، ایل ایل ایم، پی ایچ ڈی، آر این، اے سی آر این، ایف اے اے این، ایف سی اے این، اوٹاوا یونیورسٹی،اسکول آف نرسنگ۔

تحقیق کا مقصد: تحقیق کا مقصد پاکستان میں مردوں کے پہلی بار باپ بننے کے تجربات کے پیچھے اسباب کو تلاش کرنا ہے۔

شرکت: میری شرکت میری ممکنہ تاریخ اور وقت کے مطابق ہسپتال میں تقریباً 60 سے 90 منٹ تک ایک انٹرویو دینے پر مشتمل ہوگی۔ گر میں تحقیق میں حصہ لینے کا اہل ہو جاتا ہوں، تو مجھ سے اپنی عمر یا تاریخ پیدائش، نسل، مذہب؛ رہائشی پتہ؛ آمدنی کی حد؛ تعلیمی معیار؛ پیشہ، عہدہ،

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451 Smyth
Ottawa ON K1H 8M5 Canada

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میری بیوی کے حمل، پیدائش اور بعد از پیدائش کا تجربہ؛ ان تجربات کے پیچھے وجوہات؛ میری بیوی کے حمل، پیدائش اور بعد از پیدائش کے دوران میرے خیالات؛ ان تاثرات کے پیچھے وجوہات؛ اور رائے جس سے اس وقت میرا تناؤ یا اضطراب کم ہو سکتا تھا، کے بارے میں معلومات شیئر کرنے کو کہا جائے گا۔ میرا انٹرویو آڈیو ریکارڈ کیا جائے گا۔ اگر ضرورت ہو تو متعلقہ ڈیٹا جمع کرنے والا مجھ سے دوبارہ رابطہ کر سکتا ہے اور مجھ سے وضاحت طلب کر سکتا ہے۔ ڈیٹا کا تجزیہ کرنے کے بعد، تحقیقی نتائج میرے ساتھ تصدیق اور توثیق کے مقاصد کے لیے شیئر کیے جائیں گے۔ اس مقصد کے لیے میرا ای میل ایڈریس اور رابطہ نمبر شیئر کیا جائے گا۔

خطرات: اس تحقیق میں میری شرکت سے میرے لیے کچھ یا کوئی خطرہ نہیں ہونا چاہیے۔ تاہم، میں پہلی بار باپ بننے یا بننے کے بارے میں اپنے تجربات اور توقعات کے بارے میں بات کر کے کچھ بے چینی محسوس کر سکتا ہوں۔ ذہنی پریشانی کے اثرات کو کم کرنے کے لیے، مجھے مشاورت کے لیے ذہنی صحت کے وسائل کی فہرست فراہم کی جائے گی۔ اس کے علاوہ، میں سمجھتا ہوں کہ ریفرل سسٹم موجود ہے اور اگر میں ڈاکٹر سے مشورہ کرنا چاہوں تو مجھے ہسپتال کے جنرل ہیلتھ پریکٹیشنر کے پاس بھیجا جائے گا اور مجھے اپنے مقامی عقیدے کے علاج کرنے والوں سے بھی ملنے کی ترغیب دی جائے گی۔

فوائد: میں سمجھتا ہوں کہ اس تحقیق میں حصہ لینے سے مجھے براہ راست کوئی فائدہ نہیں ہو سکتا۔ اس تحقیق میں میری شرکت سے پاکستان میں پہلی بار باپ بننے کے تجربات کی بنیادی وجوہات کے بارے میں علم پیدا کرنے میں مدد ملے گی۔ یہ علم صحت کی دیکھ بھال فراہم کرنے والوں اور پالیسی سازوں کو پاکستان میں پہلی بار باپ بننے والے مردوں کی مدد کرنے کے لیے حکمت عملی تیار کرنے اور ان پر عمل درآمد کرنے میں مدد کر سکتا ہے۔

رازداری اور گمنامی: مجھے محقق کی طرف سے یقین دہانی ملی ہے کہ میں جو معلومات شیئر کروں گا وہ سختی سے خفیہ رہے گی۔ میں سمجھتا ہوں کہ میرا ڈیٹا تحقیقی ٹیم اور کمیونٹی ایڈوائزری بورڈ کے اراکین کے ساتھ میری شناخت ظاہر کیے بغیر اور صرف تجزیہ

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کے مقصد کے لیے شیئر کیا جائے گا۔ میں سمجھتا ہوں کہ مندرجات صرف اوپر بیان کردہ مقصد کے لیے استعمال کیے جائیں گے اور یہ کہ میری معلومات کو محقق کے لیپ ٹاپ میں پاس ورڈ سے محفوظ رکھا جائے گا اور ہارڈ ڈرائیو اور دراز میں مقفل کر دیا جائے گا۔ اس کے علاوہ، کمپیوٹر یا لیپ ٹاپ کی سکرین استعمال میں نہ ہونے پر محقق کے ذریعہ مقفل کر دیا جائے گا۔ میں سمجھتا ہوں کہ میں کسی بھی سوال کا جواب دینے سے انکار کر سکتا ہوں، میرے انکار کے کسی اثر کا سامنا کیے بغیر۔ میں یہ بھی جانتا ہوں کہ میں کسی بھی وقت تحقیق چھوڑ سکتا ہوں۔ میرے انٹرویو ٹرانسکرپٹ کا انگریزی زبان میں ترجمہ تھیسس سپروائزر پروفیسر جے کریگ فلپس، تھیسس ایڈوائزری کمیٹی کے ممبران اور کمیونٹی ایڈوائزری بورڈ کے اراکین کے ساتھ ساتھ تجزیہ کے مقاصد کے لیے شیئر کیا جائے گا۔

گمنامی: انٹرویو کے دوران میرا نام یا میری شناخت ظاہر نہیں کی جائے گی، اور انٹرویو کے بعد، تجزیہ کے مقاصد کے لیے میری معلومات کو محفوظ کرنے کے لیے مجھے ایک منفرد شناختی کوڈ نمبر تفویض کیا جائے گا۔ میں سمجھتا ہوں کہ میرے ذریعہ شیئر کردہ معلومات تک صرف تحقیقی ٹیم ہی رسائی حاصل کرے گی، اور صرف تجزیہ ہی تحقیقی ٹیم سے باہر اور میری شناخت ظاہر کیے بغیر شیئر کیا جائے گا۔ مطالعہ کے نتائج کو اشاعتوں یا دیگر علمی کاموں جیسے کہ پالیسی بریفس یا عام آدمی کے خلاصے میں شیئر کرنے کے دوران میری شناخت ظاہر نہیں کی جائے گی۔

ڈیٹا / معلومات کا تحفظ: میرے ریکارڈ شدہ انٹرویو تک صرف ریسرچ ٹیم کو رسائی حاصل ہوگی اور اس کی ریکارڈنگ کو PI کی دراز میں مقفل کر دیا جائے گا اور PI کے لیپ ٹاپ پر پاس ورڈ کے ساتھ محفوظ رکھا جائے گا اور PI کی ہارڈ ڈرائیو میں، جسے کابینہ میں بند رکھا جائے گا۔

معاوضہ: مجھے اس تحقیق میں حصہ لینے کے لیے کوئی معاوضہ نہیں دیا جائے گا۔

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رضاکارانہ شرکت: میں تحقیق میں حصہ لینے کا ذمہ داری نہیں ہوں اور اگر میں تحقیق میں حصہ لینے کا انتخاب کرتا ہوں، تو میں کسی بھی وقت تحقیق سے دستبردار ہو سکتا ہوں اور/یا کسی بھی سوال کا جواب دینے سے انکار کر سکتا ہوں صحت کی دیکھ بھال کے حوالے سے کسی منفی نتائج کا سامنا کیے بغیر، اور علاج جو علاج مجھے، میری بیوی اور میرے بچے کو ہسپتال میں اور عملے سے مل رہا ہے وہ ملتا رہے گا۔ میں سمجھتا ہوں کہ اس تحقیق کا ہسپتال سے کوئی تعلق نہیں ہے۔ اگر میں تحقیق سے دستبردار ہوتا ہوں، تو دستبرداری کے وقت تک جمع کیا گیا میرا تمام ڈیٹا / معلومات کو ضائع کر دیا جائے گا اور اس ڈیٹا یا معلومات کو تجزیے یا مزید تحقیق کے لیے استعمال نہیں کیا جائے گا۔

قبولیت: میں_____، پروفیسر جے کریگ فلپس کی نگرانی میں، سکول آف نرسنگ، فیکلٹی آف ہیلتھ سائنسز، اوٹاوا یونیورسٹی کی طالب علم، صدف زندانی کے ذریعہ کی گئی مذکورہ تحقیقی میں حصہ لینے کے لیے متفق ہوں۔

اگر مجھے اس تحقیق کے بارے میں کوئی سوال ہو، تو میں محقق یا اس کے سپروائزر سے رابطہ کر سکتا ہوں۔

اگر میرے پاس اس تحقیق کے اخلاقی طرز عمل سے متعلق کوئی سوالات ہیں، تو میں پروٹوکول آفیسر فار ایتھکس ان ریسرچ، یونیورسٹی آف اوٹاوا، تبریٹ ہال، 550 کمبرلینڈ اسٹریٹ، کمرہ 154، اوٹاوا، ON K1N 6N5 سے رابطہ کر سکتا ہوں۔

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ای میل: ethics@uottawa.ca

رضامندی کے فارم کی دو کاپیاں ہیں، جن میں سے ایک میرے پاس ہے۔

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میں اتفاق کرتا ہوں کہ مستقبل میں اپنے انٹرویو کی نقل / کازل تجزیہ کا جائزہ لینے یا فالو اپ انٹرویو میں حصہ لینے کے لیے رابطہ کیا جائے۔

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Appendix H

List of Mental Health Support Services in Karachi, Pakistan

After participating in the study, if you experience any emotional discomfort, you can approach any of the following resources for receiving mental health support:

1. **Savaira**

   Savaira provides the following two major mental health support resources:

   - **Wellness Centers for Community Mental Health Counseling**

     These centers have been placed in shipping-containers at three locations:

     - Lyari General Hospital, Karachi
     - Sindh Government Hospital, Karachi
     - Basic Health Unit in Darsano, Sindh

   - **Department of Psychiatry & Behavioral Sciences at Jinnah Hospital Karachi**

     Address:
     26, Block-A,
     Sindhi Muslim Cooperative Housing Society (SMCHS),
     Karachi, 74400,
     Pakistan.

     Contact Number: +92-21-34315190-94
     Email: info@savaira.org

2. **Umang Mental Health Helpline - 24/7 (free of cost)**

   Contact Number: +92-311-7786264

3. **Sehatyab – Online Clinic, Consultation, & Therapies**

   Contact Number: +92-340-1111606

4. **Humraaz (cellphone application in Google & Apple Stores) & Toll-Free Helpline 1166**

5. **Jeet Healing Center (JHC) for Counseling**

   JHC provides counseling by the following four means:

   - In-person Counseling
   - Telephonic Counseling
   - Email Counseling
   - Out-reach

   Direct Helpline for Counseling: +92-51-2850574

   Email: jeet@sahil.org
   Tool-Free Line: 0800-13518

6. **Ruhbaru – Online and Tele-Mental-Health Platform for Counseling and Therapy**

   Contact Numbers: 021-99215720 & +92-333-3337664

7. **Sehat Kahani (a mobile-phone application) & Mental Health Helpline**

   Address:
   Plot # 43-C, 4th Floor - Bukhari Commercial,
   Lane #10, DHA Phase 6
   Karachi, Pakistan.

   Contact Number: +92-21-36100774

   Email: info@sehatkahani.com

8. **Karwan-e-Hayat (Psychiatric Care & Rehabilitation Centre)**

   It provides free mental health services to needy patients.

   Address:
   Karwan-e-Hayat Psychiatric Care and Rehabilitation Centre,
   Near KPT Hospital and Ziauddin Hospital,
   Keamari, Karachi.

   Phone: UAN: (021) 111-534-111
   Email: info@keh.org.pk

9. **Psychthru – Online Counseling Platform**

   psychthru.com

10. **Rozan Counseling Helpline**

    Contact Number: 0304-1111741

11. **Taskeen – Free Online Support**

    Address:
    Office No. 2, 1st floor, Plot 17-C,
    2nd Zamzama Commercial Lane,
    Phase 5, DHA, Karachi.

    Contact Number: 0316-8275336

12. **Umed-e-Nau Clinic – Institute of Professional Psychology**

    Address:
    13 National Stadium Road,
    Karsaz, Faisal Cantonment,
    Karachi.

    Contact Number: 0332-3215052

13. **Dr. AQ Khan - Institute of Behavioral Sciences**

    Address:
    Gulzar-e-Hijri, Scheme 33, Karachi

    Contact Number: 021-99261455

14. **Care for Health**

    Address:
    5th floor, Amir Trade Center,
    Shahra-e-Quaideen, Karachi.

    Contact Number: 0334-2021283

Appendix I

List of Mental Health Support Services in Karachi, Pakistan (Urdu)

کراچی، پاکستان میں مینٹل ہیلتھ سپورٹ سروسز کی فہرست

تحقیق میں حصہ لینے کے بعد، اگر آپ کو کسی قسم کی جذباتی تکلیف محسوس ہو، تو آپ مدد حاصل کرنے کے لیے درج ذیل وسائل میں سے کسی سے رابطہ کر سکتے ہیں۔

1. سویرا

سویرا،مندرجہ ذیل دو اہم ذہنی صحت کے معاون وسائل فراہم کرتا ہے:

کمیونٹی مینٹل ہیلتھ کونسلنگ کے لیے فلاحی مراکز:
یہ مراکز تین مقامات پر شپنگ کنٹینرز میں قائم کئے گئے ہیں:
لیاری جنرل ہسپتال، کراچی
سندھ گورنمنٹ ہسپتال، کراچی
بنیادی صحت کامرکز، درسانوسندھ

جناح ہسپتال کراچی میں شعبہ نفسیات اور طرز عمل سائنسز:

پتہ:
26، بلاک-اے،
سندھی مسلم کوآپریٹو ہاؤسنگ سوسائٹی
(SMCHS)
کراچی، 74400،
پاکستان
رابطہ نمبر: +92-21-34315190-94
ای میل: info@savaira.org

2. امنگ مینٹل ہیلتھ ہیلپ لائن (مفت)
رابطہ نمبر: +92-311-7786264

3. صحتیاب آن لائن کلینک، مشاورت اور علاج
رابطہ نمبر: +92-340-1111606

4. ہمراز (گوگل اور ایپل اسٹورز میں سیل فون ایپلی کیشن) اور ٹول فری ہیلپ لائن 1166

5. مشاورت کے لیے جیت ہیلنگ سینٹر
(JHC)
JHC مندرجہ ذیل چار طریقوں سے مشاورت فراہم کرتا ہے:

ذاتی مشاورت
ٹیلی فونک مشاورت
ای میل مشاورت
آؤٹ ریچ

مشاورت کے لیے براہ راست ہیلپ لائن:
92-51-2850574+
ای میل: jeet@sahil.org
ٹول فری لائن: 13518-0800

6. رہبرو-آن لائن اور ٹیلی مینٹل ہیلتھ پلیٹ فارم برائے مشاورت اور علاج
رابطہ نمبر: 99215720-021 اور +92-333-3337664

7. صحت کہانی (ایک موبائل فون ایپلی کیشن) اور دماغی صحت کی ہیلپ لائن
پتہ:
پلاٹ # C-43، چوتھی منزل - بخاری کمرشل، لین نمبر 10، ڈی ایچ اے فیز 6
کراچی، پاکستان۔
رابطہ نمبر: +92-21-36100774
ای میل: info@sehatkahani.com

8. کاروان حیات (نفسیاتی نگہداشت اور بحالی کا مرکز)
یہ ضرورت مند مریضوں کو دماغی صحت کی مفت خدمات فراہم کرتا ہے۔
پتہ:
کاروان حیات نفسیاتی نگہداشت اور بحالی مرکز،
کے پی ٹی ہسپتال اور ضیاء الدین ہسپتال کے قریب،
کیماڑی، کراچی۔
فون نمبر: UAN: (021) 111-534-111
ای میل: info@keh.org.pk

9. سائیک تھرو - آن لائن کونسلنگ پلیٹ فارم
psychthru.com

10. روزان کاؤنسلنگ ہیلپ لائن
رابطہ نمبر: 0304-1111741

11. تسکین - مفت آن لائن سپورٹ
پتہ:
آفس نمبر 2، پہلی منزل، پلاٹ C-17،
دوسری زمزمہ کمرشل لین،

فیز 5، ڈی ایچ اے، کراچی۔
رابطہ نمبر: 8275336-0316

12. امید نو کلینک - انسٹی ٹیوٹ آف پروفیشنل سائیکالوجی
پتہ:
13 نیشنل اسٹیڈیم روڈ،
کارساز، فیصل چھاؤنی،
کراچی۔
رابطہ نمبر: 3215052-0332

13. ڈاکٹر اے کیو خان - انسٹی ٹیوٹ آف بیویورل سائنسز
پتہ:
گلزارِ ہجری، اسکیم 33، کراچی
رابطہ نمبر: 99261455-021

14. صحت کی دیکھ بھال
پتہ:
پانچویں منزل، امیر ٹریڈ سینٹر،
شاہراہ قائدین، کراچی۔
رابطہ نمبر: 2021283-0334

Appendix J

Interview Guide for Qualitative Study

Question	Probes for Participants	Training of Data Collectors
Prenatal Group		
Q1. What were your experiences during your wife's pregnancy?	• How did you feel? • What emotions did you experience? • What made you feel this way?	The participants could have experienced happy moments, worrisome thoughts, stress, anxiety, depression or being depressed, and being upset.
<u>If experienced worries, stress, and / or anxiety, then ask these questions</u>: Q2. What were the reasons behind your worrisome thoughts, stress, and / or anxiety at that time?	• What made the experience worse?	
Q3. How did you express your worries, stress, and / or anxiety at that time?	• What actions did you take when you felt that way?	Discuss with whom, remain quiet, shouting on whom, use of abusive language with whom, become violent with whom, meditate, use of substance abuse and which substance.
Q4. Why do you think you expressed your worries, stress, and / or anxiety, the way you expressed them?	• Seen or learnt from friends, father, drama / film, manly attribute, culture / society.	
Q5. What are the ways by which your stress and / or anxiety could have been reduced at that time?		
<u>If experienced happiness or joy, then ask these questions</u>: Q6. What made you feel happy, joy, or uplifted?	• What made the experience better?	
Q7. How did you express your happiness at that time?		
Q8. Why do you think you expressed your happiness the way you expressed it?		
Q9. Is there anything else you would like to tell me about your experience?		
Postnatal Group		•

• Intrapartum Phase: • Q1. What were your experiences during your wife's delivery? • <u>If experienced worries, stress, and / or anxiety, then ask these questions</u>: • Q2. What were the reasons behind your worrisome thoughts, stress, and / or anxiety at that time? • Q3. How did you express your worries, stress, and / or anxiety at that time? • Q4. Why do you think you expressed your worries, stress, and / or anxiety, the way you expressed them? • Q5. What are the ways by which your stress and / or anxiety could have been reduced at that time? • <u>If experienced happiness or joy, then ask these questions</u>: • Q6. What made you feel happy, joy, or uplifted? • Q7. How did you express your happiness at that time? • Q8. Why do you think you expressed your happiness the way you expressed it?	• How did you feel? • What emotions did you experience? • What made you feel this way? • What made the experience worse? • What actions did you take when you felt that way? • Seen or learnt from friends, father, drama / film, manly attribute, culture / society. • What made the experience better? • How did you feel? • What emotions did you experience?	• The participants could have experienced happy moments, worrisome thoughts, stress, anxiety, depression or being depressed, and being upset. • Discuss with whom, remain quiet, shouting on whom, use of abusive language with whom, become violent with whom, meditate, use of substance abuse and which substance. • The participants could have experienced happy

• Q9. Is there anything else you would like to tell me about your experience?	• What made you feel this way?	moments, worrisome thoughts, stress, anxiety, depression or being depressed, and being upset.
• Postpartum Phase: • Q1. What were your experiences after your wife's delivery?	• What made the experience worse?	
	• What actions did you take, when you felt that way?	• Discuss with whom, remain quiet, shouting on whom, use of abusive language with whom, become violent with whom, meditate, use of substance abuse and which substance.
• <u>If experienced worries, stress, and / or anxiety, then ask these questions</u>: • Q2. What were the reasons behind your worrisome thoughts, stress, and / or anxiety at that time? • Q3. How did you express your worries, stress, and / or anxiety at that time?	• Seen or learnt from friends, father, drama / film, manly attribute, culture / society.	
• Q4. Why do you think you expressed your worries, stress, and / or anxiety, the way you expressed them? • Q5. What are the ways by which your stress and / or anxiety could have been reduced at that time?	• What made the experience better?	
• <u>If experienced happiness or joy, then ask these questions</u>: • Q6. What made you feel happy, joy, or uplifted? • Q7. How did you express your		

happiness at that time? • Q8. Why do you think you expressed your happiness the way you expressed it? • Q9. Is there anything else you would like to tell me about your experience?	

Appendix K

Interview Questions

Interview Questions: Prenatal Group

Q1. What were your experiences during your wife's pregnancy?

<u>If experienced worrisome, stress, and / or anxiety, then ask these questions</u>:
Q2. What were the reasons behind your worrisome thoughts, stress, and / or anxiety at that time?
Q3. How did you express your worries, stress, and / or anxiety at that time?
Q4. Why do you think you expressed your worries, stress, and / or anxiety, the way you expressed them?
Q5. What are the ways by which your stress and / or anxiety could have been reduced at that time?

<u>If experienced happiness or joy, then ask these questions</u>:
Q6. What made you feel happy, joy, or uplifted?
Q7. How did you express your happiness at that time?
Q8. Why do you think you expressed your happiness the way you expressed it?

Q9. Is there anything else you would like to tell me about your experience?

Interview Questions: Postnatal Group – Intrapartum Phase

Q1. What were your experiences during your wife's delivery?

<u>If experienced worrisome, stress, and / or anxiety, then ask these questions</u>:
Q2. What were the reasons behind your worrisome thoughts, stress, and / or anxiety at that time?
Q3. How did you express your worries, stress, and / or anxiety at that time?
Q4. Why do you think you expressed your worries, stress, and / or anxiety, the way you expressed them?
Q5. What are the ways by which your stress and / or anxiety could have been reduced at that time?

<u>If experienced happiness or joy, then ask these questions</u>:
Q6. What made you feel happy, joy, or uplifted?
Q7. How did you express your happiness at that time?
Q8. Why do you think you expressed your happiness the way you expressed it?

Q9. Is there anything else you would like to tell me about your experience?

Interview Questions: Postnatal Group – Postpartum Phase

Q1. What were your experiences after your wife's delivery?

<u>If experienced worrisome, stress, and / or anxiety, then ask these questions</u>:
Q2. What were the reasons behind your worrisome thoughts, stress, and / or anxiety at that time?
Q3. How did you express your worries, stress, and / or anxiety at that time?
Q4. Why do you think you expressed your worries, stress, and / or anxiety, the way you expressed them?
Q5. What are the ways by which your stress and / or anxiety could have been reduced at that time?

<u>If experienced happiness or joy, then ask these questions</u>:
Q6. What made you feel happy, joy, or uplifted?
Q7. How did you express your happiness at that time?
Q8. Why do you think you expressed your happiness the way you expressed it?

Q9. Is there anything else you would like to tell me about your experience?

Appendix L

Interview Questions (Urdu)

انٹرویو کے سوالات: حمل کے دوران کا گروپ

آپ کی بیوی کے حمل کے دوران آپ کے تجربات کیا تھے؟

اگر پریشانی ، تناؤ، یا اضطراب کا سامنا ہے، تو یہ سوالات پوچھیں

اس وقت آپ کے پریشان کن خیالات، تناؤ، اور/یا پریشانی کے پیچھے کیا وجوہات تھیں؟

اس وقت آپ نے اپنے تناؤ، یا پریشانی کا اظہار کیسے کیا؟

آپ نے اپنے تناؤیا پریشانی کا اظہار اس طرح سے کیوں کیا؟

ان طریقوں کی وضاحت کریں جن سے اس وقت آپ کے تناؤ اور/یا پریشانی کو کم کیا جا سکتا تھا؟

اگر خوشی کا تجربہ ہو، تو یہ سوالات پوچھیں

کس چیز نے آپ کو خوشی کا احساس دلایا؟

اس وقت آپ نے اپنی خوشی کا اظہار کیسے کیا؟

آپ نے اپنی خوشی کا اظہار اس طرح سے کیوں کیا؟

کیا آپ مجھے اپنے تجربے کے بارے میں کچھ اور بتانا چاہیں گے؟

انٹرویو کے سوالات: بعد از پیدائش گروپ

پیدائش کے مرحلے کے دوران

پیدائش کے مرحلے کے دوران آپ کے تجربات کیا تھے؟

اگر پریشانی ، تناؤ، یا اضطراب کا سامنا ہے، تو یہ سوالات پوچھیں

اس وقت آپ کے پریشان کن خیالات، تناؤ، اور/یا پریشانی کے پیچھے کیا وجوہات تھیں؟

اس وقت آپ نے اپنے تناؤ، یا پریشانی کا اظہار کیسے کیا؟

آپ نے اپنے تناؤیا پریشانی کا اظہار اس طرح سے کیوں کیا؟

ان طریقوں کی وضاحت کریں جن سے اس وقت آپ کے تناؤ اور/یا پریشانی کو کم کیا جا سکتا تھا؟

اگر خوشی کا تجربہ ہو، تو یہ سوالات پوچھیں

کس چیز نے آپ کو خوشی کا احساس دلایا؟

اس وقت آپ نے اپنی خوشی کا اظہار کیسے کیا؟

آپ نے اپنی خوشی کا اظہار اس طرح سے کیوں کیا؟

کیا آپ مجھے اپنے تجربے کے بارے میں کچھ اور بتانا چاہیں گے؟

بعد از پیدائش کا مرحلہ

بعد از پیدائش آپ کے تجربات کیا تھے؟

اگر پریشانی ، تناؤ، یا اضطراب کا سامنا ہے، تو یہ سوالات پوچھیں

اس وقت آپ کے پریشان کن خیالات، تناؤ، اور/یا پریشانی کے پیچھے کیا وجوہات تھیں؟

اس وقت آپ نے اپنے تناؤ، یا پریشانی کا اظہار کیسے کیا؟

آپ نے اپنے تناؤیا پریشانی کا اظہار اس طرح سے کیوں کیا؟

ان طریقوں کی وضاحت کریں جن سے اس وقت آپ کے تناؤ اور/یا پریشانی کو کم کیا جا سکتا تھا؟

اگر خوشی کا تجربہ ہو، تو یہ سوالات پوچھیں

کس چیز نے آپ کو خوشی کا احساس دلایا؟

اس وقت آپ نے اپنی خوشی کا اظہار کیسے کیا؟

آپ نے اپنی خوشی کا اظہار اس طرح سے کیوں کیا؟

کیا آپ مجھے اپنے تجربے کے بارے میں کچھ اور بتانا چاہیں گے؟

Appendix M

Kessler's K6 Scale

Veterans Affairs Canada / Anciens Combattants Canada

Kessler Psychological Distress Scale (K6)

Protected when completed.

Family name	Given Names	File No.

Address	Date of assessment (yyyy-mm-dd)	Date of birth (yyyy-mm-dd)

The Kessler Psychological Distress Scale (K6)[1] is a simple measure of psychological distress which involves 6 questions about a person's emotional state. Each question is scored from 0 (None of the time) to 4 (All of the time). Scores of the 6 questions are then summed, yielding a minimum score of 0 and a maximum score of 24. Low scores indicate low levels of psychological distress and high scores indicate high levels of psychological distress.

The following questions are about how you have been feeling during the **past 30 days**.	ALL	MOST	SOME	A LITTLE	NONE	(IF VOL) DON'T KNOW	(IF VOL) REFUSED
1. About how often during the past 30 days did you feel **nervous** - would you say **all** of the time, **most** of the time, **some** of the time, **a little** of the time, or **none** of the time?	○	○	○	○	○	○	○
2. During the past 30 days, about how often did you feel **hopeless - all** of the time, **most** of the time, **some** of the time, **a little** of the time, or **none** of the time?	○	○	○	○	○	○	○
3. During the past 30 days, about how often did you feel **restless or fidgety**? (IF NEC: **all, most, some, a little,** or **none** of the time?)	○	○	○	○	○	○	○
4. How often did you feel **so depressed that nothing could cheer you up**? (IF NEC: **all, most, some, a little,** or **none** of the time?)	○	○	○	○	○	○	○
5. During the past 30 days, about how often did you feel that **everything was an effort**? (IF NEC: **all, most, some, a little,** or **none** of the time?)	○	○	○	○	○	○	○
6. During the past 30 days, about how often did you feel **worthless**? (IF NEC: **all, most, some, a little,** or **none** of the time?)	○	○	○	○	○	○	○

[1]Source: Kessler, R.C., Barker, P.R., Colpe, L.J., Epstein, J.F., Gfroerer, J.C., Hiripi, E., Howes, M.J., Normand, S.L.T., Manderscheid, R.W., Walters, E.E., Zaslavsky, A.M. (2003). Screening for serious mental illness in the general population. Archives of General Psychiatry. 60(2):184-9.

The client's personal information is collected under the authority of the *Veterans Health Care Regulations* for the purpose of administering benefits and services. Provision of the information is on a voluntary basis. Any personal information recorded on this form is accessible by the individual to whom it relates.

All personal information collected and used is protected from unauthorized disclosure by the *Privacy Act*. The *Privacy Act* provides the client with a right to access his or her own personal information which is under the control of the Department. The *Privacy Act* also affords the client the right to challenge the accuracy and completeness of his or her personal information and have it amended as appropriate.

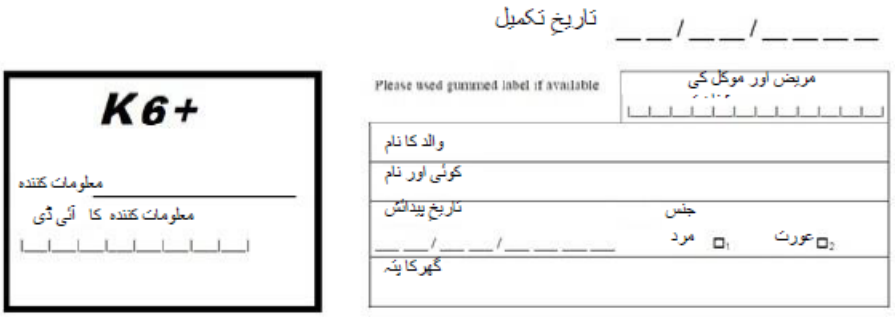
The client may request a copy of this form by writing to the Access to Information and Privacy Coordinator's Office, Veterans Affairs Canada, PO Box 7700, Charlottetown, PE, C1A 8M9 and by quoting Personal Information Bank No. VAC PPU 020 and/or VAC PPU 030.

Name of assessor	Professional designation	Date (yyyy-mm-dd)

VAC 802e (2010-04) Ce formulaire est disponible en français. Canada Page 1 of 2

Appendix N

Kessler's K6 Scale (Urdu)



تاریخِ تکمیل ___ ___ / ___ ___ / ___ ___ ___ ___

K6+

معلومات کنندہ _____

معلومات کنندہ کا آئی ڈی

Please used gummed label if available

مریض اور موکل کی

والد کا نام

کوئی اور نام

تاریخ پیدائش ___ ___ / ___ ___ / ___ ___ ___ ___

جنس

مرد □1 عورت □2

گھر کا پتہ

کیسلر نفسیاتی دباو کا پیمانہ (K6+)

نیچے دئیے گئے سوالات میں آپ سے پوچھا گیا ہے کہ آپ پچھلے 30 دنوں میں کیسا محسوس کرتے رہے ہیں۔ برائے مہربانی ہر سوال کے لیے، اُس نمبر کے گرد دائرہ لگائیں جو اس بات کی بہترین وضاحت کرتا ہو کہ آپ نے اس کیفیت کو کتنی مرتبہ محسوس کیا۔

Q1 پچھلے مہینے میں آپ نے کتنا محسوس کیا ؟	ہر وقت 1	زیادہ تر 2	کبھی کبھار 3	بہت کم وقت 4	کبھی بھی نہیں 5
a۔ گھبراہٹ ؟					
b۔ نا اُمید؟					
c۔ بے آرام یا بے چین؟					
d۔ اتنے اُداس کہ کوئی چیز آپ کو خوش نہ کر سکتی تھی؟					
e۔ یہ کہ ہر چیز ایک کوشش تھی؟					
f۔ بے وقعت؟					

Q2:پچھلے چھ سوالات آپ کے احساسات سے متعلق تھے جو آپ نے پچھلے 30 دنوں میں محسوس کیے ہوں گے۔ مجموعی طور پر، کیا تمام احساسات پچھلے 30 دنوں میں معمول سے زیادہ، تقریباً معمول کے مطابق یا معمول سے کم ہوئے؟ (اگر آپ نے کبھی بھی ایسے احساسات کو محسوس نہیں کیا تو نمبر 4 پر دائرہ لگائیں)

معمول سے زیادہ	تقریباً معمول جتنے ہی	معمول سے کم

Developed by Ronald C. Kessler, Ph.D, McNeil Family Professor of Health Care Policy, Department of Health Care Policy, Harvard Medical School, 180 Longwood Avenue Boston MA 02115

Translated by Sidra Ghafoor, Aisha Sitwat, Ph.D Centre for Clinical Psychology, University of the Punjab, Lahore-Pakistan & Rukhsana Kausar, Ph.D Institute of Applied Psychology, University of the Punjab, Lahore-Pakistan

Appendix O

Recruitment Advertisement for Study Participants (Script)

I, Sadaf Zindani, is a PhD student at the University of Ottawa, Canada. I am conducting research on exploring the men's experiences during their wives' perinatal period. You are invited to participate in this qualitative study. Your participation will help the researcher to understand your experiences and feelings during your wives' perinatal period. The information shared by you can help researchers and policymakers in developing interventions and / or policies for the men going through the perinatal period.

To confirm your eligibility for participating in the study, you will be screened with K-6 Scale and Health Information Form because fathers experiencing any symptoms of mental distress, having preterm baby, and adverse pregnancy outcome will not be included as a participant in the study.

After confirming the eligibility status of your participation in the study, the interview will be conducted as per your convenience and feasibility. Your information will be kept confidential. You can choose not to answer any question or withdraw from the study at any time. Your decision to participate, or not to participate, or not to continue, will have no adverse effects on the treatment of your wife and baby.

In case of any matter related to research, you can contact me at the Saifee Burhani School of Nursing (SBSON), Karachi, which is linked with and situated adjacent to the Saifee Hospital, Karachi. I am working at the school as a 'Principal' and my official contact information is provided below:

Contact #: +92-213-6649864

Email: principal@sbson.edu.pk

Appendix P

Demographic Data Form

Full Name: **ID #:**

Contact #: **Email Address:**

Date of Birth / Age: **Ethnicity:** **Religion:**

Residential Address:

Income Range:

Below 50,000	100,000-200,000
200,000-300,000	>300,000

Education Level:

Primary	Middle	Secondary
Higher Secondary	Diploma or Certificate	Undergraduate
Master	Doctorate	Post-doctorate

Occupation: **Designation:**

Type of Family System:

Nuclear (you, your wife and your infant)	Joint / Extended

Type of Work:

Self-employed	Business-owner
Employed	Unemployed

Research Associate's Name, Signature & Date:

Appendix Q

Demographic Data Form (Urdu)

آبادیاتی ڈیٹا فارم

شناختی نمبر **پورا نام**

رابطہ نمبر **ای میل اڈریس**

تاریخ پیدائش/عمر **مذہب** **نسل**

رہائشی پتہ

آمدنی کی حد

تین لاکھ سے زیادہ دو لاکھ سے تین لاکھ ایک لاکھ سے دو لاکھ 50,000سے نیچے

تعلیم

پرائمری تعلیم مڈل پاس میٹرک تک تعلیم

اعلی ثانوی تعلیم ڈپلومہ یا سرٹیفکیٹ ا انڈر گریجویٹ ڈگری

ماسٹر کی ڈگری کی سند ڈاکٹریٹ پوسٹ ڈاکٹریٹ کی سند

پیشہ **عہدہ**

خاندانی نظام کی قسم

انفرادی خاندان (آپ، آپ کی بیوی اور آپ کا بچہ) مشترکہ خاندانی نظام

کام کی نوعیت

خود ملازم کاروبار کا مالک ملازمت پیشہ بےروزگار

ڈیٹا جمع کرنے والے کا نام، دستخط اور تاریخ

Appendix R

Health Information Form

Full Name: **ID #:**

Contact #: **Email Address:**

Present Illness:

Past Illness:

Medications (taken regularly, if any):

Month of Wife's Pregnancy:

Delivery Date / Expected Delivery Date:

Age of Newborn (if delivered): **Sex of Newborn (if delivered):**

Research Associate's Name, Signature & Date:

Appendix S

Health Information Form (Urdu)

صحت کی معلومات کا فارم

شناختی نمبر **پورا نام**

رابطہ نمبر **ای میل اڈریس**

ماضی کی بیماری

موجودہ بیماری

باقاعدگی سے لی جانے وا لی ادویات

بیوی کے حمل کا مہینہ

تاریخ کی بچہ کی پیدائش /متوقع تاریخ

نوزائیدہ کی عمر (اگر ڈیلیوری ہوگی ہو)

نوزائیدہ کی جنس (اگر ڈیلیوری ہوگی ہو)

ڈیٹا جمع کرنے والے کا نام، دستخط اور تاریخ

Appendix T

Training Protocol for Research Associates (RAs)

The following 10 components will be covered during the Research Associates' training session:

1. Confidentiality Agreement:

Confidentiality Agreement will be discussed with and signed by all the RAs before the beginning of the training session.

2. Research Ethics Involving Humans

The general principles of WMA (World Medical Association - WMA) Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Subjects will be discussed with the RAs to ensure the respect, rights, health, and wellbeing of the participants.

3. Introduction and Background

The RAs will be equipped with the necessary background knowledge of the study and related methods. They will be provided with the main purpose of collecting data via specific interview questions and components of the Biodata Form.

4. Consent Form

The RAs will be familiarized with the content and concept of the Consent Form to ensure the rights of the study participants. They will also be trained regarding the technique of taking consent from the study participants.

5. Biodata Form

The components of the Biodata Form will be discussed with the RAs and they will be trained about filling those components accurately.

6. Interview Guide

The similar understanding of interviewing techniques (verbal and non-verbal clues / gestures) will be imparted to all the RAs. Each question will be discussed among all the RAs for enhancing the inter-observer reliability. Use of probes will be reviewed with the RAs.

7. Field Notes and Reflective Logs

Concerning the importance of taking Field Notes and writing Reflective Logs, deliberations will be made with the RAs and they will be trained for these data collection techniques also. The data collected through these means will increase the validity of the data and its findings.

8. Practice Workshop

A workshop will be conducted to give hands-on practice to all the RAs regarding taking consent from the study participants, filling of Biodata Form, conducting and transcribing interviews, recording observations, taking Field Notes, and writing Reflective Logs, in order to minimize error and inter-rater variability.

9. Training Log

A Training Log will be created by the PI capturing the information of the understanding and practice of those components for which training was provided to the RAs. This Training Log will be signed by all the RAs and the trainer (i.e., PI). PI will provide supervision to all the RAs throughout the data collection process and period, for confirming the reliability and validity of the collected data.

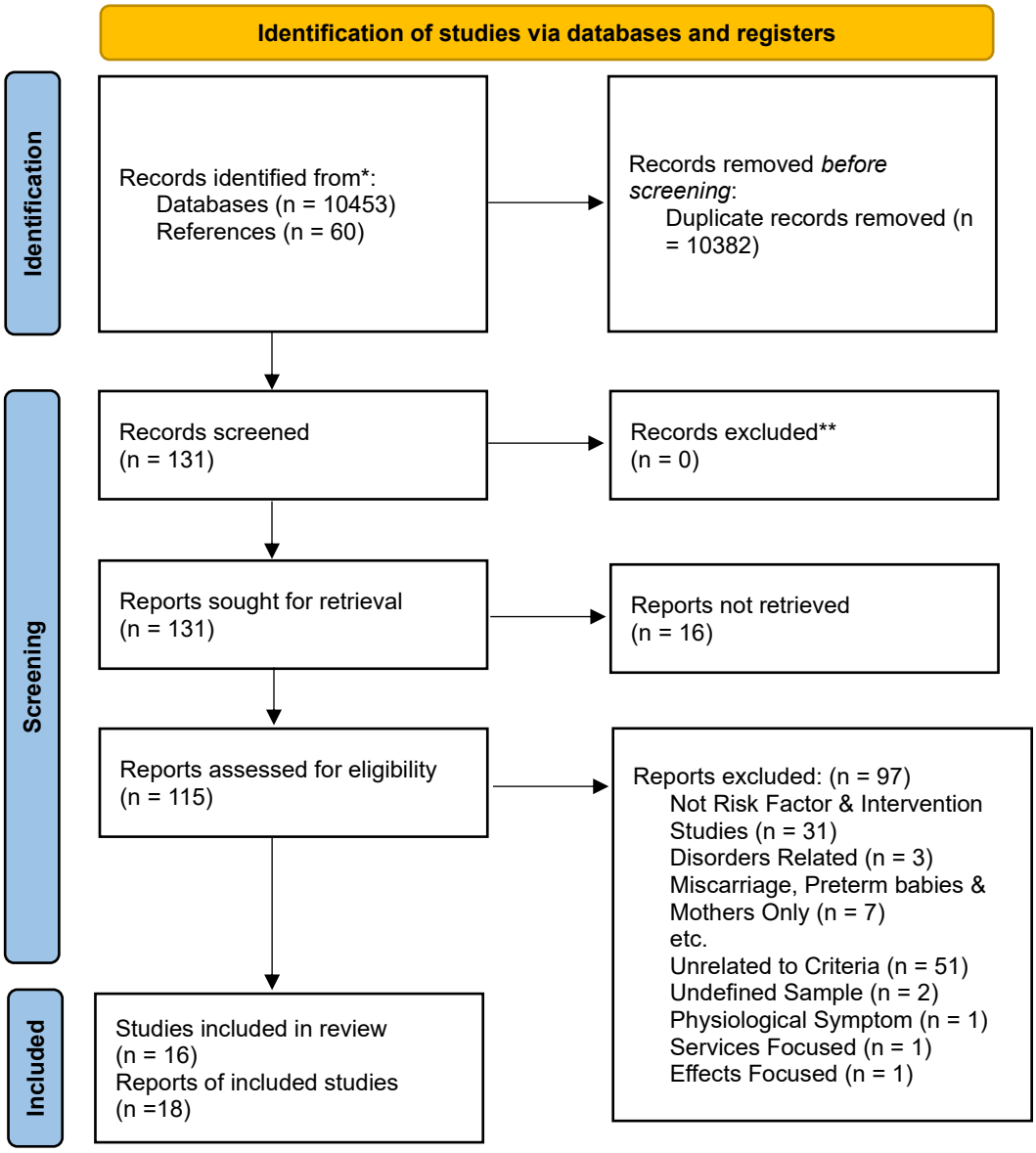
10. Delegation Log

A Delegation Log will be designed by the PI recording the tasks delegated to the RAs. This log will be signed by the PI and all the RAs.

Appendix U

Figure 1

PRISMA Flow Chart



From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

Appendix V

Table 1

Search Strategy

Search Term: (firsttime fathers or firsttime dads) OR (first time fathers or first time dads) OR (first-time fathers or first-time dads) OR (new fathers or new dads or new expect* men) OR firsttime expect* men OR first time expect* men OR first-time expect* men OR (first time expect* fathers or first time expect* dads) OR (new expect* fathers or new expect* dads) OR paternal OR (firsttime expect* fathers or firsttime expect* dads) OR (first-time expect* fathers or first-time expect* dads) AND (anxi* or uneas* or nervous* or worr* or fear* or concern* or apprehensi*) OR (psychological distress or stress) OR depress* OR (sad or sadness) OR (misery or sorrow or grief or blue) OR hopeless* OR unhapp* AND psychosocial factors OR psychosocial impacts OR psychosocial effects OR risk factors OR contributing factors OR influencing factors OR predisposing factors OR predictors OR cause AND perinatal OR (antenatal or antepartum) OR (during birth or during delivery) OR (postnatal or postpartum) OR postpartum OR intrapartum OR pregnancy OR delivery OR labour OR birth OR before birth OR after birth			
Database	Inclusion Criteria		Result
CINAHL	Publication Date:	January 01, 2020, to January 04, 2023	33
	Language:	English	
PubMed	Availability:	Full Text	4868
Embase			3930
MedLine			1493
PsycInfo			129
References			60

Appendix W

Table 2

Summary Characteristics of Reviewed Studies [a] (n = 16)

Country	First Author	Year	Study Type	Sample Size	Sample Characteristics
Australia				Country Total (870)	
	Matthey	2000	Quantitative Cross-Sectional Study (a part of a larger longitudinal study)	146	Age: Mean Age = 30.8 Years Education Status: • < Secondary Education (23.6%) • Secondary Education (14.6%) • University Degree (50.4%)
	Buist	2003	Quantitative Longitudinal Study	118	Age: Mean Age = 31 Years Employment Status: Fulltime (79%) Marital Status: Married (75.5%)
	Condon	2004	Quantitative Longitudinal Cohort Study	312	Age: 29 ± 5 Years Marital Status: • Married (69%) • De facto[b] (28%) • Single (3%) Education Status: • High School (46%) • Trade School (30%)
	Boyce	2007	Quantitative Longitudinal Cohort Study		

					• Undergraduate (18%) • Postgraduate (6%) Employment Status: • Fulltime (86%) • Parttime (5%) • Student (4%) • Unemployed (5%)
	Chhabra	2022	Mixed Method (First-time fathers in Qualitative Study *n* = 11 & Fathers with no previous children in Quantitative, Online Cross-Sectional Survey Study *n* = 283)	294	Age: Mean Age = 32.6 Years Marital Status: Married (*n* = 8) Ethnicity: • Australian (*n* = 7) • Indian (*n* = 2) • African (*n* = 1) • Brazilian (*n* = 1) • Portuguese (*n* = 1) Education Status: • Undergraduate (*n* = 8) • Postgraduate (*n* = 4) Employment Status: • Fulltime (*n* = 6) • Parttime (*n* = 5) • Unemployed (*n* = 1)
Canada				Country Total (622)	
	Da Costa	2017	Quantitative Cross-Sectional Study	622	Age: 34.27 ± 5.01 Years Ethnicity: White (*n* = 366, 75.46%) Marital Status: • Married (*n* = 408, 83.78%) • Cohabitating (*n* = 79, 16.22%) Education Status: University (*n* = 347, 71.4%) Employment Status: Working (*n* = 446, 91.85%)
	Da Costa	2019	Quantitative		

			Prospective Cohort Study		
China				Country Total (736)	
	Mao	2011	Quantitative Cross-Sectional Study	376	Age: 27.09 ± 4.46 Years Education Status: • < 12 Years (*n* = 72, 19.2%) • 12 Years Completed (*n* = 123, 32.7%) • ≥ Associate Degree (*n* = 181, 48.1%) Employment Status: • Fulltime / Parttime (*n* = 343, 91.2%) • Unemployed (*n* = 20, 8.8%)
	Lu	2012	Quantitative Cross-Sectional Study	194	Age: • < 23 Years (*n* = 10, 5.1%) • 24-34 Years (*n* = 148, 76.3%) • ≥ 35 Years (*n* = 36, 18.6%) Education Status: • High School or Below (*n* = 52, 26.8%) • University or Above (*n* = 142, 73.2%) Employment Status: • Employed (*n* = 178, 91.8%) • Parttime or Unemployed (*n* = 16, 8.2%)
	Zhang	2016	Quantitative Longitudinal Study	166	Age (based on *n* = 174): • < 30 Years (*n* = 88, 48.2%) • ≥ 30 Years (*n* = 86, 51.8%) Employment Status: • Employed (*n* = 152, 91.6%) • Unemployed (*n* = 14, 8.4%) Education Status: • Below Middle School (*n* = 29, 17.5%)

					• High School (*n* = 31, 18.7%) • Baccalaureate and Above (*n* = 106, 63.9%) Residence: • Urban (*n* = 120, 72.3%) • Rural (*n* = 46, 27.7%)
Sweden				Country Total (1217)	
	Thomas	2011	Quantitative Prospective Longitudinal Cohort Study	405	Age: • < 25 Years (*n* = 35, 9%) • 25-35 Years (*n* = 292, 75.3%) • > 35 Years (*n* = 61, 15.7%) Marital Status: • Married / Cohabitating (*n* = 376, 96.9%) • Single (*n* = 12, 3.1%) Education Status: • Primary School (*n* = 20, 5.2%) • High School (*n* = 223, 57.6%) • University (*n* = 144, 37.2%)
	Bergstrom	2013	Quantitative Survey-based Study, associated with a Randomized Controlled Trial (RCT)	812	Age: Mean Age = 31 Years Marital Status: Married / Cohabitating (*n* = 798, 98.4%) Education Status: College / University (*n* = 338, 41.8%) Income: Low Household Income (*n* = 195, 24.9%)
Taiwan				Country Total (83)	
	Wang	2006	Quantitative	83	Age: 32.83 ± 4.39 Years Education Status: Beyond College (45%)

			Cross-Sectional Descriptive Study		Socioeconomic Status: • Middle Class (53%) • High Class (25%) • Lower Class (22%)
United Kingdom				Country Total (87)	
	Castle	2008	Quantitative Study (Pre & Post Educational Intervention Study)	66	Age: 32.9 ± 5.1 Years Marital Status: Married (*n* = 50, 75.8%) Employment Status: Employed (*n* = 66, 100%) Ethnicity: White European (89.4%)
	Baldwin	2019	Qualitative Study with Semi-Structured Interviews	21	Age: • 20-24 Years (*n* = 1) • 30-34 Years (*n* = 9) • 35-39 Years (*n* = 7) • 40-44 Years (*n* = 2) • Over 60 Years (*n* = 1) Ethnicity: • Indian (*n* = 10) • Spanish (*n* = 1) • White British (*n* = 7) • Pakistani (*n* = 1) • Black Caribbean (*n* = 1) • Black African (*n* = 1) Religion: • Hindu (*n* = 8) • Christian (*n* = 4) • Muslim (*n* = 2) • Sikh (n = 1)

					• No Religion (*n* = 6) Employment Status: • Fulltime (*n* = 19) • Parttime (*n* = 2) Education Status: • A levels [c] (*n* = 1) • Degree (*n* = 11) • MSc or PhD (*n* = 7) • GCSE (*n* = 1)
United States of America				Country Total (272)	
	Leathers	2000	Quantitative Study (Pre & Post Delivery Survey)	124	Age: 31.5 ±5 Years Ethnicity: • White (58.9%) • African American (25%) • Hispanic (7.7%) • Asian (7.7%) Formal Education: 17 Years (Average) Residence: • Urban (34%) • Suburban (66%)
	Gjerdingen	2003	Quantitative Prospective Study	129	Age: 30.5 ± 4.5 Years Education: College Degree or Higher (65.1%) Marital Status: Married (91.5%) Employment Status: Employed (98.4%) Ethnicity: White (92.1%)
	Pollock	2005	Quantitative Non-experimental Pilot Study	19	Age: • 18-25 Years (*n* =2, 11%) • 26-35 Years (*n* = 13, 68%)

- 36-45 Years (*n* = 4, 21%)

Education Status:

- High School (*n* = 3, 15.8%)
- College (*n* = 12, 63.2%)
- Postgraduate (*n* = 4, 21.1%)

Ethnicity:

- White (*n* = 18, 94.7%)
- African American (*n* = 1, 5.3%)

Marital Status:

- Married (*n* = 18, 94.7%)
- Single (*n* = 1, 5.3%)

Residence:

- Small-Sized City (*n* = 3, 15.8%)
- Medium-Sized City (*n* = 15, 78.9%)
- Large City (*n* = 1, 5.3%)

Note. [a] Two studies were reported in two articles each. [b] De facto means living together in a marriage like arrangement and is equivalent to common law in some other countries. [c] A Levels is equivalent to completion of secondary education (i.e., High School). MSc = Master of Science. PhD = Doctorate of Philosophy. GCSE = General Certificate of Secondary Education.

Appendix X

Table 3

Summary of Tools (n = 56) Used According to Constructs Measured

Domain	Instrument	Number of Items Used in Reviewed Studies	Psychometric Properties in Reviewed Studies Cronbach's Alpha (α)	Number of Studies Used Instrument
Psychological				
	General Health Questionnaire (GHQ) 4 Subscales: Somatic Symptoms, Anxiety & Insomnia, Social Dysfunction, and Severe Depression (Goldberg & Hillier, 1979).	28	Not Reported (Boyce et al., 2007; Condon et al., 2004; Matthey et al., 2000)	02
	Hopkins Symptom Checklist (HSCL) 8 Factors: Somatization, Phobic Anxiety, Retarded Depression, Agitated Depression, Obsessive-Compulsive, Interpersonal Sensitivity, Anger-Hostility, & Psychoticism (Lipman, 1979).	90	Not Reported (Boyce et al., 2007; Condon et al., 2004)	01
	Self-Assessment of Irritability Scale (SAIS)	08	Not Reported	01

4 Subscales (*n* = 18 items): Depression Scale, Anxiety Scale, Outwardly Directed Irritability Scale, & Inwardly Directed Irritability Scale (Snaith et al., 1978).	(2 subscales were used: inwardly & outwardly directed irritability scales)	(Boyce et al., 2007; Condon et al., 2004)	
Edinburgh Postnatal Depression Scale (EPDS)	10	α = 0.87 (Chhabra et al., 2022) English Version, α = 0.82 to 0.84 & French Version, α = 0.79 to 0.6 (Da Costa et al., 2019) α = 0.83 (Mao et al., 2011a) Not Reported (Bergström, 2013; Boyce et al., 2007; Buist et al., 2003; Castle et al., 2008; Condon et al., 2004; Da Costa et al., 2017; Matthey et al., 2000; Zhang et al., 2016)	09
Parenting / Parental Stress Scale (PSS) Components:	18	2 & 6 months postpartum: English, α = 0.87 at both timepoints &	01

Positive & Negative Aspects of Parenting (Berry, 1995)		French, α = 0.81 & 0.87 (Da Costa et al., 2019)	
Perceived Stress Scale (PSS)			03
2 Factors: Helplessness & Self-Efficacy (Liu et al., 2020)	10	α = 0.77 (Mao et al., 2011b; Wang & Chen, 2006)	
2 Factors: Helplessness & Self-Efficacy (Liu et al., 2020).	14 (Chinese Perceived Stress Scale)	α = 0.82 (Lu et al., 2012)	
Beck Depression Inventory – Short Form (BDI-SF)	11	Not Reported (Buist et al., 2003)	03
Beck Depression Inventory (BDI)	21	Not Reported (Wang & Chen, 2006)	
Beck Depression Inventory (BDI) 2 Components: Cognitive & Affective	Not Reported (Matthey et al., 2000)		
Cambridge Worry Scale	02 Questions (Bergström, 2013)	Not Reported (Bergström, 2013)	01
Life Event Scale (brief version)	27	Not Reported (Boyce et al., 2007)	01

	Not Reported (Boyce et al., 2007)		
Positive and Negative Affect Scale (PANAS) 2 Subscales: Positive Affect Scale (PANAS-P) & Negative Affect Scale (PANAS-N)	Not Reported (Buist et al., 2003)	Internal Consistency for PANAS-P: α = 0.86 to 0.90 & for PANAS-N: α = 0.84 to 0.87 & Test-Retest Reliability for PANAS-P: maximum of 0.68 & for PANAS-N: maximum of 0.71 (Buist et al., 2003)	02
	20	Not Reported (Condon et al., 2004)	
State Anger & Anxiety Scales 2 Subscales: Anger Scale & Anxiety Scale	20 (Buist et al., 2003)	Internal Consistency for Anger Scale: α = 0.88 & for Anxiety Scale: α = 0.94 (Buist et al., 2003)	01
Mental Health Inventory (MHI-5)	05	Not Reported (Condon et al., 2004)	01
Life Stress Event Scale		Not Reported (Da Costa et al., 2017)	01
Attitudes towards Emotional Expression (AEE)	04 (Castle et al., 2008)	Not Reported (Castle et al., 2008)	01

	Hospital Anxiety and Depression Scale (HADS) 2 Components Anxiety & Depression	14	Not Reported (Castle et al., 2008)	01
	Well-Being Questionnaire (WBQ) 3 Subscales: Depression, Anxiety, & Positive Well-Being	18	Not Reported (Castle et al., 2008)	01
	SF-36 Health Survey – Mental Health Scale	05	Not Reported (Gjerdingen & Center, 2003)	01
	Center for Epidemiological Studies – Depression Scale (CES-D)	12 (Leathers & Kelley, 2000)	Pregnancy: $\alpha = 0.82$ & 4-Months Postpartum: $\alpha = 0.71$ (Leathers & Kelley, 2000)	01
	Everyday Stressors Index (ESI) – Modified for Use 5 Dimensions: Financial Concerns, Role Overload, Employment Issues, Parenting Concerns, & Interpersonal Conflicts	20	Not Reported (Pollock et al., 2005)	01
Substance Abuse				
	Alcohol Use Disorders Identification Test (AUDIT)	10	Not Reported	01

			(Boyce et al., 2007; Condon et al., 2004)	
	CAGE (acronym) ('C' for Cutdown, 'A' for Annoyed, 'G' for Guilty, & 'E' for Eye-opener)	04	Not Reported (Boyce et al., 2007)	01
Personality				
	Eysenck Personality Questionnaire (EPQ) 4 Subscales: Psychoticism, Extraversion, Neuroticism, & Lie (Helmes, 1980).	(Not Reported which version was used; long or short)	Not Reported (Boyce et al., 2007)	01
	Defense Style Questionnaire (DSQ) 3 Factors (*n* = 40 items & 20 defenses): Mature Factor (sublimation, humor, anticipation, & suppression), Neurotic Factor (undoing, pseudo-altruism, idealization, & reaction formation), and Immature Factor (projection, passive aggression, acting out, isolation, devaluation, autistic fantasy, denial, displacement, dissociation, splitting, rationalization, & somatization) (Gavin, 1993).	(Not Reported which version was used; original or revised)	Not Reported (Boyce et al., 2007)	01
	Bem Sex-Role Inventory (BSRI) 3 Characteristics (*n* = 60 items): Masculinity, Femininity, & Androgny (Bem, 1974).	Not Reported	Not Reported (Boyce et al., 2007)	01

Relationship			
	Dyadic Adjustment Scale (DAS)		04
	Agreement / Disagreement Between Couple, Frequency of An Event Between Couple, & Degree of Happiness in Couple's Relationship	07	α = 0.90 (Buist et al., 2003)
	Agreement / Disagreement Between Couple, Frequency of An Event Between Couple, & Degree of Happiness in Couple's Relationship	07	α = 0.83 (Chhabra et al., 2022)
	4 Subscales: (Consensus, Affectional Expression, Satisfaction, & Dyadic Cohesion)	32	English, α = 0.90 to 0.92 & French, α = 0.91 to 0.93 (Da Costa et al., 2019)
	4 Subscales: (Consensus, Affectional Expression, Satisfaction, & Dyadic Cohesion)	32	Not Reported (Boyce et al., 2007; Condon et al., 2004; Da Costa et al., 2017)
	Intimate Bond Measure (IBM)		02
	2 Subscales: Perceived Caring & Sense of Control in Intimate Relationship	20	Internal Consistency: α = 0.89 to 0.94 & Test-Retest Reliability: 0.8. to 0.89 (Buist et al., 2003)
	2 Subscales:		

Perceived Caring & Sense of Control in Intimate Relationship	24	Not Reported (Boyce et al., 2007; Condon et al., 2004)	
Kansas Marital Satisfaction Scale (KMSS) 03 items on Marital Satisfaction (Nichols, 1983).	01	Not Reported (Gjerdingen & Center, 2003; Zhang et al., 2016)	02
Parental Bonding Instrument (PBI) 2 Factors (n = 17 items): Parental Care & Overprotection (Parker et al., 1979).	Not Reported	Not Reported (Boyce et al., 2007)	01
Intimate Bond Measure (IBM)	24	Not Reported (Boyce et al., 2007; Condon et al., 2004)	01
Intimate Bond Questionnaire 2 Subscales: Perceived Caring & Sense of Control	20	Internal Consistency: α = 0.89 to 0.94 & Test-Retest Reliability: α = 0.80 to 0.89 (Buist et al., 2003)	01
Barnett Scale	15 Statements (Bergström, 2013)	Not Reported (Bergström, 2013)	01
Paternal Antenatal Attachment Scale	Not Reported (Boyce et al., 2007)	Not Reported (Boyce et al., 2007)	01

	Paternal Postnatal Attachment Scale 3 Subscales: Quality of Attachment, Absence of Hostility, & Pleasure in Interaction	19	Not Reported (Buist et al., 2003)	01
	ROSS Scale 3 Items: Social Attachment, Marital Status, and Social and Economic Support (Ross, 1995).	03	Pregnancy & Postpartum Consistency: $\alpha = 0.76$ or above & Reliability During Pregnancy: $\alpha = 0.71$ (Leathers & Kelley, 2000)	01
	Parenting Sense of Competence (PSOC) Scale 2 Subscales: Efficacy Subscale ($n = 8$ items) & Satisfaction Subscale ($n = 9$ items)	17	Not Reported (Zhang et al., 2016)	01
Physical				
	Pittsburgh Sleep Quality Index (PSQI) 7 Components: Subjective Sleep Quality, Sleep Latency, Sleep Duration, Habitual Sleep Efficiency, Sleep Disturbances, Use of Sleeping Medication, & Daytime Dysfunction	19	Not Reported (Da Costa et al., 2017) English, $\alpha = 0.58$ to 0.65 & French, $\alpha = 0.51$ to 0.65 (Da Costa et al., 2019)	01
	International Physical Activity Questionnaire – Short Form (IPAQ)	Not Reported	Not Reported (Da Costa et al., 2017)	01

	3 Categories: Low Activity, Moderate Activity, & High Level of Physical Activity			
	Global Sleep Assessment Questionnaire (GSAQ)	11	α = 0.92 (Chhabra et al., 2022)	01
	SF-36 Health Survey	05 (Gjerdingen & Center, 2003)	Not Reported (Gjerdingen & Center, 2003)	01
	National Health Interview Survey – Days Ill	04 (Gjerdingen & Center, 2003)	Not Reported (Gjerdingen & Center, 2003)	01
Social				
	Medical Outcomes Study Social Support Survey (MOS-SS) 3 Domains: Emotional, Tangible, & Affectionate	07 (Short Version)	Not Reported (Da Costa et al., 2017) English, α = 0.90 to 0.92 & French, α = 0.89 to 0.92 (Da Costa et al., 2019)	01
	Sarason Social Support Survey (SSSS)	12	Not Reported (Boyce et al., 2007)	01
	Sarason's Social Support Questionnaire – Short Form (SSQ)	12	Not Reported (Condon et al., 2004)	

DUKE-UNC Functional Social Support Questionnaire (FSSQ) 2 Subscales: Confidant Support & Affective Support	08	Not mentioned explicitly whether the reported psychometric properties were measured for this study or reported from the scale-development study (Castle et al., 2008)	01
Social Support 3 Types: Need for Social Support, Need for Advice, & Need for Tangible Support	03	Internal Consistency: $\alpha = 0.67$ (Leathers & Kelley, 2000)	01
Cohen's Dimensions of Social Support Scale	Not Reported (Gjerdingen & Center, 2003)	Not Reported (Gjerdingen & Center, 2003)	01
Social Support Rating Scale (SSRS) 3 Dimensions: Subjective Support, Objective Support, & Social Support Availability	10	$\alpha = 0.73$ (Mao et al., 2011a)	01
Interpersonal Support Evaluation List (ISEL) – Short Form 4 Dimensions:	16 Statements	Not Reported (Wang & Chen, 2006)	01

	Tangible Aid, Appraisal, Self-Esteem, & Belonging			
Gender Role				
	Masculine Gender Role Stress (MGRS) Scale	Not Reported (Buist et al., 2003)	Internal Consistency: $\alpha = 0.79$ & Test-Retest Reliability: $\alpha = 0.82$ (Buist et al., 2003)	02
		40 (Chhabra et al., 2022)	$\alpha = 0.98$ (Chhabra et al., 2022)	
Quality of Life				
	World Health Organization Quality of Life (WHOQOL) Domains Used: Physical, Psychological, Social, Relationships, & Overall Quality of Life	Not Reported (Condon et al., 2004)	Not Reported (Condon et al., 2004)	01
	World Health Organization Quality of Life (WHOQOL) Subscale: Sexual Satisfaction	04	Not Reported (Condon et al., 2004)	01
	Global Quality of Life (QOL)	Not Reported	Not Reported (Gjerdingen & Center, 2003)	01
Financial				

	Financial Stress	04	Not Reported (Da Costa et al., 2017)	01
	4 Components: Financial Situation, Income Adequacy, Debt, and Saving & Investment		English, α = 0.74 to 0.80 & French, α = 0.80 to 0.83 (Da Costa et al., 2019)	
Inter-Role				
	Work-Family Conflict (WFC) Scale	10	Work-Family Conflict: α = 0.92 & Family-Work Conflict: α = 0.94 (Chhabra et al., 2022)	01
	2 Subscales: Work-Family Conflict & Family-Work Conflict			
Family				
	National Survey of Family Growth – Pregnancy Intendedness		Not Reported (Leathers & Kelley, 2000)	01
	Family Assessment Device–General Function (FAD-GF) Scale	12	α = 0.85 (Lu et al., 2012)	01
	Family Resources Scale	13	α = 0.88 (Lu et al., 2012)	01
	Family Adaptation Scale (During Postpartum Period)	24	α = 0.89 (Lu et al., 2012)	01
Self-Esteem				
	Coopersmith Self-Esteem Inventory (SEI)	Not Reported	Not Reported (Wang & Chen, 2006)	01

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Appendix Y

Table 4

Distribution of Risk Factors' Domains (n = 12) According to the Included Studies (n = 16)

Domain	References	# of Studies
Psychological	(Bergström, 2013; Boyce et al., 2007; Buist et al., 2003; Castle et al., 2008; Chhabra et al., 2022; Condon et al., 2004; Da Costa et al., 2017, 2019; Gjerdingen & Center, 2003; Leathers & Kelley, 2000; Lu et al., 2012; Mao et al., 2011; Matthey et al., 2000; Pollock et al., 2005; Wang & Chen, 2006; Zhang et al., 2016)	14
Relationship	(Bergström, 2013; Boyce et al., 2007; Buist et al., 2003; Chhabra et al., 2022; Condon et al., 2004; Da Costa et al., 2017, 2019; Gjerdingen & Center, 2003; Leathers & Kelley, 2000; Zhang et al., 2016)	08
Social	(Boyce et al., 2007; Castle et al., 2008; Condon et al., 2004; Da Costa et al., 2017, 2019; Gjerdingen & Center, 2003; Leathers & Kelley, 2000; Mao et al., 2011; Wang & Chen, 2006)	07
Physical	(Chhabra et al., 2022; Da Costa et al., 2017, 2019; Gjerdingen & Center, 2003)	03
Gender Role	(Buist et al., 2003; Chhabra et al., 2022)	02
Quality of Life	(Condon et al., 2004; Gjerdingen & Center, 2003)	02
Family	(Leathers & Kelley, 2000; Lu et al., 2012)	02
Substance Abuse	(Boyce et al., 2007; Condon et al., 2004)	01
Personality	(Boyce et al., 2007)	01
Financial	(Da Costa et al., 2017, 2019)	01
Inter-Role	(Chhabra et al., 2022)	01
Self-Esteem	(Wang & Chen, 2006)	01

Note. Two studies reported in four papers i.e., Boyce et al., 2007 & Condon et al., 2004, are same study and Da Costa et al., 2017, & Da Costa et al., 2019, are same study.

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Appendix Z

Supplemental Table 1

PCC Framework for Eligibility Criteria

Population (P)	Concept (C)	Context (C)
Inclusion Criteria: • Biological father • First-time father • Opposite-sex couple • Free and full-text articles • Articles published in English language. • Articles published from January 01, 2000, till to date. • Any type of published research or study. Exclusion Criteria: • Men suffering from anxiety, before expecting a baby. • Men suffering from clinical depression, before expecting a baby. • Men going through psychological distress, before expecting a baby.	Inclusion Criteria: • Psychological distress • Perinatal (antenatal, intrapartum, postnatal) • Any outcome of pregnancy • Any outcome of delivery • Any result of Anomaly Scan	Inclusion Criteria: • Sex-based • Any region in the world

Appendix AA

Supplemental Table 2

Search Term

Concept	First-time Father	Anxiety	Depression	Psychological Distress	Psychosocial Factors	Risk Factors
Substitutes	• firsttime fathers • first-time fathers • new fathers • firsttime expect* men • first-time expect* men • new expect* men • firsttime expect* fathers • first-time expect* fathers • new expect* fathers • paternal	• anxi* • uneas* • nervous* • worr* • fear* • apprehensi* • concern*	• depress* • sad • sadness • misery • hopeless* • unhapp* • sorrow • grief • blue	• psychological distress • stress	• psychosocial factors • psychosocial impacts • psychosocial effects	• risk factors • contributing factors • influencing factors • predisposing factors • predictors • cause

Appendix AB

Supplemental Table 3

Definition of Constructs and Subscales

Domain / Theory	Instrument	Construct / Subscale	Definition of Construct / Subscale
Psychological			
	General Health Questionnaire (GHQ)	4 Subscales: Somatic Symptoms, Anxiety & Insomnia, Social Dysfunction, & Severe Depression (Goldberg & Hillier, 1979).	Not reported
	Hopkins Symptom Checklist (HSCL) 8 Factors: Somatization, Phobic Anxiety, Retarded Depression, Agitated Depression, Obsessive-Compulsive, Interpersonal Sensitivity, Anger-Hostility, & Psychoticism (Lipman, 1979).	Somatization	"The items comprising this dimension reflect distress arising from perceptions of bodily dysfunction. Complaints focused on cardiovascular, gastrointestinal, respiratory, and other systems with marked auto-nomic medication are included. Headaches, pain and discomfort localized in the gross musculature and other somatic equivalents of anxiety are also represented" (Derogatis et al., 1974).

	Obsessive-Compulsive	"The items that form this dimension reflect symptoms that are closely identified with the clinical syndrome of this name. This dimension focuses on thoughts, impulses, and actions that are experienced as unremitting and irresistible by the individual but are of an ego-alien or unwanted nature. Behaviors indicative of a more general cognitive difficulty also load on this measure" (Derogatis et al., 1974).
	Interpersonal Sensitivity (IS)	"The symptoms that are fundamental to IS. focus on feelings of personal inadequacy and inferiority, particularly in comparison to other persons. Self-depreciation, feelings of uneasiness, and marked discomfort. During interpersonal interactions are characteristic manifestations, as are acute self-consciousness and negative expectancies regarding interpersonal communications" (Derogatis et al., 1974).
Self-Assessment of Irritability Scale (SAIS) 4 Subscales: Depression Scale, Anxiety Scale, Outwardly Directed Irritability	Irritability	Irritability is a temporary psychological state, characterized by impatience, intolerance, and poorly controlled anger (Snaith et al., 1978).

Scale, & Inwardly Directed Irritability Scale (Snaith et al., 1978).	Outwardly Directed Irritability	Irritability can be expressed outwardly, toward others (Snaith et al., 1978).
	Inwardly Directed Irritability	Irritability can be directed inwardly, toward oneself (Snaith et al., 1978).
Edinburgh Postnatal Depression Scale (EPDS)	Postnatal Depression	Depression following childbirth. (Cox et al., 1987).
Parenting / Parental Stress Scale (PSS)	Components: Positive & Negative Aspects of Parenting (Berry, 1995).	Not reported
Perceived Stress Scale (PSS)	Perceived Stress	"---situations in one's life are appraised as stressful". (Cohen et al., 1983).
	2 Factors: Helplessness & Self-Efficacy (Liu et al., 2020).	Not reported
Beck Depression Inventory – Short Form (BDI-SF)	Depression	Not reported in Beck (1961) article (Beck et al., 1961).
2 Components: Cognitive & Affective		
Cambridge Worry Scale	Worry	"…as a normal everyday activity rather than in pathology" (Green et al., 2003).
Life Event Scale (brief version)	Life Change Scaling	"Capacity to produce a change in life style" (Tennant & Andrews, 1976).

2 Subscales: Distress Scaling & Life Change Scaling (Tennant & Andrews, 1976).	Distress Scaling	"Capacity to produce emotional distress" (Tennant & Andrews, 1976).
Positive and Negative Affect Scale (PANAS) 2 Subscales: Positive Affect Scale (PANAS-P) & Negative Affect Scale (PANAS-N)	Positive Affect (PA)	"PA reflects the extent to which a person feels enthusiastic, active, and alert" (Watson et al., 1988).
	Negative Affect (NA)	"NA is a general dimension of subjective distress and unpleasurable engagement that subsumes a variety of aversive mood states, including anger, contempt, disgust, guilt, fear, and nervousness…". (Watson et al., 1988).
State Anger & Anxiety Scales 2 Subscales: Anger Scale & Anxiety Scale	State Anxiety	"State Anxiety has been defined as a transitory feeling of tension and apprehension; it may fluctuate over time and can vary in intensity" (Vigneau & Cormier, 2008).
	Anger	"Psychobiological emotional state or condition that consists of feelings that vary in intensity from mild irritation or annoyance to intense fury and rage, accompanied by activation of neuroendocrine processes and arousal of the autonomic nervous system" (Utreja & Rizvi, 2019).

Mental Health Inventory (MHI-5)	4 Subscales: Anxiety, Depression, Behavioral / Emotional Control, & General Positive Affect (Berwick et al., 1991)	Not reported
Life Stress Event (LSE) Scale	Life Stress Event	"Stressfulness of a life event arises from the readjustment, either positive or negative, that is required to adapt to the occurrence of the life event per se" (Hurst et al., 1978).
Attitudes towards Emotional Expression (AEE)	4 Factors: Beliefs about meaning: that expression of emotions is a sign of weakness; beliefs about expression: that emotions should be kept under-control; beliefs about consequences: that other people will be rejecting / social rejection; & behavioral tendencies: tendency to express emotions (Joseph et al., 1994; Laghai & Joseph, 2000).	
Hospital Anxiety and Depression Scale (HADS)	2 Components: Anxiety & Depression	Not reported in Zigmond and Snaith (1983) article (Zigmond & Snaith, 1983).

	Well-Being Questionnaire (WBQ)	3 Subscales: Depression, Anxiety, & Positive Well-Being	Unable to retrieve
	SF-36 Health Survey – Mental Health Scale		Not reported
	Center for Epidemiological Studies – Depression Scale (CES-D)	Items (n = 12) (Leathers & Kelley, 2000)	Not reported in Weissman (1977) and Orr (1997) articles (Orr & Arden Miller, 1997; Weissman et al., 1977).
	Everyday Stressors Index (ESI) – Modified for Use	5 Dimensions: Financial Concerns, Role Overload, Employment Issues, Parenting Concerns, & Interpersonal Conflicts	Not reported in Hall (1990) article (Hall, 1990).
Substance Abuse			
	Alcohol Use Disorders Identification Test (AUDIT)		"…hazardous or harmful alcohol consumption" (Saunders et al., 1993).
	CAGE	Acronym	"CAGE questions focus on Cutting down, Annoyance by criticism, Guilty feeling, and Eye-openers" (Ewing, 1984).
Personality			
	Eysenck Personality Questionnaire (EPQ)	Neuroticism	"a trait opposite to emotional stability & defines the degree to which a person is disposed to experience

4 Subscales: Psychoticism, Extraversion, Neuroticism, & Lie (Helmes, 1980).		negative affect… Individuals will high levels of this trait tend to be worried, apprehensive, moody, fed-up, and irritable" (Colledani et al., 2018).
	Extraversion	"this trait is opposite to introversion, which, in contrast, defines individuals introspective, quiet, serious, and reserved' (Colledani et al., 2018).
	Psychoticism or Toughmindedness	"…typical toughminded is an individual hostile, aggressive, untrusting, cold, unemotional, rude, lacking in human feelings, and unfriendly" (Colledani et al., 2018).
	Lie	"…dissimulation and the tendency to deceive" (Colledani et al., 2018).
Defense Style Questionnaire (DSQ)	Mature Factor	"Sublimation, humor, anticipation, & suppression" (Gavin, 1993).
3 Factors (*n* = 40 items & 20 defenses): Mature Factor, Neurotic Factor and Immature Factor (Gavin, 1993).	Neurotic Factor	"Undoing, pseudo-altruism, idealization, & reaction formation" (Gavin, 1993).
	Immature Factor	"Projection, passive aggression, acting out, isolation, devaluation, autistic fantasy, denial, displacement, dissociation, splitting,

			rationalization, & somatization" (Gavin, 1993).
	Bem Sex-Role Inventory (BSRI)		
	3 Characteristics (n = 60 items): Masculinity, Femininity, & Androgyny (Bem, 1974).	Femininity	The first three highest and commonly ranked feminine attributes are: loves children, sympathetic, and sensitive to needs of others (Capurso & Blocher, 1985).
		Masculinity	The first three highest ranked masculine attributes are: ambitious, assertive, and athletic" (Capurso & Blocher, 1985).
		Androgyny	"…a balance between masculine and feminine characteristics" (Downing, 1979).
Relationship			
	Dyadic Adjustment Scale (DAS) 4 Subscales: Consensus, Affectional Expression, Satisfaction, & Dyadic Cohesion	Dyadic Adjustment	"… dyadic adjustment can be defined as a process, the outcome of which is determined by the degree of: (1) troublesome dyadic differences; (2) interpersonal tensions and personal anxiety; (3) dyadic satisfaction; (4) dyadic cohesion; and (5) consensus on matters of importance to dyadic functioning." (Spanier, 1976).
	Intimate Bond Measure (IBM)	Intimate	"The word 'intimate' refers to our intent to measure the contribution made by

2 Subscales: Perceived Caring & Sense of Control in Intimate Relationship		individuals' partners or their putative 'intimates'." (Wilhelm & Parker, 1988).
	Care	"The 'care' dimension... reflects care expressed emotionally as well as physically, with constructs of warmth, consideration, affection and companionship." (Wilhelm & Parker, 1988).
	Control	"The 'control' dimension suggests domination, intrusiveness, criticism, authoritarian attitudes and behaviours." (Wilhelm & Parker, 1988).
Kansas Marital Satisfaction Scale (KMSS)	03 items on Marital Satisfaction (Nichols, 1983).	Not reported
Parental Bonding Instrument (PBI) 2 Factors (*n* = 17 items): Parental Care & Overprotection (Parker et al., 1979).	Care	"The first derived factor … involved one pole defined by affection, emotional warmth, empathy, and closeness, and the other by emotional coldness, indifference, and neglect. Its items appeared to measure the presence or absence of care…" (Parker et al., 1979).
	Overprotection	"The second factor has one pole defined by control, overprotection, intrusion, excessive contact,

		infantilization and prevention of independent behavior, and the other defined by items that suggest allowance of independence and autonomy" (Parker et al., 1979).
Intimate Bond Questionnaire 2 Subscales: Perceived Caring & Sense of Control	Intimacy	"…intimacy is a process occurring over time, and that individuals have different needs for intimacy, which they hold 'is never complete or fully accomplished'." (Wilhelm & Parker, 1988).
Barnett Scale		Not reported
Paternal Antenatal Attachment Scale	Attachment	"… defines attachment as an 'emotional tie' or 'psychological bond' to a specific object (Condon, 1993).
Paternal Postnatal Attachment Scale 3 Subscales: Quality of Attachment, Absence of Hostility, & Pleasure in Interaction	Postnatal	"… during first year of life" (Condon & Corkindale, 1998).
ROSS Scale 3 Items: Social Attachment, Marital Status, and Social and Economic Support (Ross, 1995).	Social Attachment	"Social attachments are defined here as a sequence of increasing commitments in adult relationships" (Ross, 1995).
	Social Support	"The person believes he or she is cared for and loved, is esteemed and valued, and belongs to a network of

			communication and mutual obligation in which others can be counted on" (Ross, 1995).
	Parenting Sense of Competence (PSOC) Scale 2 Subscales: Efficacy & Satisfaction		This scale was developed by Gibaud-Wallstaon for her PhD dissertation, and presented at the American Psychological Association in August 1978, in Toronto, Canada. This scale consists of 17 items (Gibaud-Wallston & Wandersman, 1978).
Physical			
	Pittsburgh Sleep Quality Index (PSQI) 7 Components: Subjective Sleep Quality, Sleep Latency, Sleep Duration, Habitual Sleep Efficiency, Sleep Disturbances, Use of Sleeping Medication, & Daytime Dysfunction	Sleep Quality	"Sleep quality includes quantitative aspects of sleep, such as sleep duration, sleep latency, or number of arousals, as well as more purely subjective aspects, such as "depth" or "restfulness" of sleep." (Buysse et al., 1989).
	International Physical Activity Questionnaire – Short Form (IPAQ) 3 Categories: Low Activity, Moderate Activity, & High Level of Physical Activity	http://www.ipaq.ki.se/	Hyperlink is broken. Unable to retrieve.
	Global Sleep Assessment Questionnaire (GSAQ)		Not reported
	SF-36 Health Survey		Not reported

	National Health Interview Survey – Days Ill		Unable to retrieve
Social			
	Medical Outcomes Study Social Support Survey (MOS-SS) 5 Dimensions: Emotional, Informational, Tangible, Affectionate, & Positive Social Interaction (Merino-Soto et al., 2023).	Emotional Support	"the expression of positive affect, empathetic understanding, and the encouragement of expressions of feelings" (Sherbourne & Stewart, 1991).
		Informational Support	"the offering of advice, information, guidance, or feedback" (Sherbourne & Stewart, 1991).
		Tangible	"the provision of material aid or behavioral assistance" (Sherbourne & Stewart, 1991).
		Affectionate	"involving expressions of love and affection" (Sherbourne & Stewart, 1991).
		Positive Social Interaction	"the availability of other persons to do fun things with you" (Sherbourne & Stewart, 1991).
	Sarason Social Support Survey (SSSS) Sarason's Social Support Questionnaire – Short Form (SSQ)	Social Support	"… perception of being loved and valued is central in the concept of social support,,," (Sarason, 1987).
		2 Elements / Factors	"Social support would seem to have two basic elements: (a) the perception

		that there is a sufficient number of available others to whom one can turn in times of need, and (b) a degree of satisfaction with the available support." (Sarason et al., 1983).
DUKE-UNC Functional Social Support Questionnaire (FSSQ) 2 Subscales: Confidant Support & Affective Support	Confidant Support	"Confidant Support, which reflects primarily a confidant relationship where important matters in life are discussed and shared" (Broadhead et al., 1988).
	Affective Support	"Affective Support, which reflects a more emotional form of support or caring" (Broadhead et al., 1988).
Social Support 3 Types: Need for Social Support, Need for Advice, & Need for Tangible (Instrumental) Support	Social Support	"The term social support has been used to denote those personal aspects of social relationships thought to confer a beneficial effect on physical and psychological health… Although social support was not specifically assessed the importance of the quality of family functioning can be thought of as part of the concept." (Brugha, 1989).
Cohen's Dimensions of Social Support Scale	Social Supports	"By social supports, we mean the resources that are provided by other persons" (Sarason & Sarason, 1985).

3 Components: Emotional Support, Tangible Support, & Informational Support	Emotional Support	"Emotional support includes intimacy and attachment, reassurance, and being able to confide in and rely on another – all of which contribute to the feeling that one is loved or cared about, or even that one is a member of the group, not a stranger" (Schaefer et al., 1981).
	Tangible Support	"Tangible support involves direct aid or services and can include loans, gifts of money or goods, and provision of services such as taking care of needy persons or doing a chore for them" (Schaefer et al., 1981).
	Informational Support	"Informational support includes giving information and advice which could help a person solve a problem and providing feedback about how a person is doing" (Schaefer et al., 1981).
Social Support Rating Scale (SSRS)		Unable to retrieve
3 Dimensions: Subjective Support, Objective Support, & Social Support Availability		
Interpersonal Support Evaluation List (ISEL) – Short Form	Tangible Subscale	"The "tangible" subscale is intended to measure perceived ability of material aid" (Sarason & Sarason, 1985).

	4 Subscales: Tangible Aid, Appraisal, Self-Esteem, & Belonging	Appraisal Subscale	"…perceived ability of someone to talk to about one's problems" (Sarason & Sarason, 1985).
		Self-Esteem Subscale	"perceived ability of a positive comparison when comparing one's self with others" (Sarason & Sarason, 1985).
		Belonging Subscale	"perceived ability of people one can do things with" (Sarason & Sarason, 1985).
Gender Role			
	Masculine Gender Role Stress (MGRS) Scale 5 Factors: Physical Inadequacy, Emotional Inexpressiveness, Subordination to Women, Intellectual Inferiority, & Performance Failure (Eisler & Skidmore, 1987).	Masculine Gender Role Stress	"The concept of masculine gender role stress… refers to the cognitive appraisal of specific situations as stressful for men. These situations include the individual's thoughts and behaviors, as well as environmental events." (Eisler & Skidmore, 1987).
		Physical Inadequacy	"Physical Inadequacy is made up of items that reflect an inability to meet masculine standards of physical fitness, sexual prowess, and "manly" appearances" (Eisler & Skidmore, 1987).
		Emotional Inexpressiveness	"Emotional Inexpressiveness reflects situations that require the

			expression of "tender" emotions. Items include the expression of love, fear, and hurt feelings, as well as being seen crying" (Eisler & Skidmore, 1987).
		Subordination to Women	"Items that constitute this factor place one in the position of being outperformed by women (at work or in a game), having a female boss, letting a woman take control, or being with women who are more successful or who make more money" (Eisler & Skidmore, 1987).
		Intellectual Inferiority	"Intellectual Inferiority by clustering on situations that question one's rational abilities or demonstrate uncertainty, lack of ambition, and indecisiveness" (Eisler & Skidmore, 1987).
		Performance Failure	"Performance Failure concerns potential failures in two different spheres, work and sex." (Eisler & Skidmore, 1987).
Quality of Life			
	World Health Organization Quality of Life (WHOQOL) 6 Domains (n = 24 Facets): Physical, Psychological, Level of Independence,	Quality of Life	"Quality of life was defined as individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their

Social Relationships, Environment, Spirituality / Religion / Personal Beliefs, and Overall Quality of Life & General Health Perceptions Overall Quality of Life & General Health: 24 Facets (*n* = 100 Items): Pain & Discomfort; Energy & Fatigue; Sleep & Rest; Positive Feelings; Thinking, Learning, Memory & Concentration; Self-Esteem; Bodily Image & Appearance; Negative Feelings; Mobility; Activities of Daily Living; Dependence on Medication or Treatments; Working Capacity; Personal Relationships; Social Support; Sexual Activity; Physical Safety & Security; Home Environment; Financial Resources; Health & Social Care: Availability & Quality; Opportunities for Acquiring New Information & Skills; Participation In & New Opportunities for Recreating / Leisure; Physical Environment: (Pollution / Noise / Traffic / Climate); Transport; Spirituality / Religion / Personal Beliefs		goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the persons' physical health, psychological state, level of independence, social relationships and their relationship to salient features of their environment" (The Whoqol Group, 1998).
Global Quality of Life (QOL)	Global QOL	"…is the person's overall judgement of their quality of life" (Hyland & Sodergren, 1996).

		Global QOL	"…a value-dependent overall judgement made by the subject of all the different aspects of what the subject means by QOL" (Hyland & Sodergren, 1996).
Financial			
	Financial Stress 4 Components: Financial Situation, Income Adequacy, Debt, and Saving & Investment	Financial Stress	"Financial stress is conceptualized as the subjective perception of one's personal finances" (Kim & Garman, 2003).
Inter-Role			
	Work-Family Conflict (WFC) Scale 2 Subscales: Work-Family Conflict & Family-Work Conflict	Work-to-Family Conflict	"…work negatively impacting family…" (Haslam et al., 2015).
		Family-to-Work Conflict	"…family engagement negatively impacting work…" (Haslam et al., 2015).
Family			
	National Survey of Family Growth – Pregnancy Intendedness	Unintended Pregnancies	"Unintended pregnancies include both those that are unwanted (i.e., a baby is not wanted at any time) and those that are mistimed (i.e., a baby is wanted eventually, but not until a later time)" (Kaufmann et al., 1997).
		Intended Pregnancies	"Intended pregnancies are defined as those that are conceived when a

		baby is desired. Both mistimed and intended pregnancies are considered wanted" (Kaufmann et al., 1997).
Family Assessment Device–General Function (FAD-GF) Scale	FAD	"…it measures people's perceptions of their families" (Epstein et al., 1983).
7 Subscales: Problem-Solving, Communication, Roles, Affective Responsiveness, Affective Involvement, Behavior Control, and General Functioning (Epstein et al., 1983).	Problem-Solving	"Problem Solving… refers to the family's ability to resolve problems (issues which threaten the integrity and functional capacity of the family) at a level that maintains effective family functioning" (Epstein et al., 1983).
	Communication	"…is defined as the exchange of information among family members" (Epstein et al., 1983).
	Roles	"…focuses on whether the family has established patterns of behavior for handling a set of family functions which include provision of resources, providing nurturance and support, supporting personal development, maintaining and managing the family systems and providing adult sexual gratification… whether tasks are clearly and equitably assigned to family members and whether tasks are carried out responsibly by

		family members" (Epstein et al., 1983).
	Affective Responsiveness	"Affective Responsiveness assesses the extent to which individual family members are able to experience appropriate affect over a range of stimuli. Both welfare and emergency emotions are considered" (Epstein et al., 1983).
	Affective Involvement	"Affective Involvement is concerned with the extent to which family members are interested in and place value on each other's activities and concerns.
	Behavior Control	"…assessed the way in which a family expresses and maintains standards for the behavior of its members.
	General Functioning	"General Functioning assesses the overall health / pathology of the family" (Epstein et al., 1983).
Family Resources Scale (FRS)	Family Resources Scale	"FRS assesses the adequacy of resources across several areas of family functioning, including physical necessities and health, personal and financial resources, and intra-family support" (Dunst & Leet, 1987).
Family Adaptation Scale (During Postpartum Period)		Unable to retrieve

Self-Esteem			
	Coopersmith Self-Esteem Inventory (SEI) 4 Dimensions: Social, Academic, Family, and Personal Areas of Experience (Wang & Chen, 2006).	Self-Esteem	"In short, self-esteem is a personal judgement of worthiness that is expressed in the attitudes the individual holds toward himself. It is a subjective experience which the individual conveys to others by verbal reports and other overt expressive behavior." (Coopersmith, 1967).
		4 Dimensions: Social, Academic, Family, and Personal Areas of Experience	Unable to retrieve

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Appendix AC

Supplemental Table 4

Summary of Tools (n = 56) Used According to Four Layers of Socioecological Model (SEM) Framework

Domain	Instrument	SEM Layers	Number of Studies Used Instrument
Psychological			
	General Health Questionnaire (GHQ) 4 Subscales: Somatic Symptoms, Anxiety & Insomnia, Social Dysfunction, and Severe Depression (Goldberg & Hillier, 1979).	Individual	02
	Hopkins Symptom Checklist (HSCL) 8 Factors: Somatization, Phobic Anxiety, Retarded Depression, Agitated Depression, Obsessive-Compulsive, Interpersonal Sensitivity, Anger-Hostility, & Psychoticism (Lipman, 1979).	Individual	01
	Self-Assessment of Irritability Scale (SAIS) 4 Subscales (*n* = 18 items): Depression Scale, Anxiety Scale, Outwardly	Individual	01

Directed Irritability Scale, & Inwardly Directed Irritability Scale (Snaith et al., 1978).		
Edinburgh Postnatal Depression Scale (EPDS)	Individual	09
Parenting / Parental Stress Scale (PSS)	Individual	01
Components: Positive & Negative Aspects of Parenting (Berry, 1995)		
Perceived Stress Scale (PSS)	Individual	03
2 Factors: Helplessness & Self-Efficacy (Liu et al., 2020)		
Beck Depression Inventory – Short Form (BDI-SF)	Individual	03
2 Components: Cognitive & Affective		
Cambridge Worry Scale	Individual	01
Life Event Scale (brief version)	Individual	01
Positive and Negative Affect Scale (PANAS)	Individual	02
2 Subscales: Positive Affect Scale (PANAS-P) & Negative Affect Scale (PANAS-N)		

State Anger & Anxiety Scales	Individual	01
2 Subscales: Anger Scale & Anxiety Scale		
Mental Health Inventory (MHI-5)	Individual	01
Life Stress Event Scale	Individual	01
Attitudes towards Emotional Expression (AEE)	Individual	01
Hospital Anxiety and Depression Scale (HADS)	Individual	01
2 Components: Anxiety & Depression		
Well-Being Questionnaire (WBQ)	Individual	01
3 Subscales: Depression, Anxiety, & Positive Well-Being		
SF-36 Health Survey – Mental Health Scale	Individual	01
Center for Epidemiological Studies – Depression Scale (CES-D)	Individual	01
Everyday Stressors Index (ESI) – Modified for Use	Individual, Relationship, & Community	01
5 Dimensions: Financial Concerns, Role Overload, Employment Issues,		

	Parenting Concerns, & Interpersonal Conflicts		
Substance Abuse			
	Alcohol Use Disorders Identification Test (AUDIT)	Individual	01
	CAGE (acronym): 'C' for Cutdown, 'A' for Annoyed, 'G' for Guilty, & 'E' for Eye-opener	Individual	01
Personality			
	Eysenck Personality Questionnaire (EPQ)	Individual	01
	4 Subscales: Psychoticism, Extraversion, Neuroticism, & Lie (Helmes, 1980).		
	Defense Style Questionnaire (DSQ)	Individual	01
	3 Factors (*n* = 40 items & 20 defenses): Mature Factor (sublimation, humor, anticipation, & suppression), Neurotic Factor (undoing, pseudo-altruism, idealization, & reaction formation), and Immature Factor (projection, passive aggression, acting out, isolation, devaluation, autistic fantasy, denial, displacement, dissociation, splitting, rationalization, & somatization) (Gavin, 1993).		

	Bem Sex-Role Inventory (BSRI) 3 Characteristics (n = 60 items): Masculinity, Femininity, & Androgny (Bem, 1974).	Individual	01
Relationship			
	Dyadic Adjustment Scale (DAS) Agreement / Disagreement Between Couple, Frequency of An Event Between Couple, & Degree of Happiness in Couple's Relationship 4 Subscales: (Consensus, Affectional Expression, Satisfaction, & Dyadic Cohesion)	Relationship	04
	Intimate Bond Measure (IBM) 2 Subscales: Perceived Caring & Sense of Control in Intimate Relationship	Relationship	02
	Kansas Marital Satisfaction Scale (KMSS) 03 items on Marital Satisfaction (Nichols, 1983).	Relationship	02
	Parental Bonding Instrument (PBI)	Relationship	01

2 Factors (*n* = 17 items): Parental Care & Overprotection (Parker et al., 1979).		
Intimate Bond Measure (IBM)	Individual & Relationship	01
Intimate Bond Questionnaire 2 Subscales: Perceived Caring & Sense of Control	Individual & Relationship	01
Barnett Scale		01
Paternal Antenatal Attachment Scale	Individual	01
Paternal Postnatal Attachment Scale 3 Subscales: Quality of Attachment, Absence of Hostility, & Pleasure in Interaction	Individual & Relationship	01
ROSS Scale 3 Items: Social Attachment, Marital Status, and Social and Economic Support (Ross, 1995).	Relationship, Community, & Society	01
Parenting Sense of Competence (PSOC) Scale	Individual	01

	2 Subscales: Efficacy Subscale (n = 8 items) & Satisfaction Subscale (n = 9 items)		
Physical			
	Pittsburgh Sleep Quality Index (PSQI)	Individual	01
	7 Components: Subjective Sleep Quality, Sleep Latency, Sleep Duration, Habitual Sleep Efficiency, Sleep Disturbances, Use of Sleeping Medication, & Daytime Dysfunction		
	International Physical Activity Questionnaire – Short Form (IPAQ)	Individual	01
	3 Categories: Low Activity, Moderate Activity, & High Level of Physical Activity		
	Global Sleep Assessment Questionnaire (GSAQ)	Individual	01
	SF-36 Health Survey	Individual	01
	National Health Interview Survey – Days Ill	Individual	01
Social			
	Medical Outcomes Study Social Support Survey (MOS-SS)	Relationship & Community	01

3 Domains: Emotional, Tangible, & Affectionate		
Sarason Social Support Survey (SSSS) Sarason's Social Support Questionnaire – Short Form (SSQ)	Relationship & Community	01
DUKE-UNC Functional Social Support Questionnaire (FSSQ) 2 Subscales: Confidant Support & Affective Support	Relationship & Community	01
Social Support 3 Types: Need for Social Support, Need for Advice, & Need for Tangible Support	Relationship & Community	01
Cohen's Dimensions of Social Support Scale	Relationship & Community	01
Social Support Rating Scale (SSRS) 3 Dimensions: Subjective Support, Objective Support, & Social Support Availability	Individual, Relationship, & Community	01
Interpersonal Support Evaluation List (ISEL) – Short Form	Relationship & Community	01

	4 Dimensions: Tangible Aid, Appraisal, Self-Esteem, & Belonging		
Gender Role			
	Masculine Gender Role Stress (MGRS) Scale	Individual, Relationship, & Community	02
Quality of Life			
	World Health Organization Quality of Life (WHOQOL) Domains Used: Physical, Psychological, Social, Relationships, & Overall Quality of Life	Individual, Relationship, & Community	01
	World Health Organization Quality of Life (WHOQOL) Subscale: Sexual Satisfaction	Relationship	01
	Global Quality of Life (QOL)		01
Financial			
	Financial Stress 4 Components: Financial Situation, Income Adequacy, Debt, and Saving & Investment	Individual	01
Inter-Role			

	Work-Family Conflict (WFC) Scale 2 Subscales: Work-Family Conflict & Family-Work Conflict	Relationship & Community	01
Family			
	National Survey of Family Growth – Pregnancy Intendedness	Individual & Relationship	01
	Family Assessment Device–General Function (FAD-GF) Scale	Relationship	01
	Family Resources Scale	Relationship, Community, & Societal	01
	Family Adaptation Scale (During Postpartum Period)	Individual, Relationship, & Community	01
Self-Esteem			
	Coopersmith Self-Esteem Inventory (SEI)	Individual, Relationship, & Community	01

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Appendix AD

Supplemental Table 5

Domains (n = 12) in Tools According to Four Layers of the Socio-Ecological Model (SEM)

Domains	SEM Layers (Individual, Relationship, Community, & Societal)
Psychological	Risk factors related to psychological domain resulted due to the interplay between individual, relationship, and community. The interplay of societal layer was not taken into consideration.
Substance Abuse	Risk factors related to the domain of substance abuse resulted due to individual factors. The interaction between relationship, community, and societal layers was neglected.
Personality	Risk factors related to the domain of personality resulted due to an individual's factors. The role of other three layers (i.e., relationship, community, and societal) were ignored.
Relationship	Risk factors related to relationship domain resulted due to the interplay between all four layers of the SEM framework (i.e., individual, relationship, community, and society).
Physical	Risk factors related to physical domain resulted due to an individual's factors. The characteristics of other three layers (i.e., relationship, community, and societal) was discounted.
Social	Risk factors related to social domain resulted due to the interplay between individual, community, and relationship. The influence of societal layer was overlooked.
Gender Role	Risk factors related to gender role resulted due to the interaction between individual, relationship, and community. The role of societal layers in shaping up the gender role was disregarded.
Quality of Life	Risk factors related to the quality of life resulted due to the interplay primarily between individual, relationship, and community. The impact of presence or absence of policies under the societal layer was not studied.
Financial	Risk factors related to financial domain resulted because of an individual's factors; regardless of reflecting on the effects of relationship, community, and societal layers.
Inter-Role	Risk factors related to inter-role domain resulted due to the interaction between relationship and community, excluding the role of the other two layers (i.e., individual, and societal).

Family	Risk factors related to family domain resulted due to interplay between all four layers of SEM framework i.e., individual, relationship, community, and society.
Self-Esteem	Risk factor associated with the domain of self-esteem stemmed from the interplay between individual's factors, relationship, and community; without consideration of societal layer.

Appendix AE

Supplemental Table 6

Numbers of Tools (n = 54) Used According to Four Layers of Socioecological Model (SEM) Framework

SEM Layers	Tools Used (#)	Tools Used (%)
Individual	39	72.22
Relationship	25	46.30
Community	15	27.78
Societal	02	3.70