

improve communication, increase empathy and trust, and increase fulfillment in the relationship (3). Mutuality allows both parties to make unique, yet significant contributions to the relationship and feel personally fulfilled (4). Mutuality can act as a protective factor against burnout and compassion fatigue and truly understand what it means to employ caring phenomena (4). Curley argued that mutuality is the cornerstone of what it means to be a nurse (4). In today's nursing crisis, utilization of a concept like mutuality could be the key to curbing the crisis and retaining nurses within the profession.

When applied at a system level, mutuality is similarly impactful (2). Organizations that employ mutuality "attempt to lead, to integrate, to coordinate, and to co-produce healthcare based on the values of the co-operation and collaboration" (2). The health of the overall community is improved because of increases in self-efficacy and more connection being stimulated within the community (2). Organizations like this seek to engage with the populations they serve and provide healthcare in the way that the population seeks to be healthy (2). Health is not merely defined by a strict set of Western values (1). Health is defined by the individual, taking into consideration all cultural, social, and structural dimensions and involves balancing culture with biology (1). When a healthcare organization seeks to embrace this concept and use it, they are seeking to drive their organization with the lens of cultural competence and understanding (2).

Mutuality is vital to the practice of nursing because of its ability to empower both patients and nurses (2). Mutuality is transformative in that it increases patient satisfaction, improves conflict resolution, and improves accountability within healthcare (2,5). The ability to capture mutuality and improve upon it is essential for the furtherment of nursing practice (4,5). As stated prior, mutuality represents a key element in what it means to do the practice of nursing (4). In order to fully optimize the concept, the concept must be measured and it must be studied. At this time, there is no comprehensive review of measurement instruments of mutuality exists

that examines mutuality through application to nursing research, despite the prevalence of the concept throughout nursing literature. Therefore it is vital to examine mutuality as a nursing concept. The purpose of this integrated review is to identify measurement instruments that measure the concept of mutuality, examine these instruments for theoretical backing and psychometrics, and compare these instruments. This will help inform the study of mutuality and assist nursing researchers in selecting the measurement instruments for subsequent studies.

Methods

The concept of mutuality has been measured in a plethora of ways providing a rich body of research from which to start an integrated review of the literature. A single search was conducted in CINAHL and due to the volume of articles discovered, subsequent searches were not conducted. Search terms were "mutuality and measurement tool or assessment tool". The timeframe for the search included literature from all times until December 2021. Inclusion criteria included all article types, disciplines, and the use of an instrument to measure the concept of mutuality. Exclusion criteria included instruments measuring parent-child relationships.

Measurement instruments were analyzed by comparing theoretical frameworks and psychometrics. A theoretical framework is essential for providing depth and framing evidenced based practice in research (8). Psychometric properties included internal validity and factor analysis. Internal validity can be measured in a variety of ways, however, for the purposes of this analysis, Cronbach's alpha is the primary measure that was selected to compare internal validity across measurement instruments (9). Factor analysis measures the covariance of the individual measures within the instrument and can ultimately examine the ability of the instrument to properly measure the concept of interest (9). Internal validity and factor analysis are vital for understanding the psychometric strength of a measurement instrument.

Results

Search results are detailed below in the PRISMA flow chart in Figure 1. The search yielded seventeen articles, all of which were included for screening and retrieval. Of the seventeen articles, nine were excluded due to lack of relevance leaving eight articles included.

The articles included in the analysis are detailed in Table 1. Four measurement instruments were identified. The instruments included in the analysis include the Mutuality Scale (MS), the Mutuality and Interpersonal Sensitivity Scale (MIS), the Friendship Quality Questionnaire (FQQ), and the Connection Disconnection Scale (CDS).

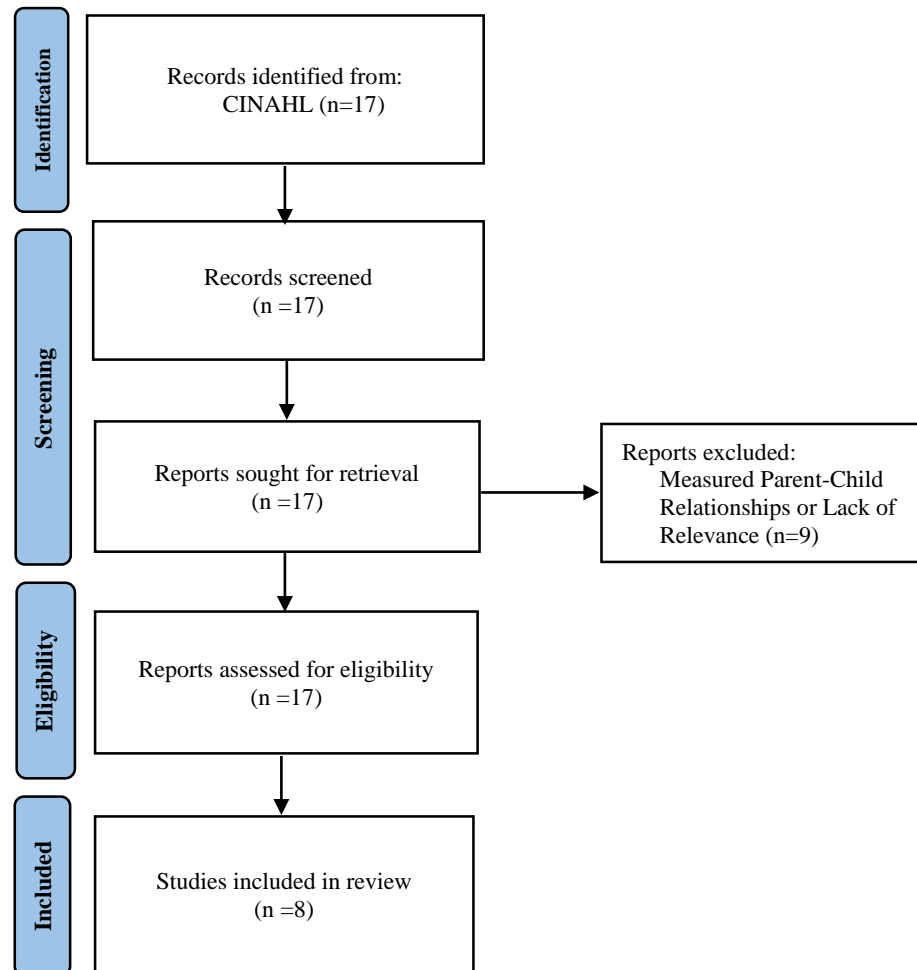


Figure 1. Search strategy-PRISMA flow chart

Table 1. Articles included in the analysis

Title of article	Authors (year)	Population	Measurement instrument	Theoretical framework	Scale developers	Cronbach's alpha	Factor analysis
Psychometric characteristics of the mutuality scale in heart failure patients and caregivers	Dellafiore et al (2018)	Heart failure patients and their caregivers	Mutuality Scale (MS)	Hirschfield Theory of Family Caregiving (1993)	Archbold et al, 1990	0.724-0.883	Acceptable fit indices and loadings
Does spouse participation influence quality of life reporting in patients with Parkinson's Disease?	Morrow et al (2015)	Patients with Parkinson's Disease and their families	Mutuality Scale (MS)	Hirschfield Theory of Family Caregiving (1993)	Archbold et al, 1990	NA	NA
Taking Care of the Dyad: Frequency of	Davis et al (2019)	Veterans with	Mutuality Scale (MS)	Hirschfield Theory of	Archbold et al, 1990	NA	NA

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Caregiver Assessment Among Veterans with Dementia		dementia and their caregivers		Family Caregiving (1993)			
Caregiver Role Strain and Rewards: Caring for Thais with a Traumatic Brain Injury	Smartkit et al (2010)	Thai patients with traumatic brain injuries and their caregivers	Mutuality Scale (MS)	Hirschfield Theory of Family Caregiving (1993)	Archbold et al, 1990	0.90	NA
Comparison of patient and partner quality of life and health outcomes in the first year after an implantable cardioverter defibrillator (ICD)	Doughtery et al (2015)	Patients with ICDs and their families	Mutuality and Interpersonal Sensitivity Scale (MIS)	Bandura Reciprocal Determinism (1978)	Lewis et al, 1993	0.93	NA
Couples' Communication and Quality of Life during Prostate Cancer Survivorship	Song (2009)	Prostate cancer survivors and their partners	Mutuality and Interpersonal Sensitivity Scale (MIS)	Bandura Reciprocal Determinism (1978)	Lewis et al, 1993	0.90	NA
Do risk factors for a problem behavior act in a culminative manner? An examination of ethnic minority and majority children through an ecological perspective	Atzaba-Poria et al (2004)	English and Indian children living in West London and their families	The Friendship Quality Questionnaire (FQQ)	Bukowski Theory of Friendships and Relationships (1987)	Parker & Asher (1993)	0.90	NA
Measuring Perceived Mutuality in Women: Further Validation of the Connection-Disconnection Scale	Sanfner & Tantillo (2010)	Collegiate women and their families, romantic partners, and friends	Connection-Disconnection Scale (CDS)	Relational Culture Theory (1976)	Tantillo & Sanfner (2010)	0.97-0.99	Acceptable fit indices and loadings after the wording were slightly changed on some of the questions

The mutuality scale (MS)

The scale most frequently identified was the Mutuality Scale (MS) (10,11,12,13). The MS represents a subscale of a much larger instrument, titled The Family Caregiving Inventory developed by Archbold and colleagues (14) and includes a caregiver version of the instrument and a patient version. Both are compared to identify how much mutuality exists within the relationship (14). The MS defines mutuality as consisting of four dimensions: love and affection, shared pleasurable activities, shared values, and reciprocity (14). The scale consists of fifteen items scored on a four-point Likert scale (14). The MS can be used to measure either caregiver or patient mutuality (14) and has been used to measure mutuality in a wide

variety of patient populations such as dementia (11), traumatic brain injuries (12), Parkinson's disease (13), and heart failure(11). Additionally, the MS has been translated into several languages such as Swedish (15) and Spanish (16).

Puccarelli and colleagues (17) have argued that the theoretical framework guiding this instrument is ambiguous and unclear. However, upon review of the original work (14), the developers of the instrument drew upon Hirschfield's (18) theory of family caregiving. Per Hirschfield (18), mutuality is essential in the caregiver relationship and defined as the "ability to find gratification in the relationship with the impaired person and meaning in the caregiving situation...and the caregiver's ability to perceive the impaired person as

reciprocating by virtue, his/her existence”(18). For Hirschfield (18), mutuality involves both parties receiving emotional satisfaction and benefits from the relationship.

Psychometrics have been calculated for the MS both in scale development and subsequent applications across various patient populations. Cronbach’s alphas have ranged from 0.724-0.90 (10,14,15,16). Factor loadings have varied depending on the populations being studied, however. Dellafiore and colleagues (10) showed good loading indices when studying heart failure patients. This study neglected to mention specific details about the study population such as nationality or ethnicity (10). When translated and applied to diverse cultural populations, the MS requires adjustment (15, 16). Studies regarding Swedish patients (15) and Mexican patients (16) have required the MS to be altered to allow for good factor loadings. Factor analysis may be required to be sure that the scale is measuring mutuality according to the definition posed by Hirschfield (18) in settings where English is not the language in which the scale is delivered.

The mutuality and interpersonal sensitivity scale (MIS)

The Mutuality and Interpersonal Sensitivity Scale (MIS) was identified in two articles (19, 20). The MIS uses 32 items to capture meanings, attitudes, and orientations toward living with a given diagnosis using Likert scale questions (21). The scale was originally developed to measure relationships between caregivers and patients undergoing a cancer diagnosis (21) and has since been applied to a variety of cancer (22,19) and heart failure diagnoses (20).

The MIS has conceptual underpinnings in Bandura’s (23) Reciprocal Determinism. Reciprocal determinism is the idea that people are more than reactions to events that occur in their lives, but that people are also influenced by personal factors as well as environmental factors (23). Bandura (23) defines mutuality as a reciprocal, non-fatalistic

relationship and a concept that can be used to guide interventions to modify adverse human behavior. Bandura’s (23) theory is based on the idea of patient empowerment and efficacy to change health behaviors, and mutuality contributes to that. Bandura’s (23) theory is robust (24) and a noteworthy theoretical basis for the construction of a measurement instrument.

The two studies generated by the search (19,20) Cronbach’s alphas (0.90-0.93) were similar to findings from scale developers (21, 22) . Factor analysis was not conducted by either of the studies generated from the search (19,20). In scale development, the scale developers ran into a plethora of problems getting the factor loadings to load correctly, indicating the presence of confounders (21). In subsequent uses of the model, there has been a lack of sensitivity to detect changes in relationships that may be significant when measuring overall mutuality (21, 22). It is not evident in the literature if this scale accurately measures the concept of mutuality due to a lack of published psychometrics.

The friendship quality questionnaire (FQQ)

The Friendship Quality Questionnaire (FQQ) was identified in one of the studies generated by the search (25). The FQQ was designed to measure the quality of relationships between children (26). At the time of the development of the scale, researchers were exploring a relationship between a lack of mutuality in relationships and loneliness(26). This scale was designed to measure the reciprocity and mutuality in relationships using six measures: validation and caring, conflict and betrayal, companionship, and recreation, help and guidance, intimate exchange, and conflict resolution (26). This is completed using 40 statements in which the participants rate the veracity of the statements in relation to their “best friend” using a five-point Likert scale (26). From these ratings, a score can be calculated to rank the quality of the relationship (26). This scale has been applied to a variety of populations of children

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including Brazilian children (27), children with anxiety disorders (28), and urban, English, and Indian children living in West London (25). However, the scale has not been applied to adults. The scale has primarily been administered in English; however, it has also been administered in both English and Gujarati, a language is commonly spoken in western parts of India (25).

The FQQ is based on the theoretical framework posed by Bukowski and colleagues (29) about how children form relationships and maintain them through mutuality. Bukowski and colleagues (29) identified four primary components of a friendship. These were the importance of intimacy, the relative importance of various aspects of a friendship, gender differences, and the stability of the friendship (29). Depending on the age of the child, one of these four items would be more or less important in evaluating a given friendship (29). The FQQ expands on many of Bukowski and colleagues' (29) tenants in order to understand relationships and mutuality between children.

In the study generated by the search, Cronbach's alpha was calculated to be 0.90 (25), similar to that calculated by the instrument developers (26) and by others who have used this scale (27, 28). Scale factors had high covariance when factor analysis was conducted (26). Although factor analysis was not conducted by the authors of the study generated by the search (25), factor analysis has demonstrated good internal reliability and validity among all of the subscales in other research (27, 28).

The connection-disconnection scale (CDS)

One study was identified in the search that used the Connection-Disconnection Scale (CDS) (30). The CDS consists of two parts (30). In part I, the participant engages with a relational scenario that represents disconnection in their lives (30), the goal of which is to place the participant in the correct frame of mind to answer part II truthfully and accurately (30). Part II consists of a 16-item

questionnaire answered with a six-point Likert scale (30). This section measures the attributes of mutuality: empathy, authenticity, engagement, empowerment, zest, and diversity (30). The CDS has been applied to collegiate women suffering from eating disorders (30), individuals undergoing vocational rehabilitation (31) and most recently, to understand encounters with healthcare and the emergence of mental illness (32). Authors have advocated for use of the scale (33, 34), but its application has been limited to date. Jackson (35) has noted difficulty with completing the interview component of the instrument. It is possible that this difficulty has been encountered by other researchers and has hampered its ability of it to be used widely.

The theoretical underpinnings of the CDS are from Relational-Cultural Theory (RCT), which has an emphasis on reciprocity within relationships and mutual empowerment (6, 36). Although this scale has been applied less frequently than the other measurement instruments, it is robust in its conceptual definitions and theoretical framework (33,34,37). RCT itself is a prominent theory in counseling and is often employed in practice in addition to research (6, 33).

The study generated by the search was an initial publication that detailed scale development (30). Psychometrics (30) calculated Cronbach's alphas ranging from 0.97 and 0.99 and found strong correlations within the scale. Cronbach's alphas in other scale development publications ranged from 0.96-0.97 across population groups (38). Factor loadings were calculated in the study generated by the search as well. These found good fit indices with only minor edits to some of the questions included in the instrument (30).

Discussion

Research regarding the concept of mutuality is currently evolving as new instruments and theoretical frameworks are developed (33). Multiple measurement instruments, theoretical frameworks, and

conceptual definitions exist as evidenced by the variety of instruments generated by this search. Mutuality has been applied in a variety of areas within healthcare to describe relationships. This review explored the MS, MIS, FQQ, and CDS, which represent four prominent measurement tools that measure various conceptual definitions of the concept of mutuality.

These four instruments identified in this review provide valuable insight into the concept of mutuality and how it can be applied across patient populations. From breast cancer (30) to pediatrics (25), mutuality represents an important aspect of human life and human relationships. Despite the variability in conceptual definitions, mutuality appears to be agreed upon in the literature as having a dual nature of emotional satisfaction, as well as tangible benefits. This in and of itself is a new revelation about the concept.

The MS was the most frequently used instrument generated by the search. Critics of the scale (17) note its ambiguous nature; however, Archbold and colleagues (14) ascertain that their concept of mutuality originates from Hirschfield (18). Additionally, psychometrics of the MS has been calculated across a broad range of patient populations, showing only minor adjustments when applied in non-English speaking populations. The MS certainly shows promise as an instrument measuring mutuality.

The MIS demonstrated a theoretical foundation as well. Bandura's (23) Theory of Reciprocal Determinism was shown to be the theoretical basis for this instrument (22). This scale showed a significant limitation, however. The only psychometric property that has been calculated on this instrument is Cronbach's alpha. Factor analysis has not been conducted on this instrument so evaluation of the strength of the instrument is limited to internal consistency. Research investigating the psychometric properties of this scale would be beneficial for examining if mutuality is being consistently measured across diverse patient populations.

The FQQ showed a theoretical framework in addition to strong psychometrics. However, the patient population that this has been applied to is limited to children. In addition, the framework driving the FQQ is Bukowski and colleagues' (29) which is a theory of mutuality between children. Adults have never been evaluated using this scale. However, components of the scale are markedly similar to components of general relationship satisfaction and mutuality. Relational-Cultural Theory (6) states that growth-fostering relationships are brought about by mutuality empowerment and mutual engagement. In addition, a growth-fostering relationship is characterized by a desire to engage more fully in the relationship, zest, increased knowledge of oneself and the other, a desire to take action within the relationship, and an increased sense of worth (6). The FQQ has the stability of the relationship being tied to a sense of worth and intimacy within the relationship (26). Future research could focus on the potential differences experienced between adult and pediatric mutuality and if this instrument possesses the sensitivity to highlight these differences if differences exist.

In addition, the dynamic of the relationship examined by the FQQ is distinctly different from the relationship between a clinician and a patient. Traditionally, clinicians are taught to form fewer intimate relationships with patients and maintain professional boundaries (39). However, bi-directional communication seems to warrant a more intimate kind of relationship between clinicians and patients, especially when introducing the concept of mutuality. Friendships with patients have been found to increase trust and adherence to care (39). However, the concept of professional boundaries is a significant consideration (39). Approaching patient relationships from the perspective of friendship would be an approach that has been little explored. More research would be indicated in this area.

The CDS represents the newest measurement instruments generated by the search. The theoretical framework underpinning the instrument has had a lasting

impact on the field of psychotherapy (37). The components of the CDS align very closely with the components of RCT (6) thereby adding to the theoretical strength of the instrument. However, since the scale has been tested less than the other scales and applied to fewer patient populations. Initial psychometrics show promising results (30, 38) and future research testing these further would be beneficial.

Theoretical framework and psychometrics are going to drive the selection of a given instrument. In diverse populations, MS has only required minor adjustments to factor load appropriately. Additionally, MS contains a theoretical basis and definition of mutuality which guides the instrument. MIS has a theoretical basis, however, is lacking in psychometrics. Factor loadings are essential for verifying that the instrument is measuring the concept in question so research in this direction may be merited in order to fully utilize this instrument. The FQQ has the benefit of strong psychometrics and theoretical framework, however, is limited to the study population of children. If applied to adults, psychometrics would need to be measured in order to ensure that the scale is measuring appropriately. The CDS is the newest developed of all of the instruments examined. For this reason, psychometrics have not been thoroughly conducted outside of initial scale development. Preliminary analysis shows potential for applicability of the scale, however, more studies are indicated. CDS has a theoretical framework, therefore making it applicable in a variety of situations.

Conclusion

Mutuality is a key concept that has relevance within nursing research (4). This integrated review examined instruments that measure the concept of mutuality for application in nursing research. Four key instruments were identified by the literature search and showed promise for application in nursing research. These were the MS, MIS, FQQ, and CDS. All four instruments were analyzed for the presence of a theoretical

basis in addition to psychometric strength. It was found that the MS contained a theoretical backing and strong psychometrics across diverse populations. The MIS was discovered to have a theoretical base, however, did not have strong psychometrics. The FQQ had theoretical underpinnings and psychometrics, yet it had not been applied in adult populations. The CDS is a scale that has been developed most recently and thus remains largely untested outside of initial scale development. It possesses a theoretical framework, however, does not have a history of large psychometric testing. All four of these instruments pose strengths and weaknesses in various areas and show promise in being applied to diverse populations and within nursing research. Subsequent nursing research should focus on identifying if psychometrics remain stable across diverse populations and identifying how mutuality can be applied to emerging issues facing the nursing profession.

Limitations

A lack of thorough psychometrics proved to be a challenge when evaluating and comparing the utility of the different instruments. Psychometrics is an important aspect of pushing forward the idea of evidenced-based practice (40) and provides an empirical base for comparison between instruments (40). In addition, psychometrics is essential for evaluating if the questions posed in the instrument are accurately measuring the concept of interest (40). An absence of reported psychometrics results in an instrument that may be less rigorous and more vulnerable to scrutiny. This lack of thorough psychometrics between the instruments proved to be the largest challenge when conducting this integrated review. Future research should focus on testing these instruments to test their validity.

A single search was conducted in CINAHL and due to the volume of articles discovered, subsequent searches were not conducted. So, this review was not comprehensive enough to include all instruments that measure mutuality that exist.

Additionally, the scope of this review only covered theoretical frameworks and psychometrics. There are other points of comparison between these instruments that merits evaluation. For example, mutuality has been studied across a wide range of patient populations with varying degrees of success. An evaluation of these populations would most certainly be beneficial in subsequent studies.

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Conflict of interest

Authors have no conflicts of interest to disclose.

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