Caregiver Burden in Parents Providing Care for Children with Serious Mental Illness: A Systematic Review and Meta-Analysis

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ABSTRACT

Aim: The main purpose of this investigation is to explore and identify the factors that contribute the most to the exacerbation of caregiver burden for informal caregivers of individuals with serious mental illnesses (SMIs).
Procedure: Literature searches comprised 18 combinations of search terms related to caregiver burden and serious mental illness. Across eight databases, 1532 articles were identified. After removing 596 duplicates, 936 articles were screened for inclusion criteria, resulting in three studies that met the criteria. This small number of articles included were due to the specificity of our inclusion criteria. From these articles, correlations between caregiver burden and any other variable were extracted. Meta-analysis was conducted using a three-level meta-analytic model.
Results: A total of five factors were identified across the included articles: parent age, parent education, parent health, social support, and care recipient characteristics. The three-level meta-analytic model identified the factors parent health, ($z = .314$, CI [.138, .490], $se = .074$, $t(7) = 4.222$, $p = .004$), and social support ($z = -.155$ CI [-.282, -.027], $se = .056$, $t(9) = -2.750$, $p = .022$), to have significant overall effect sizes. The remaining factors did not yield significant overall effect sizes.
Conclusions: This review reveals that there is still limited research on caregiver burden for caregivers providing support to individuals with SMIs, to the level of specificity that accounts for the different relationships in caregiver-care recipient dyads. However, from the data available, variables that had the largest impact on caregiver burden measures were parental health and social support. These aspects may be possible targets for informal caregiver support.

KEYWORDS

Caregiver Burden; Caregiver Burnout; Serious Mental Illness; Informal Caregiver; Parental Caregiver; Risk Factors; Systematic Review; Meta-Analysis

INTRODUCTION

Serious mental illnesses (SMIs) are prevailing mental, behavioral, and emotional disorders that result in the impairment of daily functioning.[1] This impairment of functioning often leads to difficulties in maintaining employment, strained interpersonal relationships, homelessness, and incarceration.[2] As of 2021, data from the National Survey on Drug Use and Health (NSDUH) estimated that 5.5% (14.1 million) of non-institutionalized adults have an SMI.[3]

The specific disorders considered to be SMIs vary across the literature.[4] The term SMI is not a category found in official diagnostic manuals, such as the DSM, but generally includes mental disorders that are considered to be debilitating and cause serious functional impairment.[4] The term SMI was first created to categorize psychiatric disorders for grants funding research on mental illness.[5] As such, the definition was originally created to be flexible. The consensus across current literature is the inclusion of psychotic spectrum disorders and bipolar disorders under the category of SMIs.[6] However, the inconsistencies lie in the inclusion by some researchers of other psychiatric disorders such as mood disorders, anxiety disorders, eating disorders, and personality disorders. Some consider substance use disorders as part of SMIs, while others consider this category as a comorbidity.[7] Before publication of the DSM-5, obsessive compulsive disorder (OCD) and post-traumatic stress disorder (PTSD) were considered SMIs under the category of anxiety disorders.[8,9] However, PTSD was sometimes viewed as a comorbid disorder that frequently co-occurred with SMIs.[10] This pattern was also observed with OCD, where the disorder was considered as either a comorbidity or a SMI, depending on the study.[11,12] For the purposes of this meta-analysis, we used the operational definition from the Agency for Healthcare Research and Quality, which included the following disorders: severe anxiety disorders, major depression, bipolar disorder, psychotic disorders, as well as severe eating and personality disorders.[2] This definition includes a

wide range of psychiatric disorders while eliminating disorders that are sometimes considered comorbid conditions, as previously listed.

Current literature identifies that most SMI patients are cared for outside of healthcare institutions, where the enrollment of outpatient care was the most common.[13,14] Following the deinstitutionalization movement in the 1960s, public healthcare institutions that fully support individuals with SMIs have yet to be established.[15] This shift caused psychiatric patients to be transferred out of institutional care and into communities instead.[16] Therefore, most SMI patients who were not incarcerated depended on family members for the majority of care.[15] Familial caregivers are considered to be informal caregivers, which may be defined as individuals who provide care without professional training or compensation with regards to their caregiving responsibilities.[13] From 2015 to 2020, the number of family caregivers in the United States has increased by 9.5 million– with 5% of the care recipients reporting the main problem to be mental or emotional illness.[17] Given that these individuals have less resources and support in comparison to formal caregivers, namely healthcare providers, they are more likely to experience physical and mental strain due to caregiving tasks.[18]

The term caregiver burden has been used to describe the negative experiences that arise due to an individual's caregiving responsibilities– including psychological and physical impacts. The experience of strain has been described to be a product of caregivers delaying their needs to provide care for long periods of time.[19] Caregiver burden can be defined as the persistent difficulties, stress, and psychological hardship experienced by caregivers due to looking after another individual with a given disorder.[20,21] Current literature on caregiver burden has been concentrated on caregiving for individuals with dementia and physical illnesses, given the aging population and the corresponding disabilities of the demographic.[22] The specific experiences of caregiving, especially between parent and children, are also well documented in neurodevelopmental disorders.[23,24] However, a much smaller proportion of the literature is dedicated to caregiving for individuals with SMI, despite the nature of current treatment in which patients have limited options for institutional care.[25] Additional difficulties providing care for individuals with SMI may also include the comorbidity of substance dependency and a high relapse rate of symptoms.[2] These complications oftentimes require more support, in addition to regular caregiving needs. Thus, having a diagnosis of SMIs is often debilitating for the diagnosed individual as well as those within their social circle.

The Current Study
The purpose of the present research was to use a systematic review and meta-analysis to identify and assess the relative strength of risk factors that contributed to caregiver burden among parents caring for children with SMIs. Given that caregiver burden in SMIs have not been as well documented in comparison to other conditions, this study will also identify the gaps in literature that can be addressed in future research. For this analysis, studies were included in which care recipients had the following diagnoses: severe anxiety disorders, major depression, bipolar disorder, psychotic disorders, as well as severe eating and personality disorders.[2] Additionally, only studies assessing informal parental caregivers [i.e., parents who provide care for a child without prior training or financial compensation][13] were included. To date, there has not been a meta-analysis that explores the different risk factors and its effects on caregiver burden.

METHODS
The present research consisted of a systematic literature review following the PRISMA-P Protocol,[26] which was pre-registered on Open Science Framework (OSF) prior to data collection and analysis (https://osf.io/gm65x). Systematic literature review data were managed through adapted templates provided by Moreau & Gamble.[27]

Inclusion Criteria
To be included in data analysis, articles were screened according to the following criteria: (1) must be a study that investigates factors associated with caregiver burden, defined as persistent difficulties, stress, and psychological hardship experienced by nonprofessional caregivers due to looking after another individual with a given disorder; (2) the care recipient must be diagnosed with an SMI, which includes psychotic disorders, bipolar disorder, major depression, severe anxiety, eating and personality disorders; (3) the caregiver figure must be informal, defined as individuals providing care without prior training or financial compensation for their caregiving role; (4) the study population must be parent caregivers and children (any age) care recipients; (5) the study is peer reviewed and published; (6) the study must be available in English; and, (7) the study must have provided a sample size and corresponding Pearson correlation coefficient for measures associated with caregiver burden.

Studies were excluded according to the following criteria: (1) did not investigate caregiver burden and associated factors; (2) the care recipients did not have SMIs, as defined above; (3) the caregivers were not informal, as defined above; (4) did not investigate the stated population of interest (i.e. parent caregiver); (5) was not available in English; (6) was not peer reviewed/published; (7) a

review or meta-analysis; (8) was not an empirical research article (i.e., editorial, book, qualitative or theoretical study); (9) did not represent a unique dataset from other included research.

Information Sources & Search Process
The systematic literature review (summarized in **Figure 1**) utilized article searches from the following electronic databases: PsychInfo, PubMed, PsychArticles, ScienceDirect, Web of Science, Gale OneFile: Psychology, GoogleScholar, and ProQuest. The search terms were based on variations of commonly used keywords in literature associated with caregiver burden and SMI. A total of 18 combinations of search terms were used in each electronic database. These 18 combinations represent a subset of all 30 possible combinations of five variations of caregiver burden (i.e., caregiver burden, caregiver strain, compassion fatigue, caregiver stress, caregiver burnout), three variations of SMI (serious mental illness, severe mental illness, mental illness), and either risk factors or informal caregiving (**Table 1.1**). Searches that produced over 100 results were excluded from review. All searches were conducted between June and July of 2023.

Search Term 1	*AND* Search Term 2	*AND* Search Term 3
"caregiver burden"	"serious mental illness"	"informal caregiver"
"caregiver burden"	"risk factors"	"serious mental illness"
"caregiver burden	"risk factors"	
"caregiver burden"	"risk factors"	"informal caregivers"
"caregiver burden"	"informal caregiver	"serious mental illness"
"caregiver burden"	"informal caregiver"	"mental illness
"caregiver burden"	"mental illness"	
"caregiver burden"	"informal caregiver"	"severe mental illness"
"caregiver burden"	"risk factors"	"severe mental illness"
"caregiver strain"	"informal caregivers"	"serious mental illness"
"compassion fatigue"	"serious mental illness"	
"caregiver stress"	"informal caregiver"	"serious mental illness"
"caregiver stress"	"risk factors"	"serious mental illness"
"caregiver burnout"	"risk factors"	"serious mental illness"
"caregiver burnout"	"informal caregiver"	"serious mental illness"

Table 1.1 Search Strings Utilized in Each Database

Searches yielded 1532 total results. After removing 596 repeated articles, 936 article abstracts were reviewed by the first author and by one of the other authors for inclusion. This process was carried out using the predetermined inclusion criteria. If the abstract was unclear, the contents of the article were evaluated for inclusion or exclusion. There were no discrepancies in the inclusion or exclusion of articles across reviewers. This review process resulted in nine potential articles for full evaluation, which were conducted independently by the first and second author. Based on this full evaluation, we identified six articles that did not meet the inclusion criteria, specifically three did not include variables and/or population of interest, and three did not provide adequate data for inclusion in meta-analysis. As such, three articles had sufficient data for further analysis (**Table 1.2**).

	Cook *et al.*[28]	Greenberg *et al.*[29]	St-Onge & Lavoie[30]
Sample Size	222	105	99
Gender	55% mothers 45% fathers	100% mothers	100% mothers
Age	36 to 84 years (M = 55)	55 to 89 years (M = 66; SD = 6.69)	43-79 years (M = 62.1) 63.6% were 60 or older
Ethnicity	83% White, 11% African American 4% Asian 1% Hispanic/Latino .5% Native American .5% Multi-ethnic	NA	NA

Education	Education ranged from seven to 22 years, with a mean of 14 years	81% completed high school 42% completed some college	17.2% some post-secondary education 6% some university education
Annual Family Income	Mean annual family income in the $30,000-$40,000 range (USD)	Median annual family income was $25,000 (USD)	Mean annual family income in the $20,000 and $24,999 range (CAD)
Recruitment	Participants were interviewed by research staff after their children began treatment at a large psychiatric rehabilitation agency in Chicago, United States.	Majority of respondents were recruited though state/county service providers, others through stage agency on aging, and current participant nomination. All participants resided in Wisconsin, USA.	Recruited through general and psychiatric hospitals in Quebec, Canada.
Child SMI Diagnosis	52% schizophrenia 48% other diagnoses (e.g., mood or personality disorder)	70% schizophrenia 19% bipolar disorder 7% major depression 4% other SMI	psychotic disorders (i.e., schizophrenic, schizophreniform or schizo-affective disorders, or atypical psychosis)

Table 1.2 Sample Characteristics of included studies

Data Extraction
Given the small number of articles that met the search criteria, associations between caregiver burden and any variable were extracted. These included: (1) Pearson's r values for any correlations between any measured variable and caregiver burden, (2) sample size for that correlation, (3) all reported sample characteristics, (4) specific measures used for caregiver burden, and (5) specific measures of associated variables.

RESULTS
Identifying Factors
From the three articles, correlates with caregiver burden were identified and grouped for meta-analysis into five factors (**Table 2**). Parent age was assessed in three studies (Cook *et al.*[28]; Greenberg *et al.*[29]; St-Onge & Lavoie[30]), all measuring age in years. Parent education was assessed in two studies (Cook *et al.*[28]; St-Onge & Lavoie[30]). Cook *et al.*[28] assessed years of completed formal schooling. St-Onge & Lavoie[30] did not specify how education was assessed but reported on the average level of schooling completed as university-level and postsecondary education. Thus, it is most likely that correlations were calculated utilizing an ordinal measurement. The parent health factor assessed physical/mental health of caregivers across two studies (Cook *et al.*[28]; St-Onge & Lavoie[30]). Cook *et al.*[28] assessed parent health using the Symptom Checklist-90,[31] which measures parent's perception of their physical and psychological wellbeing. St-Onge & Lavoie[30] used an adapted scale from Brook *et al.*[32] and Platt *et al.*,[33] which measured parent's perception of their physical health. The social support factor assessed caregivers' perceptions of social support across two studies (Greenberg *et al.*[29]; St-Onge & Lavoie[30]). Greenberg *et al.*[29] measured social support based on Antonucci's[34] Social Support measure in which participants indicate the number of people they felt a special connection with. Additionally, participants indicated the extent to which they perceived their social connections as supportive. St-Onge & Lavoie[30] measured social support using Perceptions of Social Support from Friends and Family,[35] and the Kaplan Intimacy and Adaptation Scale.[36] The care recipient functioning factor was assessed across three studies (Cook *et al.*[28]; Greenberg *et al.*[29]; St-Onge & Lavoie[30]). Cook *et al.*[28] measured the caregiver's perceptions of the care recipient's functional impairment using the Global Assessment Scale.[37] Greenberg *et al.*[29] used Bruininks, Hill, Weatherman, & Woodcock's[38] count of up to eight maladaptive behaviors manifested by the care recipient. St-Onge & Lavoie[30] used Parker & Rosen's[39] Life Skills Profile, which assess the presence and impact of care recipient maladaptive behaviors.

Data Analysis
Fisher's Z transformation and variance were calculated using the Wilson Practical Meta-Analysis Effect Size Calculator.[40] As there were multiple measurements used to assess caregiver burden and factors associated with it within and across each study, we conducted a three-level meta-analytic model in R using the methods described in Assink & Wibbelink.[41] As such, for each factor we assessed overall effect size, overall measurement heterogeneity, and within-study and between-study variance. There were not enough studies that met inclusion criteria to quantitatively assess sources of within and between-study heterogeneity (e.g., moderators). As such, we present qualitative analysis of factors that may have impacted within-study and between-study variance.
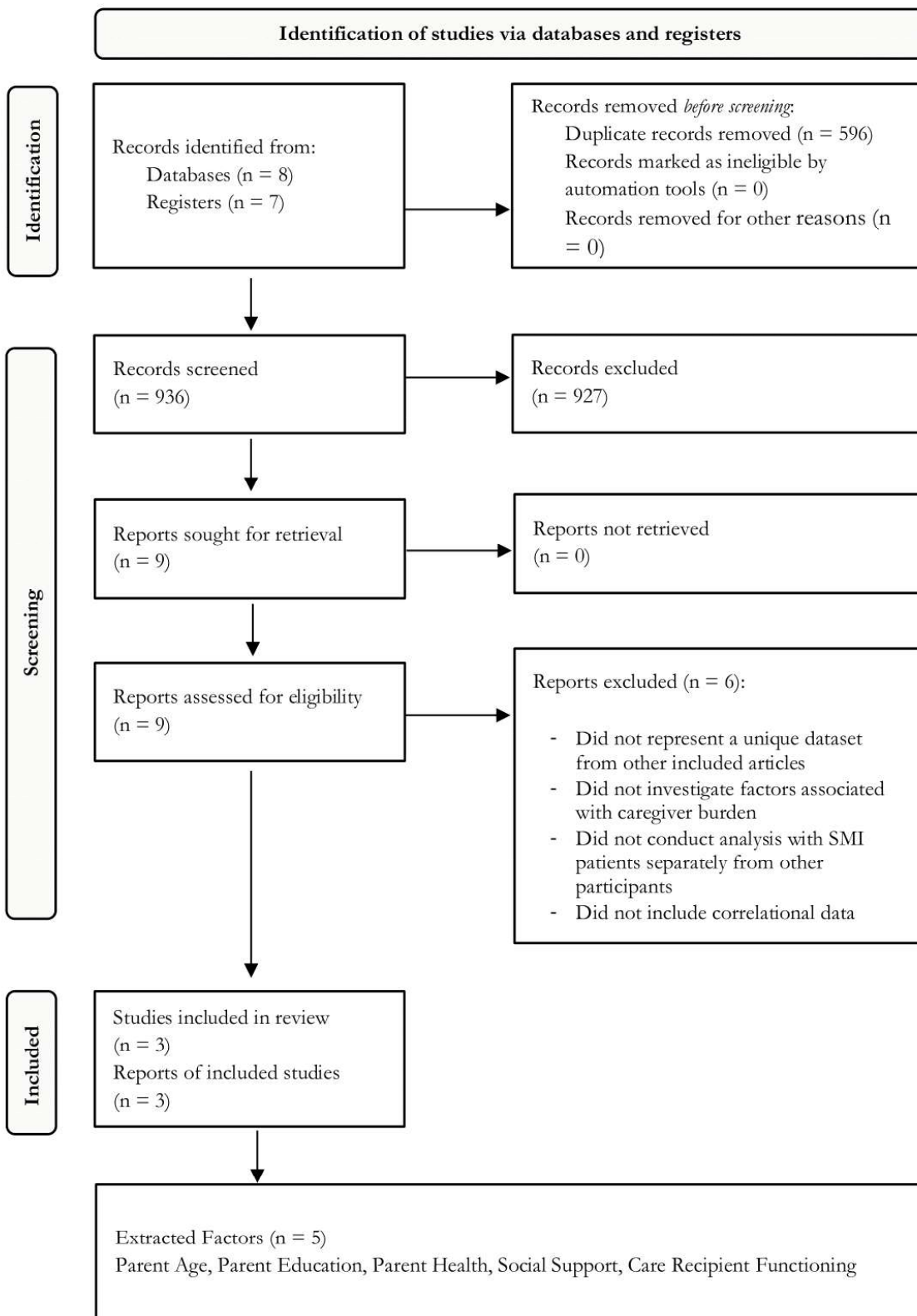
Identification of studies via databases and registers

Identification

Records identified from:
Databases (n = 8)
Registers (n = 7)

Records removed *before screening*:
Duplicate records removed (n = 596)
Records marked as ineligible by automation tools (n = 0)
Records removed for other reasons (n = 0)

Screening

Records screened
(n = 936)

Records excluded
(n = 927)

Reports sought for retrieval
(n = 9)

Reports not retrieved
(n = 0)

Reports assessed for eligibility
(n = 9)

Reports excluded (n = 6):

- Did not represent a unique dataset from other included articles
- Did not investigate factors associated with caregiver burden
- Did not conduct analysis with SMI patients separately from other participants
- Did not include correlational data

Included

Studies included in review
(n = 3)
Reports of included studies
(n = 3)

Extracted Factors (n = 5)
Parent Age, Parent Education, Parent Health, Social Support, Care Recipient Functioning

Figure 1. Search Summary

Meta-analytic Results

The parent age variable consisted of 12 effect sizes extracted from three studies (**Table 2**). The estimated overall effect size was not significant (z = .031 CI [-.051, .113], se = .037, t(11) = .831, p = .424), indicating that parent age did not have a significant effect on measures of caregiver burden. The test of heterogeneity between all effect sizes was significant (Q(11) = 25.236, p = .008), indicating significant differences across effect sizes. Constraining the within-study variances to zero significantly decreased the fit of the model (ΔAIC = -4.470, p = .011), indicating that the within-study variance was statistically different from zero. This indicates that there were significant differences in effect sizes within each study. These differences are most likely attributed to measurement, most notably within Cook *et al.*[28] This study assessed caregiver burden with the adapted Thresholds Parental Burden Scale.[42,43] This measure consisted of six dimensions [i.e., feelings of connection to care recipient (connection), preoccupation with and worry about care recipient (cognitive), perceptions of ongoing responsibility for care recipient (responsible), perceptions that care recipients behavior was unmanageable (behavior), familial discord and disagreement about care recipient (disagree), and concerns about care recipient's prognosis and future (future)], with correlations of the independent variables recorded for each dimension (**Table 2**). Cook *et al.*[28] concluded that age was differentially predictive of caregiver burden based on measurement, specifically that older parents experienced higher cognitive burden while younger parents experienced higher behavior burden.

Similarly, Greenberg *et al.*[29] and St-Onge & Lavoie[30] both used two distinct measurements of caregiver burden, although differences across measurement was not a focus of either study as it was in Cook *et al.*[28] Greenberg *et al.*[29] utilized a repeated measures design, where participants completed two measures of caregiver burden at two time points three years apart. Caregiver burden was assessed using the Zarit Burden Interview,[44] which measures caregiver subjective burden resulting from a range of problems including well-being and social relationships, and the Center for Epidemiological Studies-Depression Scale,[45] which assesses depressive symptomology. St-Onge & Lavoie[30] included two measures of burden, one assessing psychological distress, the other assessing perceived impact from caregiving like isolation and confinement. Given the variability in measurement within each study, the differences in effect sizes for factors that rely on more than one measure for a particular construct are not surprising.

Constraining the between-study variances to zero did not significantly change the fit of the model (ΔAIC = 2.000, p = 1.000), indicating that the between-study variance was not statistically different from zero. This indicates no significant differences in effect sizes across the three studies. Measurement invariance for age is likely given that all age data were collected in the same way. Additionally, the three samples are somewhat similar in composition (e.g., all from North America, moderate SES) (**Table 1.2**).

The parent education variable consisted of eight effect sizes extracted from two studies (**Table 2**). Both studies used parent education level as a demographic variable, rather than a main independent variable. Correlations extracted from these studies were primarily negative and weak to moderate in strength. The estimated overall effect size was not significant (z = -.106 CI [-.265, .053], se = .067, t(7) = -1.576, p = .159), meaning that parent education did not have a significant effect on measures of caregiver burden. Additionally, the test of heterogeneity between all effect sizes was not significant (Q(7) = 13.926, p = .053). Given effect size homogeneity, we did not expect significant within or between-study variances. As expected, constraining the within-study variances to zero did not significantly decrease the fit of the model (ΔAIC = .540, p = .227), indicating that the within-study variance was not statistically different from zero. Likewise, constraining the between-study variances to zero did not significantly decrease the fit of the model (ΔAIC = 1.605, p = .530, indicating that the between-study variance was not statistically different from zero. The homogeneity across effect sizes is not surprising given the consistently weak correlations across measurements and studies.

The parent health variable consisted of 8 effect sizes extracted from two studies (**Table 2**). The estimated overall effect size was significant, (z = .314 CI [.138, .490], se = .074, t(7) = 4.222, p = .004), meaning that parent health had a significant negative effect on measures of caregiver burden. The test of heterogeneity across all effect sizes was significant, (Q(7) = 32.687, p < .001). Constraining the within-study variance to zero significantly decreased the fit of the model (ΔAIC = -10.568, p = .000), indicating significant differences in effect sizes based across different measurements used within each study. As mentioned in the parental age section, Cook *et al.*[28] assessed caregiver burden across six subscales from one measure and St-Onge & Lavoie[30] used two distinct measures. Although the correlations extracted from both studies were all positive in direction, they ranged from weak to moderate. This supports the previous assessment from parental age that aspects of caregiver burden are differentially associated with other outcomes.

Constraining the between-study variance to zero did not significantly decrease the fit of the model (ΔAIC = 1.948, p = .821), indicating that the between-study variance was not statistically different from zero. This indicates no significant difference in effect sizes across the two studies, despite different measures used to assess both caregiver burden and parent health. Cook *et al.*[28]

assessed parent's perception of their physical and psychological wellbeing, while St-Onge & Lavoie[30] assessed parent's physical health only. As noted in the parental age section, the samples are also relatively similar (**Table 1.2**).

The social support variable consisted of 10 effect sizes extracted from two studies (**Table 2**). The estimated overall effect size was significant, (z = -.155 CI [-.282, -.027], *se* = .056, *t*(9) = -2.750, *p* = .022), meaning that social support had a significant negative effect on measures of caregiver burden. The test of heterogeneity between all effect sizes was not significant, (*Q*(9) = 13.603, *p* = .137). Given effect size homogeneity, we did not expect significant within or between-study variances. As expected, constraining the within-study variances to zero did not significantly decrease the fit of the model (*Δ*AIC = 1.263, *p* = .391), indicating that the within-study variance was not statistically different from zero. Likewise, constraining the between-study variances to zero did not significantly decrease the fit of the model (*Δ*AIC = 1.833, *p* = .167), indicating that the between-study variance was not statistically different from zero. The homogeneity across effect sizes within and between studies suggests that the negative association between social support and caregiver burden may be more generalizable across measurement of both constructs. Measures of caregiver burden are described in the above sections. Greenberg *et al.*[29] assessed social support via the size of the caregiver's social network and St. Onge & Lavoie[30] assessed three aspects of social support: the quality of relationships with close confidants (Kaplan Intimacy and Adaptation Scale)[36], and perceived social support from family and friends (separate subscales assessed with Perceived Social Support from Friends and from Family)[35]. Homogeneity across these measures may indicate that the positive benefits of social support on various aspects of caregiver burden do not depend exclusively on a single aspect of the social network.

The care recipient functioning variable consisted of 12 effect sizes extracted from three studies (**Table 2**). The estimated overall effect size was not significant (z = .211 CI [-.062, -.483], *se* = .139 *t*(11) = 1.516, *p* = .129), meaning that care recipient functioning overall did not have a significant effect on measures of caregiver burden. The test of heterogeneity between all effect sizes was significant (*Q*(11) = 76.308, *p* < .001). Constraining the within-study variances to zero significantly decreased the fit of the model (*Δ*AIC = -4.550, *p* = .011), indicating that the within-study variance was statistically different from zero. This heterogeneity within studies is likely due to the variability in caregiver burnout measurement.

Constraining the between-study variances to zero significantly decreased the fit of the model (*Δ*AIC = -4.868, *p* = .009). The differences in effect sizes across the three studies could be a result of the differences in measures of caregiver burden or care recipient functioning. Cook *et al.*[28] assessed functional impairment of the care recipient using the Global Assessment Scale.[37] Greenberg *et al.*[29] assessed care recipient behavioral problems.[29,38] St-Onge & Lavoie[30] assessed care recipients' negative symptoms resulting from their disorder (Life Skills Profile).[39] Thus, between-study variability may be due to the difference of operationalizing care recipient functioning. And as previously discussed, all three studies used different measures for caregiver burden, further facilitating the differences in effect sizes across the three studies.

Factor: Parent Age	N	Parent Age Measure	Measure of Caregiver Burden	*r*
Cook *et al.* (1994)	222	Age in years	Parental burden: Connection[a]	0.14
			Parental burden: Cognitive[a]	0.12
			Parental burden: Responsible[a]	0.16
			Parental burden: Behavior[a]	-0.17
			Parental burden: Disagree[a]	-0.05
			Parental burden: Future[a]	0.01
Greenberg *et al.* (1997)	73	Age in years	Burden (Time 1)[b]	-0.01
			Burden (Time 2) [b]	-0.07
			Depression (Time 1)[c]	0.09
			Depression (Time 2) [c]	-0.03
St-Onge & Lavoie (1997)	99	Age in years	Psychological distress[d]	-0.09
			Daily and social life burden[e]	0.23
Factor: Parent Education	**N**	**Measure: Parent Education**	**Measure: Caregiver Burden**	***r***
Cook *et al.* (1994)	222	Years of formal schooling	Parental burden: Connection[a]	-0.26
			Parental burden: Cognitive[a]	-0.21

			Parental burden: Responsible[a]	-0.16
			Parental burden: Behavior[a]	-0.1
			Parental burden: Disagree[a]	0.01
			Parental burden: Future[a]	-0.2
St-Onge & Lavoie (1997)	99	Unspecified	Psychological distress[d]	0.01
			Daily and social life burden[e]	-0.04

Factor: Parent Health	N	Measure: Parent Health	Measure: Caregiver Burden	*r*
Cook *et al.* (1994)	222	Parent symptoms[f]	Parental burden: Connection[a]	0.33
			Parental burden: Cognitive[a]	0.36
			Parental burden: Responsible[a]	0.01
			Parental burden: Behavior[a]	0.37
			Parental burden: Disagree[a]	0.27
			Parental burden: Future[a]	0.2
St-Onge & Lavoie (1997)	99	Perceptions of health[g]	Psychological distress[d]	0.54
			Daily and social life burden[e]	0.25

Factor: Social Support	N	Measure: Social Support	Measure: Caregiver Burden	*r*
Greenberg *et al.* (1997)	73	Size of social network[k]	Burden (Time 1)[b]	-0.07
			Burden (Time 2) [b]	-0.14
			Depression (Time 1)[c]	0.24
			Depression (Time 2) [c]	-0.07
St-Onge & Lavoie (1997)	99	Confidant relationship[l]	Psychological distress[d]	-0.08
			Daily and social life burden[e]	-0.04
		Social support: Family[m]	Psychological distress[d]	-0.39
			Daily and social life burden[e]	-0.28
		Social support: Friends[m]	Psychological distress[d]	-0.09
			Daily and social life burden[e]	-0.29

Factor: Care Recipient Characteristics	N	Measure: Care Recipient Characteristics	Measure: Caregiver Burden	*r*
Cook *et al.* (1994)	222	Functional impairment[h]	Parental burden: Connection[a]	0.09
			Parental burden: Cognitive[a]	-0.01
			Parental burden: Responsible[a]	0.05
			Parental burden: Behavior[a]	-0.25
			Parental burden: Disagree[a]	-0.02
			Parental burden: Future[a]	-0.09
Greenberg *et al.* (1997)	73	Behavioral problems[i]	Burden (Time 1)[b]	0.49
			Burden (Time 2) [b]	0.27
			Depression (Time 1)[c]	0.24
			Depression (Time 2) [c]	0.06
St-Onge & Lavoie (1997)	99	Disability[j]	Psychological distress[d]	0.38
			Daily and social life burden[e]	0.42

Table 2. Measures and Correlation Coefficients Organized by Factor. [a]Thresholds Parental Burden Scale[42,43]; [b]Zarit Burden Interview[44]; [c]Center for Epidemiologic Studies Depression Scale (CES-D)[45]; [d]Psychiatric Symptom Index (PSI)[46,47]; [e]Cantor[48]; Pai and Kapur[49]; and Platt *et al.*[33]; [f]Symptom Checklist-90[50]; [g]items from Brook *et al.*[32]; Platt *et al.*[33]; [h]Global Assessment Scale[37]; [i]Bruininks, Hill, Weatherman, & Woodcock[38]; [j]Life Skills Profile (LSP)[39]; [k]Antonucci[34]; [l]Kaplan Intimacy and Adaptation Scale; adapted by Lin, Dean, and Ensel[36]; [m]Perceptions of social support from Friends and from Family[35]

DISCUSSION

This meta-analysis identified factors that predicted caregiver burden for parental caregivers of individuals with SMI. We used a three-level meta-analytic model to assess the impact of five factors: parent age, parent education, parent health, parent social support, and care recipient functioning. There were significant effects of parent health and social support on caregiver burden. Although there was not sufficient data to carry out moderator and mediator analysis, variance within and between studies was discussed qualitatively. We suggest that variability in measures used for caregiver burden and associated factors impacts associations between these variables. As such, we caution about generalizing findings in this field beyond specific measures. Further, we highlight the impact of parent health and social support on caregiver burden and note that associations with social support may be less subject to measurement variance.

As discussed previously, there was a very small number of studies that met the inclusion criteria of parent-child dyads of caregiving. Specifically, 106 studies were excluded because they assessed parent-child dyads within larger groups of familial caregivers, but did not provide separate analysis for parental caregivers. There is evidence that points to the differing effects of the nature of the relationship between caregiver and care recipient, and the burden experienced. For example, Chen & Lukens[51] found that sibling caregivers reported better emotional well-being in comparison to parent caregivers, and that parent caregivers reported more depressive symptoms than sibling caregivers. This suggests that the relationship between the caregiver and care recipient does, in some way, moderate the caregiving experiences and subsequent outcomes. While it would be relevant to assess differences across relational contexts, this was not possible for our analysis without original datasets for combined samples. Future research would benefit from separating or comparing the differential effects of caregiving in accordance with the relationship status between caregiver and care recipient. We hope that the present research will highlight the need for more research on parental caregivers of individuals with SMI.

For this meta-analysis only published data was used, which may have created sampling bias as data from gray literature were not included. Thus, the conclusions made in this study may not be representative of all data available on this topic. Further, a bias analysis on each included article was not conducted due to time constraints. Instead, sample characteristics in studies were noted and discussed as part of the qualitative analysis. Two of our studies only included mothers in their analysis rather than both parents; and although mothers more commonly take on the role of a primary caregiver, caution should be taken when generalizing our findings. Given that a very small number of studies met our inclusion criteria, and that the sample sizes of each included study were relatively small, there are further limitations with regards to the power of the analysis itself. This further limit the generalizability of our findings. Additionally, due to resource limitations, we did not consider searches yielding over 100 results. This may have impacted on the small number of studies identified that met the inclusion criteria. Despite these limitations, our systematic review highlights a dearth of literature focusing specifically on caregiver burden among parental caregivers of individuals with SMIs. Further, our findings indicate that parental health and social support significantly impacted caregiver burden—pointing towards potential aspects to focus on for future interventions and support programs.

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PRESS SUMMARY

This meta-analysis investigates the risk factors that most significantly exacerbate feelings of caregiver burden in parents providing care for their adult children with SMIs. The results showed that parental health and social support were significantly associated with caregiver burden, such that individuals with better health and more social support were less likely to experience caregiver burden. However, this investigation also identified a need for more research on caregiver burden experienced in parents caring for another with mental health disorders. A higher level of specificity in this research would greatly assist this high risk, but often overlooked, population.