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ORIGINAL PAPER

Satisfaction with Life Scale (SWLS) in Caregivers of Clinically-Referred Youth: Psychometric Properties and Mediation Analysis

M. Michele Athay

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Abstract This paper presents the psychometric evaluation of the Satisfaction with Life Scale (SWLS; Diener et al. in J Personal Assess 49:71–75, 1985) used with a large sample ($N = 610$) of caregivers for youth receiving mental health services. Methods from classical test theory, factor analysis, and item response theory were utilized. Additionally, this paper investigated whether caregiver strain mediates the effect of youth symptom severity on caregiver life satisfaction ($N = 356$). Bootstrapped confidence intervals were used to determine the significance of the mediated effects. Results indicated that the SWLS is a psychometrically sound instrument to be used with caregivers of clinically-referred youth. Mediation analyses found that the effect of youth symptom severity on caregiver life satisfaction was mediated by caregiver strain but that the mediation effect differed based on the type of youth symptoms: caregiver strain was a partial mediator when externalizing symptoms were measured and a full mediator when internalizing symptoms were measured. Implications for future research and clinical practice are discussed.

Keywords Life satisfaction · Caregivers · Mediation · Caregiver strain · Symptom severity · Youth mental health · SWLS · Psychometrics

M. Michele Athay (✉)
Center for Evaluation and Program Improvement, Vanderbilt University, Peabody #151, 230 Appleton Place, Nashville, TN 37203, USA
e-mail: Michele.Athay@vanderbilt.edu

Informal caregivers are unpaid persons who care for ill, disabled, or otherwise dependant persons. The recognition by researchers and practitioners of the central role these informal caregivers (hereafter 'caregivers') play in the mental health treatment of youth and adolescents has resulted in increased interest for studying them (Koroloff and Friesen 1997). Life satisfaction and caregiver strain are recognized as two important dimensions of the caregiver's general mental health status. Life satisfaction, a component of subjective well-being, is a cognitive judgment about the quality of one's life as a whole (Pavot and Diener 1993) and is generally lower in caregiver populations compared to non-caregiving norms (e.g., McConaghy and Caltabiano 2005; Moller-Liemkuhler 2005; Rivera et al. 2006; Ha et al. 2008). The term "caregiver strain" refers to the negative consequences and emotional impact that caring for a relative with special needs has on a caregiver.

One commonality between life satisfaction and caregiver strain is their relationship to the care recipient's symptom severity. Research demonstrates that the symptom severity of the care recipient is a significant predictor of both caregiver life satisfaction (e.g., Early et al. 2002) and caregiver strain (e.g., Sales et al. 2004). Despite these relationships with symptom severity, little research has investigated the inter-relationships between all three of these variables. The present study examined caregiver strain as a potential mediator of the relationship between youth symptom severity and caregiver life satisfaction in caregivers of youth receiving mental health treatment. Given the importance of using sound instruments for measurement, this study also presents a thorough psychometric evaluation of the Satisfaction with Life Scale (SWLS; Diener et al. 1985) with a large sample of caregivers of youth receiving mental health services.

Life Satisfaction and Symptom Severity

Depending on needs of the care recipient, caregivers can face various challenging and stressful caregiving tasks. As such, it is not surprising that previous research documents a significant, negative relationship between life satisfaction (an indicator of well-being) and the care recipient's symptom severity. This has been found in various special needs populations, including caregivers of individuals with multiple sclerosis (Waldrone-Perrine et al. 2009), dementia (Perren et al. 2007), and traumatic brain injury (Vangel et al. 2011). Although those studies focus on caregivers of adults with special needs, the relationship between symptom severity and life satisfaction is also evident in caregivers for child populations. For example, Ekas and Whitman (2010) found that higher symptom severity in children with autism predicted lower life satisfaction in their caregivers. Similarly, Early et al. (2002) examined the well-being of caregivers of children with emotional problems and found that the children's symptoms and functioning significantly related to caregivers' well-being. This relationship was also found in caregivers of children with spina bifida (Grosse et al. 2009). These studies all provide evidence documenting a significant, negative relationship between caregiver life satisfaction and the severity of youths' problems.

Caregiver Strain and Symptom Severity

In addition to predicting life satisfaction, symptom severity also significantly relates to caregiver strain. Higher caregiver strain has been found to relate to higher symptom severity in individuals with multiple sclerosis (Khan et al. 2007), Alzheimers (Mohamed et al. 2010) and intellectual disability (White and Hastings 2004). A significant relationship between caregiver strain and caregiver symptom severity is also found in caregivers of children with several special needs, including obsessive–compulsive disorder (Storch et al. 2009), emotional problems (Sales et al. 2004), and Tourette's Syndrome (Schoeder and Remer 2007). This relationship has also been replicated in a study of caregivers of children with mental health disorders (Heflinger and Brannan 2006) as well as for caregivers of children with substance use disorders (Brannan and Heflinger 2006). The relationship between caregiver strain and symptom severity also appears to differ when internalizing versus externalizing symptoms are measured. Research has demonstrated that the relationship between youth symptoms and maternal distress (e.g., caregiver strain) was a function of mostly externalizing symptoms as opposed to internalizing symptoms (Ekas and Whitman 2010; Hastings et al. 2006).

Life Satisfaction and Caregiver Strain

Evidence has also demonstrated a link between caregiver strain and life satisfaction. For example, in their 2007 research paper, Khan et al. found that caregivers of persons with multiple sclerosis reporting high levels of caregiver strain also experienced lower overall quality of life and well being. Similarly, in a study of caregivers for the elderly, Iecovich (2008) found that caregiver strain affected quality of life in a negative direction. Although the constructs of quality of life (QOL) and well-being are not synonymous with satisfaction with life (SWL), they are intimately related to life satisfaction: QOL and well-being are often used interchangeably and SWL is a component of well-being (Pavot and Diener 1993). Therefore, it is reasonable to expect caregiver strain to demonstrate a similar, negative, relationship to SWL.

Current Study

Figure 1 represents the established relationships between caregiver life satisfaction, youth symptom severity, and caregiver strain: symptom severity predicting both caregiver strain (path a) and life satisfaction (path c) and caregiver strain predicting life satisfaction (path b). Despite the research supporting the relationship between pairs of these three variables, no published research was found that examined the interrelationship between all three variables and whether a mediational relationship exists whereby caregiver strain mediates the relationship between symptom severity and life satisfaction. It is unclear how much of the effect symptom severity has on life satisfaction is a direct effect or indirect effect by way of caregiver strain. The current study investigates caregiver strain as a potential mediator between the effects of symptom severity on caregiver life satisfaction. Given prior research on the differential relationship between different types of symptoms and maternal distress, two separate analyses will be conducted for internalizing and externalizing symptom severity.

Although caregiver strain is often studied in caregivers of youth referred to mental health services (e.g., Brannan

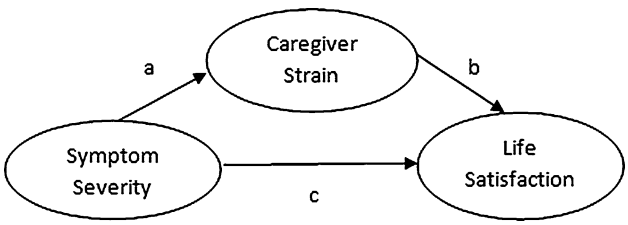

Fig. 1 Theoretical model of the predicted relationships between symptom severity, caregiver strain, and caregiver life satisfaction

and Heflinger 2006), relatively few have investigated life satisfaction in this population. As such, the psychometric properties of the SWLS (Diener et al. 1985), the most popular measure of life satisfaction, have yet to be published for the current population. Therefore, a secondary purpose of this paper is to evaluate the psychometric properties of the SWLS in a large sample of caregivers for clinically-referred youth.

Method

Participants

Participants were drawn from a larger study evaluating the effects of a measurement feedback system (Contextualized Feedback Systems™) on youth outcomes. This sample represents 28 regional offices in 10 different states comprising part of a large national provider for home-based mental health services. The sample for the current paper included all caregivers of youth included in the larger study's evaluation. These are caregivers for youth who began treatment during the two and a half year data collection period. Additionally, inclusion for this study included having at least one valid caregiver SWLS measure (defined as having 85% non-missing item responses). This resulted in a final sample of 288 caregivers of youth receiving mental health treatment. The first time point in which SWLS data was present for each caregiver was used in this analysis. Data were also gathered from an additional 322 caregivers of youth receiving services from the same national provider (other than those included in the evaluation study) for the psychometric study of the SWLS. This resulted in a total of $N = 610$ caregivers included in the psychometric evaluation. Please see Riemer et al. (2012) in this issue for more information about the differences between these two samples.

Measures

Satisfaction with Life Scale

The SWLS was developed by Diener et al. (1985) and is the most popular scale for measuring SWL (Diener et al. 1999; Vassar et al. 2008). There are five items: "In most ways my life is close to my ideal"; "The conditions of my life are excellent"; "I am satisfied with my life"; "So far I have gotten the important things I want in my life"; and "If I could live my life over, I would change almost nothing". Respondents are asked to answer each item on a 7-point Likert-type scale (from 1 = *strongly disagree* to 7 = *strongly agree*). Answers are added to create summary score from 5 to 35 or an average of item responses (1–7). Pavot and Diener (2008) report an average item score of 4 as 'neutral', >6.2 indicating 'extremely satisfied' and <2 as 'extremely dissatisfied'. The SWLS has a reported Cronbach's alpha for internal consistency of 0.87, a test–retest correlation of 0.82, and a single factor solution replicated through factor analysis (Diener et al. 1985; Neto 1993).

Symptom Severity

The Symptoms and Functioning Severity Scale (SFSS: Bickman et al. 2010) is completed by the clinician, caregiver, and youth at baseline and bimonthly during treatment. Composed of 26 five-point Likert-type items (27 for the clinician version), it yields a Total Score of global symptom severity as well as subscale scores for internalizing and externalizing symptoms. The SFSS has demonstrated sound psychometric qualities for all three respondent forms, including internal consistency (range: Cronbach alpha = 0.93–0.94), test–retest reliability (range: r = 0.68–0.87), construct validity, and convergent and discriminant validity. The SFSS also has established cutoffs for low, medium, and high scores. For the caregiver version, a score of 73 or more is considered high severity, a score between 58 and 73 is medium severity, and a score less than 58 is low severity. Based on youth ratings, a score above 63 is high, 45–63 is medium, and less than 45 is low. Clinician ratings indicate a score above 69 is high, 57–69 is medium and less than 57 is low. For more information about the psychometric qualities of the SFSS, see the Peabody Treatment Progress Battery (PTPB; Bickman et al. 2010) or Athay et al. (2012) in this issue.

Caregiver Strain Questionnaire-Short Form-7

Composed of seven items from the original CGSQ (Brannan et al. 1997), the Caregiver Strain Questionnaire-Short Form-7 (CGSQ-SF7) assesses the extent to which caregivers experience objective and subjective strain as a result of caring for a child with mental health difficulties. It yields a Total Score and two subscale scores (Objective and Subjective Strain). Total Scores above 7.0 are considered high, scores between 3.8 and 7.0 are moderate, and scores less than 3.8 are considered low. The CGSQ-SF7 displays excellent psychometric properties including an internal consistency coefficient of 0.89 (Bickman et al. 2010). See Brannan et al. (2012) in this issue for more information on the CGSQ-SF7.

Procedures

Caregivers completed the SWLS, CGSQ-SF7, and SFSS as part of a battery of measures (the PTPB) used to assess

youth treatment progress and process. Measures in the PTPB were completed at the end of the clinical session. In the current study, caregivers' first completed (defined as 85% non-missing item responses) SWLS along with a completed CGSQ-SF7 and SFSS collected the same month were used. Data were received deidentified after a rigorous data processing protocol (see Bickman et al. 2010). The Institutional Review Board of Vanderbilt University granted approval.

Data Preparation

With the exception of the psychometric portion of this paper, multiple imputations (MI) were used to treat missing data from the SFSS and CGSQ-SF7. The assumption that data are missing at random (MAR) is important in the application of multiple imputation procedures. Following procedures suggested by McKnight et al. (2007), missing data across subjects and variables were inspected and no discernable patterns of missingness were found that would indicate non-MAR. Established guidance is that five imputations suffice for MI procedures (Rubin 1987; von Hippel 2005); thus, missing data were treated as MAR and five imputed data sets were created to use separately for analyses. Averaged results are presented.

Analyses-Psychometric Study

For the evaluation of the psychometric properties of the SWLS, classical test theory (CTT), confirmatory factor analysis (CFA) and item response theory (IRT) methods were applied. These methods provide information concerning psychometric qualities of individual items as well as the overall scale. CTT and CFA analyses were conducted with SAS® version 9.2 software, IRT analyses utilized WINSTEPS 3.36.0 (Linacre 2007). For more detailed information, see Riemer et al. (2012) in this issue.

Within CTT, the characteristics of each SWLS item were inspected through analysis of its distributional characteristics and relationship to the SWLS Total Score. Additionally, the Total Score was described with summary statistics and an indicator of the internal reliability (i.e., Cronbach's coefficient alpha). By observing the correlation between each item and the Total Score, items that are unrelated to the measure can be identified by low correlations.

The SWLS was developed as a unidimensional scale measuring one construct. Therefore, all item responses are combined to create one Total Score representing the respondent's level of life satisfaction. The interpretations made from this score are valid as long as the assumption that the measure is unidimensional remains true. In the current sample, CFA was used where all items load on only one latent variable to evaluate whether the data support this unidimensional model.

Although several different IRT models have been developed, the rating scale model (RSM) with polytomously scored items (Andrich 1978) was used in the current paper. Application of the RSM yields item difficulty ratings and item fit statistics (infit and outfit). Item difficulties show where an item is most precise in estimating the level of service satisfaction (on a logit scale). Fit statistics quantify how well an item fits with the proposed model. Although the RSM is a 1-parameter logistic model, WINSTEPS 3.63.0 (Linacre 2007) provides an estimate of each item's discrimination, or its ability to differentiate persons with high and low life satisfaction.

Analyses-Mediation Study

In order to test the hypothesis that caregiver strain mediates the relationship between youth symptom severity and caregiver life satisfaction, hierarchical regression analyses were conducted as described by Baron and Kenny (1986). Separate models were conducted for internalizing and externalizing symptom severity. Methods described by Preacher and Hayes (2004) were used to bootstrap confidence intervals in order to determine the significance of the mediatory relationship. Analyses utilized the MBESS package (Kelley 2007) in R (R development core team 2010).

Results

Psychometric Study

A total of 610 caregivers completed the SWLS in the psychometric sample. Total Score and comprehensive item analysis for the SWLS are found in Table 1. The mean Total Score for caregivers was 4.41 (SD = 1.55) and the score distribution was approximately normally distributed with no demonstrating significant skewness or kurtosis. The scale demonstrated a satisfactory degree of internal consistency (Cronbach's alpha = 0.90) with item-total correlations ranging from 0.64 to 0.82.

To aid in score interpretation, SWLS Total Scores can be classified as 'high', 'medium', and 'low' according to the 25th and 75th percentiles. In this sample, scores less than 3.4 are considered low and scores higher than 5.6 are considered high. Scores at or between 3.4 and 5.6 are considered moderate. Based on the internal reliability of the scale and the standard error of measurement an index of minimum detectable change (MDC) was calculated. This indicates, with 75% confidence, a change of 0.82 SWLS points between two measure administrations is not due to

Table 1 Item and Total Score analysis of SWLS for a sample of caregivers of clinically-referred youth ($N = 610$)

Item	Mean	SD	Skew	Kurtosis	CFA	Corr	Measure	Infit	Outfit	Discrim
1	4.41	1.85	−0.44	−1.08	0.81	0.75	0.01	0.97	1.00	1.10
2	4.20	1.79	−0.21	−1.09	0.84	0.78	0.21	0.81	0.84	1.13
3	4.66	1.83	−0.54	−0.90	0.89	0.82	−0.24	0.74	0.77	1.24
4	4.91	1.74	−0.79	−0.46	0.76	0.72	−0.51	1.07	1.05	0.97
5	3.88	2.00	0.03	−1.34	0.67	0.64	0.52	1.42	1.41	0.58
Total	4.41	1.55	−0.39	−0.72	–	–	–	–	–	–

SD = standard deviation, CFA = confirmatory factor analysis standardized factor loadings, Corr = correlation with total, Measure = item difficulty, Discrim = discrimination

chance or simply the result of measurement error in this population.

Results from application of the RSM to the data are also found in Table 1. Item difficulties ranged from −0.51 to 0.52 on a logit scale. This indicates that all five items are located at the center of the latent continuum. Thus, according to an IRT perspective, the SWLS is most precise at the center of the continuum and less precise moving away (higher or lower) from this middle. However, this grouping of items on one portion of the latent continuum is typical in clinical measures and presents some unique challenges in clinical measurement within the IRT framework (Reise and Waller 2009). In terms of RSM fit indices, it is generally desirable to have infit and outfit values between 0.6 and 1.4 (Wright and Linacre 1994). Although the fit indices were slightly out of range for item five ("I wouldn't change anything"), inclusion of item five may not be problematic to the scale as a whole. The majority of items display adequate discrimination indices (i.e., values close to one); however, the discrimination index of item five is slightly lower than desired. This indicates that item five has difficulty differentiating caregivers with low versus high life satisfaction. Again, this may not be problematic to the scale as a whole.

Confirmatory factor analysis indicated the proposed one-factor model fit the data (Bentler CFI = 0.99; Joreskog GFI = 0.99; SRMR = 0.02). This confirms that the SWLS is measuring only one construct. Standardized factor loadings ranged from 0.67 to 0.89. Overall, results suggest the SWLS is a psychometrically sound instrument for use in this population. For more information, see Bickman et al. 2010.

Mediation Study

Life Satisfaction, Caregiver Strain, and Symptom Severity

The sample used in the mediation study had a mean SWLS Total Score of 4.26 (SD = 1.52). This mean is lower than norms reported by Pavot and Diener (2008) for college students ($M = 4.78$, SD = 1.16, $t = 4.43$, $p < 0.001$). However, the caregivers in the current study have similar mean levels of SWL as compared to levels reported in other caregiver populations, such family caregivers of women with physical disabilities ($M = 4.26$, SD = 1.72, $t = 0.79$, $p = 0.43$; Rivera et al. 2006) and caregivers of the elderly ($M = 4.24$, SD = 1.54, $t = 1.10$, $p = 0.27$; Vitaliano et al. 1991). This sample had a mean CGSQ-SF7 Total Score of 6.16 (SD = 2.14). Caregivers reported youth to have a mean SFSS Externalizing Score of 52.78 (SD = 11.76) and a mean SFSS Internalizing Score of 50.55 (SD = 11.09).

Pearson correlations were computed to examine the relationship between caregiver life satisfaction, youth symptom severity (internalizing and externalizing symptoms), and caregiver strain as measured by the SWLS, SFSS, and CGSQ-SF7 respectively (see Table 2). As predicted, caregiver strain was significantly negatively correlated with SWLS ($r = -0.28$, $p < 0.01$), indicating higher caregiver strain was related to lower life satisfaction. Consistent with the literature, caregiver strain correlated higher with externalizing symptoms ($r = 0.65$, $p < 0.001$) compared to internalizing symptoms ($r = 0.29$, $p < 0.001$), although both correlations were significant and positive. Higher symptom severity was related to higher

Table 2 Intercorrelations between SWLS, CGSQ-SF7 and SFSS (caregiver report)

Measure	SWLS	CGSQ-SF7
Satisfaction with Life (SWLS)	–	
Caregiver Strain (CGSQ-SF7)	−0.28**	–
Externalizing Symptom Severity (SFSS Externalizing Subscale)	−0.30**	0.65**
Internalizing Symptom Severity (SFSS Internalizing Subscale)	−0.18**	0.29**

** $p < 0.01$

caregiver strain and vice versa. Caregiver SWLS was also significantly correlated with both externalizing ($r = -0.30$, $p < 0.001$) and internalizing ($r = -0.18$, $p < 0.001$) symptom severity, with a stronger correlation relating SWL to externalizing symptoms. It appears that externalizing symptom severity has a stronger relationship with life satisfaction. These significant associations between the variables of interest (life satisfaction, internalizing and externalizing symptom severity, and caregiver strain) are consistent with current hypotheses.

Mediation Analysis

Baron and Kenny (1986) note that the following four conditions must be met to establish mediation: (1) the initial variable (Symptom Severity: SFSS Externalizing and Internalizing Scores) is a significant predictor of the outcome (Life Satisfaction: SWLS); (2) the initial variable (SFSS Externalizing and Internalizing Scores) is a significant predictor of the mediator (Caregiver strain: CGSQ-SF7); (3) the mediator (CGSQ-SF7) is a significant predictor of the outcome variable (SWLS) when controlling for the initial variable (SFSS Externalizing and Internalizing Scores); (4) Complete mediation occurs when step three reduces the relationship between the initial variable (SFSS Externalizing and Internalizing Scores) and outcome (SWLS) to zero. The current study predicted that both SFSS Internalizing and Externalizing Scores would significantly predict CGSQ-SF7 Total Scores and SWLS Total Scores. Additionally, it is predicted that the relationship between the SFSS subscales and SWLS would decrease in significance when the SWLS is regressed on each SFSS subscale and the CGSQ-SF7, indicating mediation. Based on aforementioned research that demonstrated a stronger relationship between externalizing symptoms and caregiver strain, this study predicts that the mediatory relationship will be larger in the externalizing SFSS model.

As hypothesized, results indicated that externalizing symptom severity significantly predicted life satisfaction ($\beta = -0.039$, $p < 0.001$, 95% CI $= -0.053, -0.025$) and caregiver strain ($\beta = 0.109$, $p < 0.001$, 95% CI $= 0.093, 0.125$; see Fig. 2). When life satisfaction was regressed on caregiver strain and externalizing symptom severity, both externalizing symptoms ($\beta = -0.028$, $p < 0.001$, 95% CI $= -0.045, -0.010$) and caregiver strain ($\beta = -0.112$, $p < 0.001$, 95% CI $= -0.209, -0.015$) remained significant. From condition 1 to condition 3, the beta for life satisfaction reduced from -0.039 to -0.028 but remained significant, suggesting a partial mediation effect (Baron and Kenny 1986). This indicates that, controlling for caregiver strain, there remains a direct relationship between youth externalizing symptom severity and caregiver life satisfaction. Based on this coefficient (see Fig. 2),

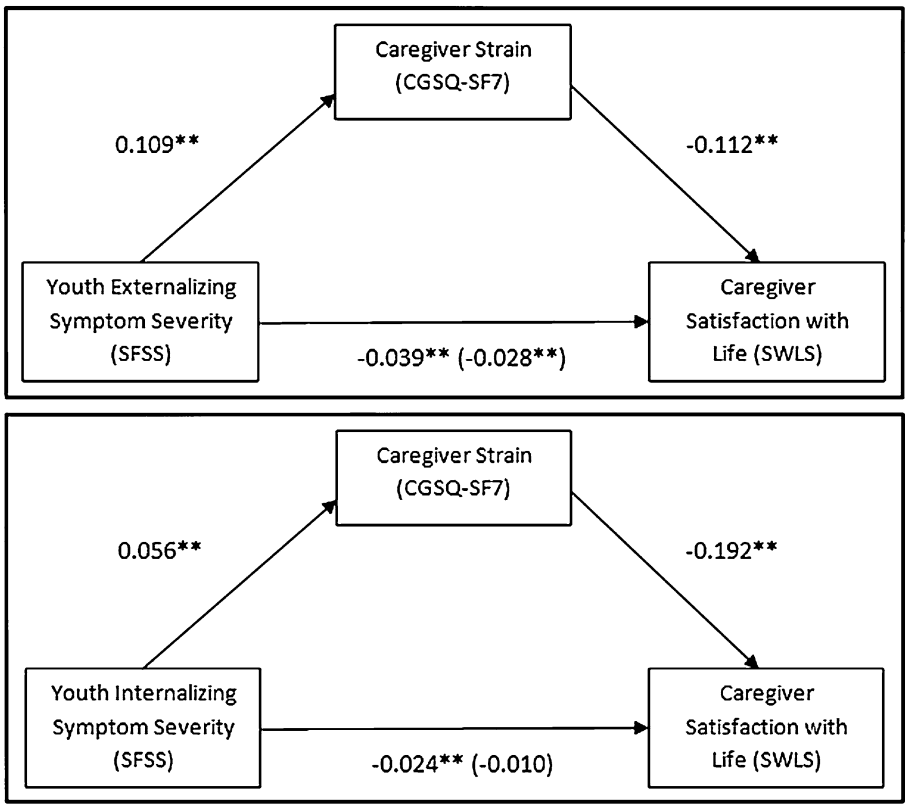

Fig. 2 Unstandardized regression coefficients for the relationship between caregiver-rated youth symptom severity (SFSS) and caregiver satisfaction with life (SWLS) as mediated by caregiver strain (CGSQ-SF7). The unstandardized regression coefficient between SFSS (internalizing symptoms upper panel; externalizing symptoms lower panel) and SWLS controlling for CGSQ-SF7 is in parentheses. Note: $^{**}p < 0.001$, $^{*}p < 0.05$

a caregiver reporting an externalizing score two standard deviations above the mean (2 * 11.76 = 23.5), the caregiver's SWLS would be predicted to be approximately 0.66 points lower (23.5 * −0.028 = 0.66) compared to a caregiver reporting the average SFSS score, when controlling for caregiver strain.

The results also indicated that internalizing symptom severity significantly predicted life satisfaction ($\beta = -0.024$, $p < 0.001$, 95% CI = −0.039, −0.009) and caregiver strain ($\beta = 0.056$, $p < 0.001$, 95% CI = 0.036, 0.077; see Fig. 2). When life satisfaction was regressed on caregiver strain and internalizing symptom severity, caregiver strain remained significant ($\beta = -0.192$, $p < 0.001$, 95% CI = −0.273, −0.110) but internalizing symptom severity became insignificant ($\beta = -0.010$, $p > 0.05$, 95% CI = −0.025, 0.006). From condition 1 to condition 3, the beta for life satisfaction reduced from −0.024 to −0.010 and became insignificant, suggesting a full mediation effect (Baron and Kenny 1986). This indicates that, the relationship between internalizing symptom severity and life satisfaction is completely accounted for by caregiver strain.

The bootstrapping method discussed in Preacher and Hayes (2004) and Hayes (2009) was used to compute a confidence interval around each estimate of the indirect effect. This approach is preferred over the approach of Baron and Kenny (1986) because of its increased power (MacKinnon et al. 2002) and over the Sobel test because it does not make the often unrealistic assumption about normality in the sampling distribution of the indirect effect. For each of the five imputed datasets 5000 bootstrap samples were drawn and 95% confidence intervals estimated. Results from the five bootstrap analyses were averaged together to produce final results. The mean estimate of the indirect effect in the externalizing symptom model was −0.012 (95% CI = −0.023, −0.002). This results in a decrease of −0.012 in SWLS units through CGSQ-SF7 for every point of externalizing symptom severity. The mean estimate of the indirect effect in the internalizing symptom model was −0.011 (95% CI = −0.017, −0.005), which indicates a decrease of −0.011 SWL units through caregiver strain, for every point of internalizing symptom severity. Evidence of mediation is present given these confidence interval do not include zero.

Preacher and Kelley (2011) suggest the use of Kappa Squared as a measure of effect size for the indirect effect. Kappa Squared is the ratio of the indirect effect to the maximum possible size the indirect effect could have been, given the variances. In the current analysis, the Kappa Squared equaled 0.079 (95% CI = 0.020, 0.147) in the externalizing symptom model and 0.077 (95% CI = 0.040, 0.119) in the internalizing symptom model. These are medium effect sizes according to Cohen's (1988) guidelines.

Discussion

In the first portion of this paper, the psychometric properties of the SWLS (Diener et al. 1985) was assessed when used with caregivers of youth aged 11–18 receiving mental health services. This measure provides an overall score for the respondent's cognitive judgment concerning the quality of their life as a whole. The use of multiple methods in this psychometric evaluation allowed for a greater understanding about how this measure and corresponding items function in this population. Additionally, multiple methods provides more evidence concerning the validity of the measure than a single method would yield.

Overall, the results suggest the psychometric properties of the SWLS are satisfactory for caregivers of youth receiving mental health services. SWLS Total Scores and individual items were approximately normally distributed in the intended population. The SWLS was found to have high internal consistency, adequate item-total correlations, and confirmation of the proposed single-factor solution model based on model fit indices in CFA. Application of the Rasch measurement model indicated the items fit the RSM reasonably well and, thus, demonstrated good scale characteristics. Although item five has slightly less than satisfactory fit with the model, this slight deviation from desired levels is most likely not problematic for the scale as a whole. The location of SWLS items within close proximity to one another indicated that SWLS is most precise measuring the center of the latent continuum. Future work may investigate further item creation in order to include items that cover the entire continuum. However, as mentioned earlier, this is a common problem in clinical measurement (Reise and Waller 2009). Further validation research is needed given that scale validation is a never-ending and circular process (Hubley and Zumbo 1996). Additionally, further analyses are needed to evaluate the predictive validity and sensitivity to change of the SWLS in this population.

In the second section of the current study, the relationship between youth symptom severity, caregiver strain, and caregiver life satisfaction was examined. Consistent with previous findings (e.g., Early et al. 2002; Sales et al. 2004), lower levels of life satisfaction were associated with higher youth externalizing and internalizing symptom severity (as reported by the caregiver) and higher caregiver strain. Mediation analyses suggested that caregiver strain is a partial mediator for the effect of externalizing symptom severity on caregiver SWL and a full mediator for the effect of internalizing symptom severity on caregiver SWL. These findings provide initial evidence that caregiver strain is one pathway through which the severity of youth's symptoms impacts caregiver life satisfaction. Both mediation effects were found to be medium in size. Given that

life satisfaction has been shown to be a relatively stable construct over time (Fujita and Diener 2005; Heller et al. 2006; Pavot and Diener 2008), these medium effects may be clinically significant if the mediator variable is sensitive to treatment. This will be discussed further under the *clinical implications* section.

Results of mediation analyses did not support the hypothesis for a stronger mediatory relationship for externalizing symptom severity compared to internalizing symptom severity. In fact, the indirect effects were nearly identical between these two types of symptom severity. The difference, however, was that in the externalizing symptom severity analysis, caregiver strain was a partial mediator whereas in the internalizing symptom severity analysis it was a full mediator. While youth's externalizing behavior, such as throwing things, having outbursts, and being inattentive, impacts life satisfaction through its relationship to caregiver strain, these behaviors exhibit an effect on life satisfaction over and above those directed through caregiver strain. This indicates that even controlling for caregiver strain, there remains either a direct effect of youth's externalizing symptoms on life satisfaction or another variable that mediates the relationship. Given the significant relationship between youth externalizing symptoms and maternal depression (Kouros and Garber 2010), maternal depression may be another mediator that directs the relationship between externalizing symptoms and life satisfaction. In fact, Youngstrom et al. (1999) found strong evidence that mother's descriptions of child functioning are biased by maternal depression. This is also consistent with the finding that adults with emotional, behavioral or substance disorders have lower life satisfaction than those without such disorders (Arrindell et al. 2001; Meyer et al. 2004; Siedlecki et al. 2008). Future work is needed to determine the presence of other mediators between externalizing symptoms and caregiver life satisfaction. The current discussion suggests maternal depressive symptoms as a starting point.

Clinical Implications

SWL ratings are thought to be based on "chronically assessable" information and thus ratings display a modest stability over a person's life (Fujita and Diener 2005; Heller et al. 2006; Pavot and Diener 2008). In this way, the influence of mood has been shown to have a relatively small contribution to assessments of SWL compared to a more stable, underlying cognitive judgment (Pavot and Diener 2008). However, research has shown stressful life events can produce changes in SWL (Fujita and Diener 2005; Lucas et al. 2003; Pavot and Diener 2008). Caring for a child with mental health challenges can certainly be considered a stressful life event. Based on the established relationship between youth symptom severity and SWL, it appears that the severity of symptoms and the youth's functioning contribute to this stress, which ultimately has an impact on the caregivers' overall life satisfaction. However, this also means that there is potential for the caregivers' life satisfaction to increase as the youth improves throughout the course of treatment. In an article currently under review (Athay, under review) evidence suggests just that: caregiver SWL increased over time as the youth improved in treatment. But, results of the current mediation analysis demonstrate that attending to caregiver strain (CGSQ-SF7) may be another way of increasing caregiver life satisfaction. Interventions or treatment specifically targeting caregiver strain may lessen the impact that youth's symptoms have on the caregivers' SWL. Several such interventions already exist (for example, see Mendenhall and Mount 2011), with others proposed (e.g., see Van Hooser Suiter and Heflinger 2011). It is important for clinicians to tend to caregiver experiences as they navigate the choppy waters of caring for a child with mental health issues.

Limitations

There are several important limitations to mention. First, this cross-sectional analysis utilized data collected at the beginning of the youth's treatment. Future studies are needed to investigate whether caregiver strain mediates the relationship between youth symptom severity and caregiver life satisfaction in the same way throughout the youth's treatment. Another limitation of the study is that the sample consisted of caregivers of youth who are receiving in-home community mental health treatment. These results may not generalize to other populations of caregivers such as those of youth who are served in clinics or residential settings. Finally, although many youth outcomes (e.g., overall symptoms, internalizing and externalizing symptoms, specific symptom categories) may be measured by several different respondents (clinician, caregiver, youth, teacher), the current study only investigated caregiver-rated internalizing and externalizing symptoms. Thus, the current results may not generalize to other outcomes or other respondent perspectives.

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References

R Development Core Team. (2010). R: A language and environment for statistical computing, reference index version 2.11.1. R Foundation for Statistical Computing, Vienna, Austria. URL http://www.R-project.org.

Andrich, D. (1978). A rating formulation for ordered response categories. *Psychometrika, 43*, 561–573.

Arrindell, W. A., van Nieuwenhuizen, C., & Luteijn, F. (2001). Chronic psychiatric status and satisfaction with life. *Personality and Individual Difference, 31*, 145–155.

Athay, M. M. (under review). Life satisfaction projections in caregivers for clinically-referred youth: Relationship to youth symptoms severity during treatment. Manuscript submitted for publication.

Athay, M.M., Riemer, M., & Bickman, L. (2012). The symptoms and functioning severity scale (SFSS): Psychometric evaluation and discrepancies among youth, caregiver, and clinician ratings over time. *Administration and Policy in Mental Health and Mental Health Services Research*. doi:10.1007/s10488-012-0403-2.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173–1182.

Bickman, L., Athay, M. M., Riemer, M., Lambert, E. W., Kelley, S. D., Breda, C., Tempesti, T., Dew-Reeves, S. E., Brannan, A. M., Vides de Andrade, A. R. (eds). (2010). *Manual of the peabody treatment progress battery*, 2nd ed. [Electronic version]. Nashville, TN: Vanderbilt University. http://peabody.vanderbilt.edu/ptpb.

Brannan, A. M., Athay, M. M., & Vides de Andrade, A. R. (2012). Measurement quality of the Caregiver Strain Questionnaire-Short Form 7 (CGSQ-SF7). *Administration and Policy in Mental Health and Mental Health Services Research*. doi: 10.1007/s10488-012-0412-2.

Brannan, A. M., & Heflinger, C. A. (2006). Caregiver, child, family, and service system contributors to caregiver strain in two child mental health service systems. *The Journal of Behavioral Health Services & Research, 33*, 408–422.

Brannan, A. M., Heflinger, C. A., & Bickman, L. (1997). The Caregiver Strain Questionnaire: Measuring the impact on the family of living with a child with serious emotional disturbance. *Journal of Emotional and Behavioral Disorders, 5*, 212–222.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). New York: Academy Press.

Diener, E., Emmons, R. A., Larson, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49*, 71–75.

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin, 125*, 276–302.

Early, T. J., Gregoire, T. K., & McDonald, T. P. (2002). Child functioning and caregiver well-being in families of children with emotional disorders: A longitudinal analysis. *Journal of Family Issues, 23*, 374–391.

Ekas, N., & Whitman, T. L. (2010). Autism symptom topography and maternal socioemotional functioning. *American Journal on Intellectual and Developmental Disabilities, 115*(3), 234–249.

Fujita, F., & Diener, E. (2005). Life satisfaction set point: Stability and change. *Journal of Personality and Social Psychology, 88*, 158–164.

Grosse, S. D., Flores, A. L., Ouyang, L., Robbins, J. M., & Tilford, J. M. (2009). Impact of spina bifida on parental caregivers: Findings from a survey of Arkansas families. *Journal of Child and Family Studies, 18*, 574–581.

Ha, J., Hong, J., Seltzer, M. M., & Greenberg, J. S. (2008). Age and gender differences in the well-being of midlife and aging parents with mental health or developmental problems: Report of a national study. *Journal of Health and Social Behavior, 49*(3), 301–316.

Hastings, R. P., Daley, D., Burns, C., Beck, A., & MacLean, W. E., Jr. (2006). Maternal distress and expressed emotion: Cross-sectional and longitudinal relationships with behavior problems of children with intellectual disabilities. *American Journal of Mental Retardation, 111*, 48–61.

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76*, 408–420.

Heflinger, C. A., & Brannan, A. M. (2006). Differences in the experience of caregiver strain between families caring for youth with substance use disorders and families of youth with mental health problems. *Journal of Child and Adolescent Substance Use, 15*(3), 83–104.

Heller, D., Watson, D., & Ilies, R. (2006). The dynamic process of life satisfaction. *Journal of Personality, 74*, 1421–1450.

Hubley, A. M., & Zumbo, B. D. (1996). A dialectic on validity: Where we have been and where we are going. *The Journal of General Psychology, 123*, 207–215.

Iecovich, E. (2008). Caregiving burden, community services, and quality of life of primary caregivers of frail elderly persons. *Journal of Applied Gerontology, 27*, 309–330.

Kelley, K. (2007). Methods for the Behavioral, Educational, and Social Sciences: An R Package. *Behavior Research Methods, 39*, 979–984.

Khan, F., Pallant, J., & Brand, C. (2007). Caregiver strain and factors associated with caregiver self-efficacy and quality of life in a community cohort with multiple sclerosis. *Disability and Rehabilitation, 29*, 1241–1250.

Koroloff, N., & Friesen, B. (1997). Challenges in conducting family-centered mental health services research. *Journal of Emotional and Behavioral Disorders, 5*, 130–137.

Kouros, C. D., & Garber, J. (2010). Dynamic associations between maternal depressive symptoms and adolescents' depressive and externalizing symptoms. *Journal of Abnormal Child Psychology, 38*, 1069–1081.

Linacre, J. M. (2007). WINSTEPS® 3.63.0 [Computer software]. Retrieved Jan 8, 2007, from http://www.winsteps.com/index.htm.

Lucas, R. E., Clark, A. E., Georgellis, Y., & Diener, E. (2003). Re-examining adaptation and the set point model of happiness: Reactions to changes in marital status. *Journal of Personality and Social Psychology, 84*, 527–539.

MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods, 7*, 83–104.

McConaghy, R., & Caltabiano, M. L. (2005). Caring for a person with dementia: Exploring relationships between perceived burden, depression, coping and well-being. *Nursing and Health Sciences, 7*, 81–91.

McKnight, P. E., McKnight, K. M., Sidani, S., & Figueredo, A. J. (2007). *Missing data: A gentle introduction*. New York: Guilford Press.

Mendenhall, A. N., & Mount, K. (2011). Parents of children with mental illness: Exploring the caregiver experience and caregiver-focused interventions. *Families in Society, 92*, 183–190.

Meyer, C., Rumpf, H.-J., Hapke, U., & John, U. (2004). Impact of psychiatric disorders in the general population: Satisfaction with life and the influence of comorbidity and disorder duration. *Social Psychiatry Psychiatric Epidemiology, 39*, 435–441.

Mohamed, S., Rosenheck, R., Lyketsos, C. G., & Schneider, L. S. (2010). Caregiver burden in Alzheimer disease: Cross-sectional and longitudinal patient correlates. *The American Journal of Geriatric Psychiatry, 18*, 917–927.

Moller-Liemkuhler, A. M. (2005). Burden of relatives and predictors of burden. Baseline results from the Munich 5-year follow-up study on relatives of first hospitalized patients with schizophrenia or depression. *EurArch Psychiatry and Clinical Neuroscience, 255*, 223–231.

Neto, F. (1993). The Satisfaction with Life Scale: Psychometric properties in an adolescent sample. *Journal of Youth and Adolescence, 22*, 125–134.

Pavot, W., & Diener, E. (1993). Review of the Satisfaction with Life Scale. *Psychological Assessment, 5*, 164–172.

Pavot, W., & Diener, E. (2008). The Satisfaction with Life Scale and the emerging construct of life satisfaction. *The Journal of Positive Psychology, 3*, 137–152.

Perren, S., Schmid, R., Herrmann, S., & Wettstein, A. (2007). The impact of attachment on dementia-related problem behavior and spousal caregivers' well-being. *Attachment and Human Development, 9*, 163–178.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments and Computers, 36*, 717–731.

Preacher, K. J., & Kelley, K. (2011). Effect size measures for mediation models: Quantitative and graphical strategies for communicating indirect effects. *Psychological Methods, 16*, 93–115.

Reise, S. P., & Waller, N. G. (2009). Item response theory and clinical measurement. *Annual Review of Clinical Psychology, 5*, 27–48.

Riemer, M., Athay, M.M., Bickman, L., Breda, C., Kelley, S.D., & Vides de Andrade, A.R. (2012) The Peabody Treatment Progress Battery: History and methods for developing a comprehensive measurement battery for youth mental health. *Administration and Policy in Mental Health and Mental Health Services Research*. doi:10.1007/s10488-012-0404-1.

Rivera, P. A., Elliott, T. R., Berry, J. W., Shewchuk, R. M., Oswald, K. D., & Grant, J. (2006). Family caregivers of women with physical disabilities. *Journal of clinical Psychology Med Settings, 13*, 431–440.

Rubin, D. B. (1987). *Multiple imputation for nonresponse in surveys*. New York: Wiley.

Sales, E., Greeno, C., Shear, M. K., & Anderson, C. (2004). Maternal caregiving strain as a mediator in the relationship between child and mother mental health problems. *Social Work Research, 28*, 211–223.

Schoeder, C. E., & Remer, R. (2007). Perceived social support and caregiver strain in caregivers of children with Tourette's Disorder. *Journal of Child and Family Studies, 16*, 888–901.

Siedlecki, K. L., Tucker-Drob, E. M., Oishi, S., & Salthouse, T. A. (2008). Life satisfaction across adulthood: Different determinants at different ages? *The Journal of Positive Psychology, 3*, 153–164.

Storch, E. A., Lehmkuhl, H., Pence, S. L., Jr., Geffken, G. R., Ricketts, E., Storch, J. F., et al. (2009). Parental experiences of having a child with obsessive-compulsive disorder: Associations with clinical characteristics and caregiver adjustment. *Journal of Child and Family Studies, 18*, 249–258.

Van Hooser Suiter, S., & Heflinger, C. A. (2011). Issues of care are issues of justice: Reframing the experiences of family caregivers of children with mental illness. *Families in Society, 92*, 191–198.

Vangel, S. J., Rapport, L. J., & Hanks, R. A. (2011). Effects of family and caregiver psychosocial functioning on outcomes in persons with traumatic brain injury. *Journal of Head Trauma Rehabilitation, 26*, 20–29.

Vassar, M., Ridge, J. W., & Hill, A. D. (2008). Inducing score reliability from previous reports: An examination of life satisfaction studies. *Social Indic Research, 87*, 27–45.

Vitaliano, P. P., Russo, J., Young, H. M., Becker, J., & Maiuro, R. D. (1991). The screen for caregiver burden. *The Gerontologist, 31*, 76–83.

von Hippel, P. T. (2005). How many imputations are needed? A comment on Hershberger and Fisher (2003). *Structural Equation Modeling, 12*, 334–335.

Waldrone-Perrine, B., Rapport, L. J., Ryan, K. A., & Harper, K. T. (2009). Predictors of life satisfaction among caregivers of individuals with multiple sclerosis. *The Clinical Neuropsychologist, 23*, 462–478.

White, N., & Hastings, R. P. (2004). Social and professional support for parents of adolescents with severe intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities, 17*, 181–190.

Wright, B. D., & Linacre, J. M. (1994). Reasonable mean-square fit values. *Rasch Measurement Transactions, 8*, 370. Retrieved March 10, 2011 from www.rasch.org/rmt/rmt83b.htm.

Youngstrom, E., Izard, C., & Ackerman, B. (1999). Dysphoria-related bias in maternal ratings of children. *Journal of Consulting and Clinical Psychology, 67*, 905–916.