Research paper

Development and assessment of stressful life events subscales – A preliminary analysis

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ARTICLE INFO

ABSTRACT

Background: Stress affects people of all ages, genders, and cultures and is associated with physical and psychological complications. Stressful life events are an important research focus and a psychometrically valid measure could provide useful clinical information. The purpose of the study was to develop a reliable and valid measurement of stressful life events and to assess its reliability and validity using established measures of social support, stress, depression, anxiety and maternal and child health.
Methods: The authors used an adaptation from the Social Readjustment Rating Scale (SRRS) to describe the prevalence of life events; they developed a 4-factor stressful life events subscales and used Medical Outcomes Social Support Scale, Social Support Scale, Depression, Anxiety and Stress Scale and 14 general health items for validity analysis. Analyses were performed with descriptive statistics, Cronbach's alpha, Spearman's rho, Chi-square test or Fisher's exact test and Wilcoxon 2-sample test.
Results: The 4-factor stressful life events subscales showed acceptable reliability. The resulting subscale scores were significantly associated with established measures of social support, depression, anxiety, stress, and caregiver health indicators.
Limitations: The study presented a number of limitations in terms of design and recall bias.
Conclusions: Despite the presence of a number of limitations, the study provided valuable insight and suggested that further investigation is needed in order to determine the effectiveness of the measures in revealing the family's wellbeing and to develop and strengthen a more detailed analysis of the stressful life events/health association.

1. Introduction

Stress can be defined as "the non-specific response of the body to any demand for change" (Selye, 1936). Stress affects people of all ages, genders and cultures and is associated with physical and psychological complications such as heart disease, cancer, stroke (Cohen et al., 2007), depression, posttraumatic stress disorder (PTSD), pathologic aging (Green et al., 2010; Marin et al., 2011; Boardman and Alexander, 2011) and greater food consumption (Epel et al., 2001). Exposure to chronic stress in early life can significantly increase the risk of mental illness and somatic disturbances in adolescence and adulthood (Anda et al., 2006, 2007; Chapman et al., 2004; Cutrona et al., 2005; Dong et al., 2004; Edwards et al., 2003; Pirkola et al., 2005; Coker et al., 2011).

Parental and maternal stress are associated with child behavior problems such as attention-deficit hyperactivity disorder and sleep disturbances, alterations in child neuroendocrine-immune function, mood and anxiety disorders (Mash and Johnston, 1990; Lupien et al., 2009; Tosevski and Milovancevic, 2006; Riis et al., 2016) and may impact the healthfulness of the family food environment (Bauer et al., 2012). Stress in early childhood is associated with deficits in cognitive performance, memory, executive functioning and emotion regulation (Pechtel and Pizzagalli, 2011) and it is a risk factor for obesity in children (Wilson and Sato, 2014; De Vriendt et al., 2009; Dockray et al., 2009; Roemmich et al., 2007; van Jaarsveld et al., 2009) and women (Liu and Umberson, 2015).

Some researchers have proposed that a measure of stress could be

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based on events that occur over the life course (DeLongis et al., 1988). Life events have been defined as significant experiences involving a relatively abrupt change that may produce serious and long lasting effects (Olafsson and Svensson, 1986; Settersten and Mayer, 1997) and can be classified as normative and non-normative or major and everyday life events. Normative life events are predictable happenings or transitions that families experience over the life course (e.g. parenthood, marriage, entering kindergarten) (Price et al., 2010). Non-normative life events are relatively unpredictable with potentially destabilizing effects on family functioning (e.g. death of a family member, change in residence) or positive situations that can create a deep imbalance within the family system (e.g. better changes in financial state). Major life events are stressful events that are typically experienced on an irregular basis such as the death of a relative and divorce, whereas everyday life events refer to stressful events experienced in the day-to-day lives of individuals (e.g. increased child care duties, handling finances) (Wagner et al., 1988). Effects of life events on individual and family functioning depend on individual attitudes toward change, on the capacity to adjust, and on the support available (Berge et al., 2012). It could be the accumulation of several stressor events rather than one isolated event that determines a family's level of stress (Holmes and Rahe, 1967; McCubbin et al., 1980; Sarason et al., 1978). The measurement of life events reveals the family's well-being.

Stressful life events and their impact on human life have attracted many researchers in recent years (Sali et al., 2013). Many studies have used the Social Readjustment Rating Scale (SRRS) (Holmes and Rahe, 1967). The Psychiatric Epidemiology Research Interview Life Events Scale (Dohrenwend et al., 1978), the Life Events and Difficulties Schedule (Brown and Harris, 1978) and the Standardized Event Rating System (Dohrenwend et al., 1993) are often used. Stressful experiences on the daily level are assessed with self-report daily diaries such as the Daily Life Experiences Checklist (Stone and Neale, 1982) and the Daily Stress Scale (Bolger and Schilling, 1991). Although the literature reveals that different scales and tools have been developed and used to assess life events, it seems that there is no single life events instrument that is appropriate for all populations or one that is generally accepted in the field (Cohen, Psychosocial Working Group, 2000). Therefore, a specific definitive life events scale with a reasonable and balanced representation of events (Cohen et al., 1995) should be created. Moreover, a psychometrically valid measure of life events could help screen and provide considerable information about family history, family life, caregivers and other family members. This type of measure is important not only for research in health-related fields to evaluate the impact of salient stressors on health outcomes but also for clinical applications in stress prevention.

Our study aims to develop a reliable and valid measurement of stressful life events by utilizing information about stressful family experiences in the past year. Using data from the Synergistic Theory and Research on Obesity and Nutrition Group (STRONG Kids) cohort, the objectives of the study were 1) to gain a preliminary understanding of the underlying structure of a stressful life events measure that was adapted from the Social Readjustment Rating Scale (SRRS) (Holmes and Rahe, 1967), and 2) to assess the reliability and validity of its subscales in determining parents' and children's psychological and physical wellbeing using established measures of social support, stress, depression, anxiety and maternal and child health.

2. Methods

2.1. Participants

Parents (caregivers) and their 2–5-year-old child (n = 497) were recruited as part of the STRONG Kids cohort, a 3-wave study conducted over 5 years that explores childhood obesity within a developmental, ecological framework (Harrison et al., 2011). To ensure socio-economic and racial/ethnic diversity, an unequal probability sampling frame was

used to identify licensed day care centers (n = 33) across five counties in [blinded for review]. Beginning in January 2009, 91% (n = 30) of the centers permitted recruitment of children and their parents. Written informed consent was obtained from the parents and assent was obtained from the children to collect height and weight. Parents completed surveys online or were mailed surveys if they did not have Internet access. Response rates among parents ranged from 60% to 95% across centers. This research was approved by the Institutional Review Board at [Institution blinded for review] and meets all requirements for ethical conduct for research with human subjects.

2.2. Measures

2.2.1. Stressful life events scale

This scale, adapted from the SRRS (Holmes and Rahe, 1967), asks a series of 43 life events including marriage, trouble with boss, death of a close friend, vacation, and change in residence. On the original scale, 394 participants (55% female, 92% White, 46% with less than College education) were asked to rate the 43 life events to reflect the degree of perceived readjustment (time and ability needed to accommodate to change). Marriage was rated as 50 and the participants were asked to assign a number for the remaining items based on whether they needed more or less readjustment than marriage (e.g., 100 or 40, respectively). In the current study, caregivers were asked if they or someone in their immediate family experienced the event the past year. The same life events were used in their original order. The scale was adapted by asking the caregivers to place a check mark next to the experienced event and a check mark if it was stressful. If the event was not experienced it was left blank. The purpose of this adaptation was to simplify the measures and increase its reliability when used in a survey. Moreover, it allowed for the examination of the accumulation of stressors. Life events that were marked as stressful were coded as 1, 0 otherwise and their sum was used to construct the life events total and subscales score.

2.2.2. Scales and items used for validity testing

Three scales (Medical Outcomes Social Support Scale (MOSS), Social Support Scale, and Depression, Anxiety and Stress Scale (DASS-21) and 14 general health items (11 caregiver-specific items, 3 child-specific items) were used for validity analysis.

2.2.3. MOSS

The abbreviated MOSS is a 12-item measure that assesses social support availability if needed (Gjesfjeld et al., 2007). It was derived from a 19-item version that was developed based on responses of 3000 patients with chronic health conditions. It demonstrated acceptable model fit, internal consistency, and concurrent reliability in a sample of 330 mothers whose children were in treatment. Item responses range from 1 (none of the time) to 5 (all of the time), with higher scores indicating greater social support availability. It consists of 4 subscales: tangible (3 items, e.g. "Someone to take you to the doctor if you needed it"), affectionate (3 items, e.g. "Someone who shows you love and affection"), positive social interaction (3 items, e.g. "Someone to do something enjoyable with") and emotional-informational (3 items, e.g. "Someone to give you good advice about a crisis"). The MOSS measure was selected for inclusion in the study because of the proposed inverse correlation between life events that are considered stressful and perceived support. Relevant items within each subscale were summed. Higher scores indicate more availability of social support. In this sample, mean (standard deviation), minimum, maximum and Cronbach's alpha were 50.6 (10.2), 12, 60 and 0.951 for the total score; 12.0 (3.4), 3, 15 and 0.942 for tangible; 13.4 (2.5), 3, 15 and 0.921 for affectionate; 12.9 (2.8), 3, 15 and 0.934 for positive social interaction; 12.1 (3.2), 3, 15 and 0.945 for emotional-informational scores, respectively.