Original article

Exposure to stress across the life course and its association with anxiety and depressive symptoms: Results from the Australian Women's Wellness After Cancer Program (WWACP)

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Abstract

Objectives: Exposure to life stressors can negatively influence health and quality of survivorship in women after cancer though our understanding of the underlying mechanisms is limited. In this study, we tested alternate life course models to determine which best described associations between exposure to stressors in childhood, adolescence, and adulthood, and self-reported health in women previously treated for breast, gynaecological, and haematological cancer.

Study design: Data were drawn from 351 Australian women within 2 years of completing active cancer treatment who were participating in the Women's Wellness After Cancer Program (WWACP) randomised-controlled trial. A model building framework compared "accumulative risk" and "critical period" stress exposure hypotheses with the saturated model to determine best fit.

Main outcome measures: Symptoms of anxiety and depression were measured using the Center for Epidemiologic Studies Depression Scale (CES-D) and Zung Self-rating Anxiety Scale (SAS).

Results: Women with greatest number of stressful life events (SLEs), also reported more sleep disturbance, anxiety and depressive symptoms ($p < 0.01$ for all). After adjustment for possible confounders however, exposure to SLEs was associated with anxiety (SAS) but not depressive symptoms (CES-D). Alternate life course models for anxiety and stress were compared with the saturated model (i.e., the accumulative risk) but none showed a significantly improved fit.

Conclusions: Findings showed that anxiety was increased in women with an accumulated life stressors and highlights the need for whole-of-life supportive care approaches for women previously treated cancer.

Keywords: Stress; Anxiety; Depressive symptoms; Life course; Cancer survivors; Women.

1. Introduction

Stress occurs as a physical and emotional response to a perceived threat or hazard [1]. While some stress might be perceived as normal and can increase motivation, alertness and provide energy to meet challenging situations, stressors that result in feelings of helplessness and fear can negatively affect health and wellbeing [2, 3]. Indeed, research suggests that chronic stress can alter neural, cardiovascular, autonomic, immune and metabolic system functioning, potentially leading to dysregulation, changes in lifestyle behaviors, and increased risk of ongoing health problems [4].

Among female cancer survivors, there is a growing body of evidence to suggest that stressful life events (SLEs) increases risk of poor psychological adaptation to cancer diagnosis [5], altered health seeking behaviour, delayed cancer treatment, and worse functional health and wellbeing [6]. More generally, exposure to adverse life experiences have been linked with psychosocial stress with the development of anxiety and depression [7-9], as well as physical health complaints like increased adiposity [10], adverse menopausal transition [11], and a number of chronic conditions like diabetes and cardiovascular disease [4, 12, 13].

It is also likely that the negative effects of stress are associated with the number of stressful events [2, 3, 8, 13] and, the presence of other comorbid health conditions [13]. In cancer patients specifically, exposure to SLEs has been associated with lower cancer survival [14, 15]. According to Chida and colleagues, previous (distal) and current (proximal) stress-related psychosocial factors might also have a slow but cumulative impact on cancer survival and mortality by possibly mediating post-treatment health behaviour and increasing depressive symptoms [14].

There is also compelling evidence to suggest that exposure to stress after treatment can adversely affect health, although the extent to which stress contributes to poor health outcomes, its potential mechanisms, and the reciprocal nature of stress and poor health, are often difficult

to determine because of methodological, operational, and population differences across existing studies [1, 14].

This study will address some of these issues. This paper utilizes a life course approach to examine the potential health trajectories of women following exposure to stressful life events. We propose that the *cumulative impact* of stress may pose a heightened risk to long term health, [16] and exposure to stress at different stages in life might provide insight into the potential pathways for disease etiology. If exposure to stress is associated with distinct health trajectories, substantive preventative women's health policy and practice guidelines can be developed, thus avoiding future chronic and costly health problems.

2. Methods

2.1. Participants and Procedure

This paper presents baseline data from 351 women aged 18 years and older, within 2 years of completing active treatment for breast, gynaecological or haematological cancer, participating in a 12-week digitised multimodal lifestyle intervention (Women's Wellness After Cancer Program or WWACP). The protocol for this intervention has been detailed elsewhere (REF).

Women after cancer were recruited through hospitals (Princess Alexandra Hospital, Royal Brisbane and Women's Hospital, St John of God Murdoch Hospital, Peter MacCallum Cancer Institute, and the Choices Cancer Support Program) and consumer groups (the National Breast Cancer Foundations' Register⁴ and the Breast Cancer Network of Australia) throughout Australia and ethical approval was sought from relevant Human Research and Ethics Committees (QUT Approval number: 1300000048) prior to participant recruitment.

2.2. Measurements

Data were collected in two ways: (1) an electronic structured questionnaire was used to collect quantitative data on socio-demographic characteristics, modifiable lifestyle factors, stressful life events, and health and wellness, and; (2) virtual face-to-face consultations were used to collect data on past medical and surgical history, dietary intake, physical activity, alcohol consumption, and anthropometric measures.

2.3. Outcome variables

Symptoms of anxiety and depression were measured using two well-validated instruments; the Center for Epidemiologic Studies Depression Scale (CES-D)[17] and Zung Self-rating Anxiety Scale (SAS)[18].

The CES-D is a widely used 20-item measurement which primarily measures recent depressed mood or affect [19] with demonstrated sound psychometric properties in both general [20] and clinical populations [21, 22]. The CES-D scores range from 0 – 60, with higher scores indicating more depressive symptoms (score of between 16 and 26 suggesting mild depression and scores of 27 or more suggesting major depression) [20, 23-25].

The SAS is a 20-item self-reported instrument that measures four domains consistent with common symptoms of anxiety, i.e., cognitive, autonomic, motor and central nervous system [18]. The SAS has been widely used in both non-psychiatric and psychiatric samples and has demonstrated good item-total correlations and test–retest reliability [26-28]. Scores for this instrument range from 20-80 with higher score reflecting higher levels of anxiety (scores of 45-59 are consistent with mild to moderate anxiety, 60-74 with marked to severe anxiety, and 75-80 consistent with extreme anxiety).

2.4. Primary predictive variable

Past exposure to SLEs were assessed using the List of Threatening Experiences (LTE) questionnaire [29]. The LTE is a 12-item instrument that has been widely used to assess recent exposure to stressful events (in the past 6 months) and their correlation with

psychosocial and emotional factors [30]. To enable exploration of exposure to life stressors across the life course, additional items were constructed from the LTE questionnaire. These items assess identical events but over a longer timeframe, for example, participants were asked about life events or problems that had occurred more than 6 months ago, and if affirmative, the age at which the event had occurred. Internal consistency of the modified LTE instrument (LTE-mod) was computed using the Cronbach's alpha and was within acceptable limits [31], Cronbach's $\alpha = 0.60$. For this analysis, life stressors were grouped in two ways: (1) the lifetime total number of stressful events were calculated and grouped into an ordinal variable indicating no stressors, 1-2 SLEs, and 3 or more SLEs, and; (2) LTEs were dichotomized (no/yes) according to the timing at which the events occurred, i.e., aged 0-2 years, aged 3-17 years, aged 18-39 years, and 40 years and older.

2.5. *Covariates*

Several covariates were considered in this analysis. Two socio-demographic variables were included, age (continuous variable) and highest educational attainment (year 10 or less/year 12 technical certificate or diploma/university or college degree), both of which were collected using standard instruments. Two modifiable lifestyle factors were also included. Sleep disturbance was measured using the Pittsburgh Sleep Quality Index (PSQI), a 19-item self-report instrument with well-established reliability and validity and has demonstrated utility in both clinical and research settings[32]. The second lifestyle factor was body mass index (BMI) which was calculated from self-reported weight and height according to the WHO International Classification of adult weight [33]. The final covariates were previous diagnosis with anxiety or depression (yes/no).

2.6. *Statistical analyses*

All data were analysed using the SPSS (Statistical Package for the Social Sciences) Version 23 [34] or STATA 13 [35] statistical packages. Descriptive statistics are expressed as

counts and percentages, and mean (SD), while bivariate associations were analysed using χ^2 tests, Pearson's correlation coefficients, analysis of variance (ANOVA), or their non-parametric equivalent. The level for significance was set at $\alpha = .05$.

The multivariable analyses were undertaken in two parts. First, multiple linear regression analyses were performed to assess the impact of stressful life events (ordinal variable), socio-demographic characteristics (education, age), lifestyle factors (BMI, sleep), and past medical history (anxiety/depression) on symptoms of anxiety and depression. Variables were entered using a stepwise approach to determine their relative impact on the chosen outcomes. This approach was also used to evaluate data before proceeding with further analysis.

Based on the results from the previous regression analysis, Mishra's [36] model-building technique was used to examine a series of hypotheses consistent with a life course approach. The outcome variables (Y_1, Y_2), anxiety (SAS) and depressive symptoms (CES-D), were normally distributed continuous variables and the binary explanatory variable, exposure to life stressors (S_j), were assessed at time points t_1, t_2, t_3, t_4 , which corresponded to ages 0-2, 3-17, 18-19, 40 years or more.

A series of life course models corresponding with the accumulation, sensitive, proximal, and distal hypotheses were developed to allow 8 possible stress trajectories. The saturated model for each outcome included 4 main effects, 3 two-way interactions ($t_1 \times t_2, t_2 \times t_3, t_3 \times t_4$), 2 three-way interactions ($t_1 \times t_2 \times t_3, t_2 \times t_3 \times t_4$), and 1 four-way interaction ($t_1 \times t_2 \times t_3 \times t_4$). The hypothesized models and their specifications are further outlined in Table 1.

[Insert table 1 about here]

Model fit was assessed by compared a series of nested models that corresponded with the hypothesized models (sensitive period, distal, proximal models) with the saturated model (which is consistent with the accumulation hypothesis) outlined in equation 1.

$$E(Y) = \alpha + \beta_1 S_1 + \beta_2 S_2 + \beta_3 S_3 + \beta_4 S_4 + \Theta_{12} + \Theta_{23} + \Theta_{34} + \Theta_{123} + \Theta_{234} + \Theta_{1234} \quad (1)$$

Two criteria were used to calculate model fit: (1) a likelihood ratio chi-square test (LR test) which compares the log-likelihood for a more restrictive model (models 1-7) and the log-likelihood for the less restrictive model (model 8), and statistical significance suggests the less restrictive model is a significantly better fit than the alternate models, and; (2) the Bayesian Information Criterion (BIC) whereby best fit was determined by the smallest criteria value.

3. Results

3.1. Sample description

Sample characteristics by SLEs are presented in Table 2. No significant correlations between life stressors and socio-demographic factors were noted. The average age of women in the sample was 53 years ($SD = 8.8$), over two-thirds (69.7%) were Australian born and 76.9% of women were married or living in a de facto relationship. In terms of lifestyle factors, only 11.5% of women exercised 5 or more times per week and many were overweight or obese (BMI: $M = 27.7$, $SD = 6.0$).

[Insert table 2 about here]

3.2. Bivariate correlations

Positive linear correlations were noted between number of stressful life events and sleep disturbance (PSQI: $F(2,343) = 9.454$, $p < 0.01$), anxiety (SAS: $F(2,345) = 7.175$, $p < 0.01$), and depressive symptoms (CES-D: $F(2,345) = 5.090$, $p < 0.01$).

Table 3 shows the bivariate analysis of socio-demographic characteristics, lifestyle factors, and health indicators with anxiety and depressive symptoms. Anxiety was negatively correlated with age ($r = -0.127$, $p = 0.02$) and positively correlated with sleep disturbance ($r = 0.389$, $p < 0.01$) and body mass ($r = 0.127$, $p = 0.02$). Levels of anxiety were higher among

women who completed high school only compared with a university degree ($F(3,342) = 2.973, p = 0.03$) and also higher among women who reported past diagnosis with anxiety ($t(279) = -3.560, p = 0.05$) or depression ($t(279) = -3.560, p < 0.01$). Similar trends were noted for depressive symptoms (see Table 3).

[Insert table 3 about here]

3.2. Linear models

The results of linear regression models for anxiety (SAS) and depression (CES-D) are shown in Tables 4 and 5 respectively. Models adjusted for life stressors, sociodemographic variables (age, education), health indicators (past diagnosis with anxiety/depression), and modifiable lifestyle factors (sleep disturbance and body mass) using a stepwise approach. Positive linear correlations were noted between past life stressors and anxiety levels, though the significance of this relationship was reduced following adjustment for sleep disturbance (1-2 life stressors: $B = 1.72, 95\% CI 0.11 - 3.34, p = 0.04$; 3 or more life stressors: $B = 2.98, 95\% CI 0.09 - 5.87, p = 0.04$). The final model (Model 4) accounted for 22.7% of the variance in anxiety and was positive correlated with sleep disturbance ($B = 0.68, 95\% CI 0.45 - 0.92, p < 0.01$) and self-reported history of depression ($B = 2.35, 95\% CI 0.60 - 4.10, p = 0.01$) and negatively correlated with age ($B = -0.12, 95\% CI -0.20 - -0.03, p < 0.01$) and educational attainment (Technical/trade certificate or diploma: $B = -3.78, 95\% CI -6.73 - -0.84, p = 0.01$; university degree: $B = -4.00, 95\% CI -6.72 - -1.29, p < 0.01$).

With regard to depressive symptoms, life stressors, sociodemographic characteristics, past anxiety and depression, and modifiable lifestyle factors explained less than one-quarter of the total variable ($R^2 = 0.185$) and yielded few significant correlations. Indeed, only age ($p = 0.02$), past history of depression ($p < 0.01$), and sleep disturbance ($p < 0.01$) retained significance in the final model (see Table 5). Notably, whilst past exposure 1-2 life stressors was positively correlated with depressive symptoms in earlier models (models 1-3), exposure

to 3 or more stressors was not a significant predictor. Moreover, following adjustment for sleep disturbance, past life stressors were no longer significant (1-2 stressors: $B = 1.98$, 95% $CI -0.21 - 4.18$, $p = 0.08$; 3 or more stressors: $B = 1.32$, 95% $CI 2.60 - 5.25$, $p = 0.51$). On the basis of this analysis, additional modelling of depressive symptoms was not performed and only Zung's Self-rating Anxiety Scale (SAS) were used to test hypotheses consistent with a life course approach.

[Insert tables 4 and 5 about here]

3.4. Life course models

The results of the life course models adjusted for age, education, history of depression, and sleep disturbance (PSQI) and fit statistics are presented in Table 6. Trajectories that suggested exposure to life stressors in earlier life yielded the higher levels of current anxiety compared with women who only experienced stressors in adulthood. Alternative regression models that corresponded to the hypotheses outlined in Table 1 were fitted to the data. The accumulation of stress exposure across time points provided the best fit for the data as none of the nested models (models 1-7) showed significant improvements in model fit (all $LR \chi^2 \geq 0.05$). For women with accumulated stressors, they reported an average 4.7 units higher in self-reported anxiety scores compared to those without past exposure to SLEs ($M = 34.67$, 95% $CI 32.99 - 36.34$ vs. $M = 39.39$, 95% $CI 33.77 - 45.01$ respectively).

[Insert table 6 about here]

4. Discussion

The potentially deleterious impact of exposure to life stressors is increasingly recognized as a significant public health issue. Evidence suggests that chronic psychosocial stress is associated with the development of anxiety and depression [7-9] and might even predict future morbidity and mortality [13]. This study explored associations between

exposure to stressors throughout the life course and self-reported health in women after treatment for cancer. We found that for women in this study, anxiety (but not depressive symptoms) was significantly correlated with past life stressors following mutual adjustment for socio-demographic characteristics, lifestyle factors and health indicators.

Our findings also showed positive linear correlations between number of stressful life events and anxiety scores. For women after cancer, elevated anxiety levels and depressed mood are common in the year following cancer diagnosis [37, 38] though these symptoms generally abate thereafter [39, 40]. Notably however, is a small cohort of women for whom psychological symptoms persist and who are thus, at increased risk of poor quality of survivorship [41, 42]. Possibly, adjustment after cancer diagnosis is likely to be associated with pre-cancer experiences like past life stressors. Biomedical research suggests that repeated “hits” from multiple stressors contribute to persistent hyperarousal that can last beyond the duration of stress exposure [43, 44]. Taken together, these results raise the possibility that exposure to multiple or recurrent stressors can inhibit homeostasis potentiating wear and tear on bodily systems and increasing risk of adverse health outcomes [4, 43].

One notable way in which this study differs from previous work was in relation to life stressors and depressive symptoms. This is in stark contrast with previous studies that have linked SLEs with risk of later depressive disorders [45]. One explanation might be in relation to possible interaction effects; Juster and colleagues highlights the multiple mechanisms by which interdependent factors (like socio-demographic characteristics, lifestyle, social support mechanisms, and genetics) can contribute to allostatic load [43]. Indeed, for women in this study, sleep was significantly correlated with SLEs and depressive symptoms, and as both stress and sleep disturbance contribute to depressed mood, this might be one of the mechanisms by which stress effects health. It should be noted however, that despite the likely

reciprocal interactions between stress, sleep, and depression [46], the cross-sectional nature of this data limits determination of the temporal ordering of variables and further research is needed.

Life course models explored the timing of SLEs across the life span and suggested that those who exposed to distal stressors and who reported accumulated stress exposures across time points yielded the higher levels of current anxiety compared with women who did not experience SLEs or experienced stressors only in adulthood. There is compelling evidence highlighting the importance of early life experiences on both stress reactivity and the development of positive coping strategies. Early adversities often yield life-long behavioural and pathophysiological problems [4, 16, 45, 47]. Moreover, in animal studies early stressors mediated responsiveness to persistent or repeated stressors later in life thereby potentiating risk of anxiety and mood disorders [44, 48]. The results highlight the importance of broader social context in the health and wellbeing of women after cancer [39] and emphasises the need for a whole-of-life approach for supportive care in cancer survivorship.

Several study limitations should be noted. First, the analysis presented in this paper is based on baseline data from women participating in a lifestyle intervention and thus self-selection might have influenced the representativeness of the sample. Moreover, by virtue of the type of intervention and the requirements for an Apple device, might have reduced participation by those who were poorer, reported worse health, and for whom English proficiency was limited. Indeed, there is evidence to suggest that women in this study reported higher educational attainment and income than population-based normative data for Australian women aged 18-64 [49].

Second, a priori power analysis suggested a total sample size of 536 women but initial calculation was revised due to logistical and recruitment issues. The resulting sample ($n = 351$) was smaller than anticipated and therefore the study might have been underpowered.

These research methods should be replicated in larger samples to better explore trajectories and to examine more specific age ranges.

Finally, current data did not find correlations between exposure to life stressors across the lifespan and depressive symptoms. Individual variability in depressive symptoms are possibly influenced by complex interactions between multiple risk and protective factors and further exploration of the potential mediation/moderation pathways associated with cognitive appraisal of life stress (i.e., perceived stress) is warranted.

Despite these limitations, this is one of the first studies to use a model building framework to examine life course approaches to stress exposure in this population. While research suggests that greater adversity (i.e., number of SLEs) was linked with higher anxiety and more sleep disturbance the timing of stressors might also be an important factor and highlight the importance of considering the cancer experience within the broader social context. Future research should consider health trajectories following exposure to stressful life events in specific age ranges.

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Table 1

Model testing of potential trajectories following exposure to stress across the lifecourse

Model	Timing of stressor				Hypothesis	Equation for $E(Y)$
	t_1	t_2	t_3	t_4		
Model 1	-	-	-	-	No stressors	α
Model 2	✓	-	-	-	Early sensitive period	$\alpha + \beta_1 S_1$
Model 3		✓	-	-	Adolescent sensitive period	$\alpha + \beta_2 S_2$
Model 4	-	-	✓		Early-adulthood sensitive period	$\alpha + \beta_3 S_3$
Model 5	-	-	-	✓	Midlife sensitive period	$\alpha + \beta_4 S_4$
Model 6	✓	✓	-	-	Distal stressors*	$\alpha + \beta_1 S_1 + \beta_2 S_2 + \Theta_{12}$
Model 7	-	-	✓	✓	Proximal stressors†	$\alpha + \beta_3 S_3 + \beta_4 S_4 + \Theta_{34}$
Model 8	✓	✓	✓	✓	Accumulation	$\alpha + \beta_1 S_1 + \beta_2 S_2 + \beta_3 S_3 + \beta_4 S_4 + \Theta_{1234}$

t_1 , time 1 denotes exposure to stressor/s aged 0-8 years (early childhood); t_2 , time 2 denotes exposure to stressor/s aged 9-17 years (later childhood/adolescence); t_3 , time 3 denotes exposure to stressor/s aged 18-39 years (early adulthood); t_4 , time 4 denotes exposure to stressor/s aged 40 years or older (midlife and older).

$S_j = 1$ if exposure to stressor at specific time of life; $S_j = 0$ if no stress exposure at specific time of life; α is the expected value of Y when S_1, S_2, S_3, S_4 all equal 0.

* Distal stressors are those that occurred earlier in life (aged 0-17 years or $Y_{11^{**}}$)

† Proximal stressors are those that occurred more recently (at 18 years or older or Y_{**11})

Table 2

*Participant characteristics (n = 351)**

Variables	Total n (%) or M (SD)
Socio-demographic characteristics	
Mean age (SD)	53.2 (8.8)
Country of birth n (%)	
Australia	242 (69.7)
Elsewhere	105 (30.3)
Marital status n (%)	
Married or de facto relationship	266 (76.9)
Separated or divorced	39 (11.3)
Widowed	9 (2.6)
Single	32 (9.2)
Employment n (%)	
Employed (full/part time)	277 (79.6)
Home duties	26 (7.5)
Retired	33 (9.5)
Other	12 (3.4)
Highest educational attainment n (%)	
Year 10 or less	31 (9.0)
Year 12	37 (10.7)
Technical/trade certificate or diploma	79 (22.8)
University degree	199 (57.5)
Health indicators	
Time from cancer diagnosis n (%)	
Less than 6 months	28 (10.0)
6-12 months	87 (31.1)
12.1-24 months	104 (37.1)
More than 24 months	61 (21.8)
Mean anxiety score (SD)†	42.73 (8.1)
Mean depressive symptoms score (SD)‡	12.8 (8.6)
History of anxiety n (%)	
No	222 (79.0)
Yes	59 (21.0)
History of depression n (%)	
No	210 (74.7)
Yes	71 (25.3)

* n's might differ because of missing values

† Anxiety measured using the Zung Self-Rating Anxiety Scale (SAS)

‡ Depressive symptoms measured using the Center for Epidemiological Studies-Depression (CES-D)

Table 3

Testing alternate models of depressive symptoms associated with stress exposures

Models	Center for Epidemiological Studies - Depression (CES-D)	Model fit statistics [†]			
	Mean (95% CI)	Log likelihood (ll)	df	LR χ^2	p
Model 1 (No stressors)					
Y_{0000}	11.15 (9.10, 13.20)	-1240.23	14	-	-
Models 2-5 (Sensitive periods)					
Y_{I***}	14.61 (12.31, 17.08)	-1239.01	12	18.09	0.113
Y_{*I**}	12.74 (10.73, 14.76)	-1240.23	12	20.53	0.058
Y_{**I*}	12.84 (11.54, 14.14)	-1240.23	12	20.51	0.058
Y_{***I}	12.65 (11.17, 14.13)	-1240.21	12	20.48	0.058
Model 6 (Distal stressors)					
Y_{II**}	15.00 (8.63, 21.38)	-1239.01	10	18.07	0.054
Model 7 (Proximal stressors)					
Y_{**II}	12.27 (10.76, 13.77)	-1238.03	10	16.13	0.096
Model 8 (Accumulation)					
Y_{IIII}	16.20 (8.75, 23.64)	-1229.97	-	-	-

[†]All models compared the saturated model with a more restrictive alternative (i.e., Models 1-7)

df, degrees of freedom; LR, Likelihood Ratio.

Table 4

Testing alternate models of anxiety associated with stress exposures

Models	Zung Self-Rating Anxiety Scale (SAS)	Model fit statistics [†]			
	Mean (95% CI)	Log likelihood (ll)	df	LR χ^2	p
Model 1 (No stressors)					
Y_{0000}	42.86 (40.96, 44.76)	-1231.29	14	-	-
Models 2-5 (Sensitive periods)					
Y_{I***}	45.42 (43.09, 47.75)	-1228.32	12	18.08	0.113
Y_{*I**}	43.69 (41.79, 45.59)	-1230.67	12	22.78	0.030
Y_{**I*}	42.25 (41.02, 43.47)	-1230.71	12	22.84	0.029
Y_{***I}	42.40 (41.32, 43.47)	-1230.79	12	23.01	0.028
Model 6 (Distal stressors)					
Y_{II**}	46.25 (40.27, 52.22)	-1227.56	10	16.54	0.085
Model 7 (Proximal stressors)					
Y_{**II}	41.93 (40.50, 43.36)	-1230.30	10	22.04	0.015
Model 8 (Accumulation)					
Y_{IIII}	46.75 (39.74, 53.76)	-1219.28	-	-	-

[†]All models compared the saturated model with a more restrictive alternative (i.e., Models 1-7)

df, degrees of freedom; LR, Likelihood Ratio.