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Adverse life events and health: A population study in Hong Kong

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ABSTRACT

Objective: Although the effects of adverse life events on mental health have been well documented in the literature, there has never been a population based study that investigated systematically the association between history of adverse life events and physical health (objective and subjective) in adults.

Method: Cross-sectional, face-to-face household population based survey of adults (18+) in Hong Kong ($N = 1147$). Participants were asked if they had a diagnosis of six health conditions including hypertension, heart disease, arthritis, diabetes, eyesight degeneration, and hearing loss. They were also asked if they had experienced five adverse life events including death of a partner or spouse, abuse, natural disaster, life threatening illness or injury, and family disruption. Interviews also included the Short-Form 12 Health Survey (SFHS-12) and the short version of the Centre for Epidemiologic Studies Depression Scale (CES-D).

Results: Overall, results indicate that specific adverse life events may be associated with specific health conditions. However, all tested life events were associated with subjective physical and mental health. Death of partner or parent and life threatening illness or injury were found to have the strongest association with physical health problems. A dose–response relationship between adverse life events and physical health in general was evident but more so for heart disease and eyesight degeneration.

Conclusion: Considering the high prevalence of traumatic events and how common the conditions associated with such events are in the general population, screening for adverse life events as part of comprehensive assessment will allow a deeper understanding of patients' needs.

Introduction

Adverse life events such as violence, accidents and disasters are very common in the general population with the majority of adults (60.7% of men and 51.2% of women) reporting having experienced at least one event in their lifetime [1]. The impact of such events on health and well-being has been well documented in previous literature [1,2]. Evidence from both animal and human studies suggest that the stress associated with exposure to traumatic events can cause dysregulation in a number of systems including neuroendocrine [3], immune [4], metabolic [5] and cardiovascular systems [6]. The exact mechanisms on how such dysregulation may occur remains unknown, although there is evidence to suggest that exposure to adverse life events can affect a number of physiological regulatory systems such as the hypothalamic–pituitary–adrenal (HPA) and autonomic nervous system [7] that can predispose to poor physical health. The effects of adverse life events on physical health can be present even in the absence of mental health effects,

although can be mediated by health behaviours such as smoking and alcohol use [8,9] or presence of psychopathology such as depression [10].

Despite the documented effects of adverse life events on health and well-being, there have been few population based studies that investigated systematically the association between history of adverse life events and physical health conditions in adults, for example the Detroit Neighbourhood Health Study [11] where it was found that people with the highest levels of adverse events exposure (8+ events) had an average age of adverse physical health condition diagnosis that was 15 years earlier than respondents with no exposure. In another cross-sectional study in 14 countries, a dose–response association between increasing number of life events and onset of physical conditions was found, independent of all mental disorders [12]. Associations did not vary greatly by type of life event nor across countries. Finally, in the Wave 2 study of the National Epidemiologic Survey on Alcohol and Related Conditions in the US [13], it was found that injurious and witnessing trauma were significantly associated with all the assessed physical conditions including cardiovascular, gastrointestinal diseases, diabetes, and arthritis. A dose–response relationship between number of traumatic events and physical conditions was demonstrated in support of previous research in the area [11,12].

To date, there has been no population based study investigating the above associations in a sample from Asia. To add to the above evidence,

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we set out to investigate the association between number and type of life events with physical health problems as well as subjective wellbeing (physical and mental) in a representative sample from the population in Hong Kong. Results from Western countries cannot be generalised to Asian populations because of the differences in physical and mental health trends between Western and Asian countries. Indeed, there is evidence to suggest that somatization is highly prevalent in Asian samples and may account for lower levels of mental health disorders in these populations [14]. No previous study has also investigated the association between exposure to life events and objective and subjective health and wellbeing in a single study. Based on findings from previous research [11–13], we hypothesised that patterns of associations of certain types and number of life events will differ in respect to their relationship with physical health problems and subjective wellbeing.

Methods

Participants

Data were obtained from a household survey carried out in Hong Kong between August and December 2012. The survey included all household members, aged 18 or above, who were of Chinese ethnicity, permanently residing in Hong Kong, able to communicate, and who consented to participate. A sample list from the Hong Kong Census & Statistics Department based on the frame of quarters maintained by the Census and Statistics Department was obtained. This is the most up-to-date, complete and authoritative sampling frame available in Hong Kong. A two-stage stratified sample design was adopted, with the records in the frame of quarters first stratified by geographical area and type of quarters. For the second stage, all the household members aged 18 or above in each household were invited to participate in an interview. A total of 2300 living quarters (LQs) were randomly sampled from the frame of quarters, among which 2019 of the quarters had eligible participants. Of those, a total of 297 (14.7%) quarters refused to be interviewed, and another 483 (23.9%) were not contactable. A total of 1239 quarters (with eligible respondents aged 18 or above) were successfully enumerated, representing a response rate of 61.4%. A total of 1147 eligible participants from these quarters were successfully interviewed. Accordingly, the precision of the estimates is expected to be within the range of plus/minus 2.3 percentage points at 95% confidence, assuming simple random sampling. Prior approval for the study was obtained from the ethics committee of Hong Kong University. Data collection took place in the participants' homes. A research assistant explained the study to each participant and obtained their informed consent. Interviews were based on the following measures:

Measures

Demographics including age, gender, marital status, education, employment, and dependents (i.e. children and older adults).

Lifetime history of adverse life events
Participants were asked if they had experienced a number of adverse life events including death (parent or spouse), abuse (physical abuse by spouse, physical abuse by parent, sexual abuse, witnessed abuse), natural disaster, life threatening illness or life threatening injury, and Family Disruption (Divorce or Parent Worked Away).

Physical health
Participants were asked if they had a diagnosis of a number of conditions including hypertension, heart disease, arthritis, diabetes, eyesight degeneration, and hearing loss. The classification of physical health problems was based on the Charlson Comorbidity Index [15]. Diagnoses of cancer or an ulcer were also assessed but were not included in the analysis due to lack of variance. Further variables indicating the number

of diagnoses per participant and presence of any physical health condition were created from these data.

Subjective well-being
The Short-Form 12 Health Survey [16] was used for the assessment of subjective health. This 12-item measure was adapted from the original SF-36 health survey. A standard scoring algorithm has been developed in the Hong Kong Chinese population to aggregate the item scores to indicate the overall physical health (i.e., physical component score, PCS) and overall mental health (i.e., mental component score, MCS). Both PCS and MCS ranged from 0 to 100, with a higher score indicating better health status. The cut-off score for both PCS and MCS scores is 50.

Depression
The shorter version of the Centre for Epidemiologic Studies Depression Scale [17] was used for the assessment of depression. CES-D consists of 10 items which primarily focus on assessing affective symptoms. The response set is a 4-point Likert scale with a higher score indicating a higher level of depression. A cut-off score of ≥ 12 is indicative of clinical depression.

Statistical analysis

Means (SDs) were calculated for all continuous variables and frequencies (%) for all categorical variables. The association between physical health problems and adverse life events was investigated univariately and multivariately. At univariate level, associations between type and number of adverse life events and type of physical health problems including hypertension, heart disease, osteoarthritis, diabetes, eyesight degeneration, hearing loss, and SFHS-12 were investigated my means of X^2 and t-tests. At multivariate level, factors associated with the presence of health problems were investigated using logistic regression analyses with type of physical health and number of conditions as the dependent variables, and demographics (gender, age, marital status, educational level, employment status, and dependants), number of traumatic events, and CES-D scores as independent variables. Selection of predictors was based on previous population based studies that explored the association between life events and physical health [11–13]. For example, age was found to moderate the association between life events and physical health in one study [12] and depression in another study [11]. With the exception of CES-D, all predictor variables were dichotomous. Linear regression analysis was used to investigate the association between subjective well being as measured by the SFHS-12 subscales and demographics (gender, age, marital status, educational level, employment status, and dependants), number of traumatic events, and CES-D. The same regression model was tested for actual and subjective well-being to allow for comparisons between the two. Variables were checked for normality and multicollinearity. Due to the high number of variables entered into the regression models increasing the risk of a Type I error, a Bonferroni corrected p-value of .0056 was used to determine significance. A standard p-value threshold of .05 was retained for the Chi Squared and t-test analyses.

Results

Table 1 describes demographic characteristics of the sample. Mean age was 53.2 years. A proportion of 52% were females. The majority were married (61.4%), unemployed, homemakers, or retired (53.6%) and had basic education (87.3%). A proportion of 15.3% had children under 18 years of age at home and 14% were supporting elders at home.

The majority ($N = 737$, 64.3%) reported history of at least one adverse life event. As shown in Table 2, the most commonly reported life event was death of a partner or a parent ($N = 612$, 53.4%).

The majority reported no physical health condition ($N = 778$, 67.8%). A proportion of 17.1% reported one condition and a percentage of 15.1% reported more than one physical condition. As shown in Table 3, the most commonly reported condition was hypertension