**Title**

Adverse Life Events and Health: A Population Study in Hong Kong

**Abbreviated Title**

Life Events & Physical Health

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**Title**

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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=1,147). 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.

**Keywords:** adverse life events, physical health, well being

**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, 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 well-being.

**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 2,300 living quarters (LQs) were randomly sampled from the frame of quarters, among which 2,019 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 1,239 quarters (with eligible respondents aged 18 or above) were successfully enumerated, representing a response rate of 61.4%. A total of 1,147 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 X2 and t-tests. At multivariate level, factors associated with 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.

Table 1 about here

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%).

Table 2 about here

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 (N=268, 23.4%). SFHS-12 PCS mean score was 47.5 (Sd=9.5) and MCS was 52.7 (Sd=8.8). CES-D mean score was 0.6 (Sd=0.5).

Table 3 about here

As shown in table 4, univariate analysis revealed that death of a partner or parent was significantly associated with hypertension, heart disease, osteoarthritis, eye sight degeneration, and hearing loss. History of life threatening illness or injury was found to be significantly associated with hypertension, heart disease, eyesight degeneration. History of abuse was found to be significantly associated with eyesight degeneration. Experience of natural disaster and family disruption were not found to be significantly associated with any of the tested health conditions. Experience of any life event was found to be significantly associated with hypertension, heart disease, osteoarthritis, diabetes and hearing loss.

Table 4 about here

All individual adverse life events were significantly associated with SFH-12 PCS including death of a parent or partner (t = -156.8, p = .001), abuse (t = -160.5, p = .001), natural disaster (t = -160.6, p = .001), life threatening illness or injury (t = -160.2, p = .001), family disruption (t = -160.5, p = .001) and experience of any traumatic event (t = -157.0, p = .001). Those who had experienced any of the adverse life events presented, on average, with the lowest SFH-12 PCS score. All individual adverse life events were also significantly associated with SFH-12 MCS including death of a parent or partner (t = -193.2, p = .001), abuse (t = -192.9, p = .001), natural disaster (t = -193.8, p = .001), life threatening illness or injury (t = -193.7, p = .001), family disruption (t = -193.1, p = .001) and experience of any traumatic event (t = -192, p = .001). Those who had experienced any of the adverse life events presented with, on average, the lowest SFH-12 MCS score.

As shown in table 5, logistic regression analyses revealed that history of a higher number of adverse life events is significantly associated with the presence of heart disease, eyesight degeneration and presence of any health condition. Being female was found to be significantly associated with osteoarthritis and eyesight degeneration. Older age was found to be associated with the presence of hypertension, heart disease, osteoarthritis, diabetes, eyesight degeneration, hearing loss, and presence of any condition. Being married was only found to be associated with the presence of heart disease and being employed was found to be significantly associated with the presence of hypertension. Being a carer for the elderly was found to be significantly associated with the presence of hypertension, eyesight degeneration and presence of any condition. Depression levels, educational status and child care were not found to be associated with any of the physical health conditions. All regression models were statistically significant and as shown by the Negelkerke R2, the model explained 42.5% of presence of hypertension, 22.3% of heart disease, 24% of osteoarthritis, 23.3% of diabetes, 33.6% of eyesight degeneration, 28.1% of eyesight degeneration and 51.7% of presence of any health condition variance.

Table 5 about here

As shown in table 6, number of life events experienced was also found to be significantly associated with the SFS-12 PCS score but not SFS-12 MCS score. Age was a significant predictor of both SFS-12 PCS and SFS-12 MCS. Depression score was also found to be associated with SFS-12 PCS and MCS scores. Gender, educational level and being a carer for children or the elderly were not found to be significantly associated with SFS-12 PCS or the SFS-12 MCS scores. Both regression models were statistically significant. The model explained 31.7% of the SFS-12 PCS variance and 35.9% of the SFS-12 MCS variance.

Table 6 about here

Overall, results indicate that specific adverse life events may be associated with specific health conditions. However, not all adverse life events tested in this study were found to be associated with physical health. All tested life events were found to form significant associations with subjective health and well-being. Death of partner or parent and life threatening illness or injury were found to form the strongest associations with physical health. A dose-response relationship between life events and physical health in general was evident but more so for heart disease and eyesight degeneration. A dose-response relationship between adverse life events and subjective physical health but not subjective mental health was also evident.

**Discussion**

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 well-being in a population based study in Hong Kong. Overall, and in line with previous research in the area (11-13), results indicate that specific adverse life events may be associated with specific health conditions and not all adverse life events are necessarily associated with physical health. However, all tested life events had an effect on subjective physical and mental health. Death of partner or parent and life threatening illness or injury were found to form the strongest association with physical health problems. A dose-response relationship between life events and physical health in general was evident but more so for heart disease and eyesight degeneration. A dose response relationship between adverse life events and subjective physical health but not subjective mental health was also evident.

It was surprising that abuse or natural disaster did not form a significant association with diagnosed physical health conditions although all events tested found to be significantly associated with subjective physical and mental health scores. Previous research has demonstrated a strong association between these life events and physical health conditions (12). Differences between the present and previous research in the area can be attributed to cross-cultural differences between western and eastern cultures. Nevertheless, Asia – Pacific countries experience quite regularly natural disasters and for that reason may be better prepared and less affected by such (18).

It was also quite surprising that those who did experience abuse or life threatening illness were less likely to report physical health problems such as hypertension and heart disease. Similar findings have also been demonstrated for respiratory and GI illness (11) and it is quite likely that exposure to adverse life events facilitates the development of coping skills to manage emotional and physiological responses to stress that might protect against negative health outcomes. In fact, there has been evidence to suggest that low levels of stress are associated with lower rates of mental health problems than no exposure or high exposure to stress (19). This can also explain why history of life events was not significantly associated with subjective mental health. However, future research is required to establish the presence of such protective associations in other samples. Future research should also focus on longitudinal designs which are more likely to capture these associations developmentally.

Our univariate results also indicate that history of life events is associated more strongly with subjective physical health as opposed to actual physical health. Although the consequences of negative life events on objective and subjective outcomes has been well documented in previous research (20), the present is the first population study to investigate such associations in a single study. The pathways showing how adverse life events may lead to poor physical health remain unknown and there is strong evidence to suggest that this is not only in the presence of mental health conditions such as in Posttraumatic Stress Disorder (12-13). Indeed our multivariate results support this hypothesis as depression scores were not found to be associated with any of the physical health conditions. Interestingly enough, depression scores significantly predicted subjective physical and mental well-being. Overall, present evidence regarding the association between history of adverse life events and physical ill health, objective and subjective, suggest psychosocial and biological pathways to disease are closely linked. There is evidence to suggest that the stress associated with exposure to adverse life events can cause dysregulation in a number of systems including neuroendocrine (3), immune (4), metabolic (5) and cardiovascular systems (6).

The present study had several limitations. First, adverse life events and physical health outcomes were self-reported. Although these data were collected in a form of an interview, use of self-report data may bias the results. Nevertheless, there has been evidence to suggest that studies using objective measures of physical health have reported associations between mental and physical health of similar direction and magnitude as those using self-reported measures (21). It is, therefore, unlikely that self-report biases can explain these results exclusively. In addition, our data were cross-sectional in nature and no causal inferences can be drawn from non-experimental designs. Furthermore, we have not included measures of health behaviours such as alcohol use and exercise in the present study. Measures of health behaviours would be beneficial to understand the extent to which associations between adverse life events and physical health are mediated by factors such as diet and substance use. In addition, the present study did not consider age of exposure to adverse life events and onset of physical health conditions and this is particularly important for life events such as life threatening illness and injury which can lead by definition to ill health. Inclusion of health behaviour measures would also be useful in explaining unorthodox effects of demographics found in the presence study such as being married and heart disease or employment and hypertension. It would have been useful to include measures of marital strain found to mediate the relationship between marital status and heart disease (22), although more recent evidence suggests that this association is not equally strong for men and women (23). The association between being employed and hypertension can also be explained by other confounding factors such as occupational stress or hourly status which more commonly affects women (24). However, the present study has also a number of strengths. Using a population-based community sample of adults, representative of a large urban city in Asia, the present study documents robust associations between potentially adverse life events, and physical ill health, both objective and subjective.

These associations have public health implications considering the high prevalence of traumatic events in the general population and how common the conditions associated with such events are. Future research should aim to examine these associations with objective measures of physical diagnoses and life events. Future research should also aim to prospectively examine biological mediators of the impact to physical health. Considering the impact of adverse life events on health and well-being it is important to integrate a holistic approach into assessment and treatment of physical ill health including factors such as exposure to adverse life events. Health professionals should be aware of the association between adverse life events and physical ill health which can allow a more comprehensive understanding of patients’ needs.

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**Table 1.** Demographic information of sample

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Categories** | **Mean or n** | **S.D. or (%)** |
| **Age** |  | 53.2 | 19.6 |
| **Gender** | Male | 551 | 48 |
|  | Female | 596 | 52 |
| **Marital Status** | Not Married | 443 | 38.6 |
|  | Married | 704 | 61.4 |
| **Education** | Basic | 1001 | 87.3 |
|  | Advanced | 146 | 12.7 |
| **Employment** | Employed/Student | 532 | 46.4 |
|  | Unemployed | 615 | 53.6 |
| **Dependants** | Children <18 | 175 | 15.3 |
|  | Elderly>60 | 161 | 14.0 |

**Table 2.** Life events experienced

|  |  |  |
| --- | --- | --- |
| **Life Event** | **n** | **%** |
| Abuse | 90 | 7.8 |
| Death of Partner/Parent | 612 | 53.4 |
| Natural Disaster | 101 | 8.8 |
| Illness/Injury | 102 | 8.9 |
| Family Disruption | 198 | 17.3 |

**Table 3.** Physical health conditions reported

|  |  |  |
| --- | --- | --- |
| **Physical Condition** | **n** | **%** |
| Hypertension | 268 | 23.4 |
| Heart Disease | 57 | 5 |
| Osteoarthritis | 74 | 6.5 |
| Diabetes | 90 | 7.8 |
| Cancer | 5 | .4 |
| Ulcer | 5 | .4 |
| Eyesight Degeneration | 115 | 10 |
| Hearing Problems | 48 | 4.2 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Hypertension** | | | **Heart Disease** | | | **Osteoarthritis** | | | **Diabetes** | | | **Eyesight Degeneration** | | | **Hearing Problems** | | |
|  |  | **Yes**  **%** | **No**  **%** | **X2**  **p =** | **Yes**  **%** | **No**  **%** | **X2**  **p =** | **Yes**  **%** | **No**  **%** | **X2**  **p =** | **Yes**  **%** | **No**  **%** | **X2**  **p =** | **Yes**  **%** | **No**  **%** | **X2**  **p =** | **Yes**  **%** | **No**  **%** | **X2**  **p =** |
| **Death of Partner/Parent** | **Yes**  **%** | 223  19.5 | 389  34.0 | 124.5  .001 | 50  4.4 | 562  49.1 | 28.3  .001 | 63  5.5 | 549  47.9 | 31.9  .001 | 78  6.8 | 534  46.6 | 43.3  .001 | 103  9.0 | 509  44.5 | 67.0  .001 | 44  3.8 | 568  49.6 | 29.4  .001 |
| **No**  **%** | 45  3.9 | 488  42.6 | 7  .6 | 526  45.9 | 11  1.0 | 522  45.6 | 12  1.0 | 521  45.6 | 12  1.0 | 521  45.5 | 4  .3 | 529  46.3 |
| **Abuse** | **Yes**  **%** | 15  1.3 | 75  6.6 | 2.5  .069 | 5  0.4 | 85  7.4 | .1  .472 | 6  .5 | 84  7.4 | .0  .523 | 4  .4 | 86  7.5 | 1.6  .143 | 0  .0 | 90  7.9 | 10.8  .001 | 1  .1 | 89  7.8 | 2.3  .094 |
| **No**  **%** | 253  22.1 | 79970.0 | 52  4.6 | 1000  87.6 | 67  5.8 | 985  86.3 | 86  7.5 | 966  84.6 | 11410.0 | 938  82.1 | 47  4.1 | 1005  88.0 |
| **Natural Disaster** | **Yes**  **%** | 31  2.7 | 70  6.1 | 3.3  .047 | 9  .8 | 92  8.0 | 3.6  .056 | 8  .7 | 93  8.1 | .4  .323 | 12  1.0 | 89  7.8 | 2.5  .088 | 15  1.3 | 86  7.5 | 2.9  .070 | 3  .3 | 98  8.5 | .4  .375 |
| **No**  **%** | 237  20.7 | 809  70.5 | 48  4.2 | 998  87.0 | 66  5.8 | 980  85.4 | 78  6.8 | 968  84.4 | 100  8.7 | 946  82.5 | 45  3.9 | 1001  87.3 |
| **Life Threatening Illness/Injury** | **Yes**  **%** | 33  2.9 | 69  6.0 | 5.1  .019 | 15  1.3 | 87  7.6 | 22.5  .001 | 5  .4 | 97  8.5 | .4  .339 | 13  1.1 | 89  7.8 | 2.7  .048 | 17  1.5 | 85  7.4 | 5.5  .020 | 6  .5 | 96  8.4 | .8  .249 |
| **No**  **%** | 235  20.5 | 810  70.6 | 42  3.7 | 1003  87.4 | 69  6.0 | 976  85.1 | 77  6.7 | 968  84.4 | 98  8.5 | 947  82.6 | 42  3.7 | 1003  87.4 |
| **Family Disruption** | **Yes**  **%** | 43  3.8 | 155  13.5 | .4  .305 | 12  1.0 | 186  16.3 | .6  .269 | 10  .9 | 188  16.4 | .8  .238 | 12  1.0 | 186  16.2 | 1.1  .189 | 25  2.2 | 173  15.1 | 1.8  .116 | 7  .6 | 191  16.7 | .3  .393 |
| **No**  **%** | 225  19.6 | 723  63.1 | 45  3.9 | 903  78.8 | 64  5.6 | 884  77.1 | 78  6.8 | 870  75.9 | 90  7.9 | 858  74.8 | 41  3.6 | 907  79.1 |

**Table 4.** Life events and physical health

**Table 5.** Associations of physical health and sample demographics, history of adverse life events and depression

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Hypertension** | | | **Heart Disease** | | | | **Osteoarthritis** | | | **Diabetes** | | | **Eyesight Degeneration** | | | **Hearing Problems** | | | **Presence of any condition** | | |
|  | **B** | **S.E.** | **p =** | **B** | **S.E.** | **p =** | | **B** | **S.E.** | **p =** | **B** | **S.E.** | **p =** | **B** | **S.E.** | **p =** | **B** | **S.E.** | **p =** | **B** | **S.E.** | **p =** |
| **Gender** | -.26 | .18 | .16 | .19 | .30 | .52 | | 1.05 | .30 | .001 | .18 | .25 | .47 | .51 | .24 | .032 | .03 | .34 | .920 | .26 | .18 | .146 |
| **Age** | .07 | .01 | .001 | .06 | .01 | .001 | | .06 | .01 | .001 | .07 | .01 | .001 | .08 | .01 | .001 | .11 | .02 | .001 | .09 | .01 | .001 |
| **Marital Status** | .06 | .20 | .78 | .69 | .33 | .04 | | .49 | .30 | .10 | .22 | .28 | .43 | .27 | .26 | .295 | .31 | .40 | .441 | -.01 | .20 | .963 |
| **Education** | .57 | .50 | .25 |  | ∞ | |  | .87 | 1.05 | .41 | -.03 | .65 | .96 |  | ∞ |  |  | ∞ |  | .59 | .45 | .191 |
| **Employment** | 1.04 | .26 | .001 | -.17 | .48 | .72 | | .21 | .44 | .63 | .80 | .44 | .068 | .16 | .39 | .684 | -.44 | .59 | .455 | .37 | .22 | .088 |
| **Child Care** | .24 | .37 | .52 | .96 | 1.10 | .36 | |  | ∞ |  | -.11 | .58 | .85 | 1.37 | 1.04 | .186 | -.04 | 1.09 | .971 | .14 | .31 | .646 |
| **Elderly Care** | -.59 | .22 | .008 | -.34 | .41 | .40 | | -.64 | .34 | .058 | -.003 | .32 | .99 | -1.12 | .27 | .001 | -.66 | .42 | .114 | -.46 | .23 | .042 |
| **Number of Events** | .14 | .09 | .14 | .43 | .14 | .001 | | .04 | .16 | .80 | .09 | .13 | .49 | .26 | .13 | .036 | -.08 | .20 | .695 | .34 | .09 | .001 |
| **CESD Depression** | .11 | .17 | .52 | .41 | .27 | .13 | | .23 | .25 | .37 | -.26 | .25 | .31 | -.11 | .24 | .630 | .17 | .32 | .599 | .00 | .17 | .999 |
| **Model Statistics** | X2=379.2, df=9, p=.001  Nagelkerke R2=.425 | | | X2=86.5, df=9, p=.001  Nagelkerke R2=.223 | | | | X2=109.6, df=9, p=.001  Nagelkerke R2=.240 | | | X2=119.0, df=9, p=.001  Nagelkerke R2=.233 | | | X2=200.9, df=9, p=.001  Nagelkerke R2=.336 | | | X2=98.8, df=9, p=.001  Nagelkerke R2=.281 | | | X2=530.1, df=9, p=.001  Nagelkerke R2=.517 | | |

∞ scores are non-significant

**Table 6.** Associations between subjective well-being and demographics, history of adverse life events and depression

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **SFS-12 PCS** | | | **SFS-12 MCS** | | |
|  | **Beta** | **t** | **p =** | **Beta** | **t** | **p =** |
| **Gender** | .0 | -1.7 | .087 | .0 | 1.4 | .166 |
| **Age** | -.4 | -11.4 | .001 | .1 | 3.4 | .001 |
| **Marital Status** | .1 | 2.2 | .029 | .0 | -0.1 | .907 |
| **Education** | .0 | -1.3 | .207 | .0 | 0.3 | .785 |
| **Employment** | .1 | 2.0 | .051 | .1 | 1.7 | .082 |
| **Child Care** | .0 | 1.1 | .273 | .0 | 0.1 | .923 |
| **Elderly Care** | .0 | 0.2 | .878 | .0 | -1.2 | .223 |
| **Number of Life Events** | -.1 | -4.6 | .001 | .0 | -1.7 | .099 |
| **CESD Depression** | -.2 | -8.2 | .001 | -.6 | -23.6 | .001 |
| **Model Statistics** | F(9,1040)=55.175, p=.001  R2=.317 | | | F(9,1040)=66.317, p=.001  R2=.359 | | |