

**The Association of Chronic Social Stress
with Psychological Distress in Thailand¹**

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ABSTRACT

This study investigated chronic social stress emanating from troublesome interpersonal relationships, and its association with psychological distress (e.g., depressive symptoms). This was done using a model of stress and coping in which stress from sources other than personal relationships was also measured (e.g., worries about personal finances), to isolate the contribution to psychological distress of chronic social stress. The model also included measures of external coping resources (e.g., social support) and internal coping resources (e.g., hardiness).

Five-hundred and twenty-six women and men ages 25-29 and 40-44 from Maepum Sub-district, Phayao Province in North Thailand participated in this study, which used a quantitative survey methodology. Data were collected through self-completed questionnaires which included all the study measures. All study instruments were translated from English to Thai by the dual-focus method, which is concept-driven and strives to enhance the validity of a translation, rather than being translation driven. A convenience sample of 17 individuals participated in three focus groups that contributed significantly to the translation work. The translation process was highly participatory, drawing on participants' knowledge and experience of Thai language and culture and the wide range of knowledge they possess.

Multiple linear regression models were used to study the relationship of psychological distress (depressive symptoms, anxiety, and loneliness) to the predictors (a) chronic social stress (social relationship issues), (b) worries about personal

circumstances (other than social relationship issues), (c) social support, (d) self-efficacy, and (e) hardiness.

The regression analyses revealed that level of worries about personal circumstances predicted levels of loneliness, anxiety, depression, and negative affect, and was the most potent predictor among those studied. Also, the chronic social stress measure was a significant predictor of loneliness, anxiety, depression and negative affect. Turning to the measures of coping resources, the most potent predictor among the social support/network variables in the analyses of loneliness and negative affect was satisfaction with the number of good friends. Global self efficacy was important in the prediction of loneliness and depression, while hardiness explained significant variability in the analyses of depression and negative affect only.

The finding that negative as well as positive aspects of social relationships were related significantly to psychological distress is consistent with highly similar studies in Norway and Romania. The findings suggest that the stress-distress model which was used in this study, adapted from a model used in Western studies, has good utility in the Thai context.

A limitation of this study is the cross-sectional study design, in which causal relationships among predictor and predicted variables cannot be confirmed. However, even the best designed longitudinal study would have great difficulty sorting out cause and effects relationships, since the so-called predictor variables and the so-called predicted variables are thought on theoretical grounds to have reciprocal influences on one another. Another possible critique is that subjective rather than objective measures

of stress and distress are used. However, a fundamental assumption of this study and all other psychosocial stress studies is that stress and distress are constructed out of the interaction of the person (cognitions and emotions) and the environment. Thus, seemingly objective stressors may cause distress in one person and not another (e.g., great heights, crowding, arguments). Perhaps the most important limitation has been the study measures, which were adapted from Western studies. Factor analyses and other psychometric analyses revealed that for some of the measures, the expected factor structure, internal consistency of scale items, etc, was not entirely observed with these Thai data.

These limitations notwithstanding, in this study of a sample of the general Thai population, these conclusions seem warranted: (1) level of chronic social stress is related significantly to level of psychological distress, after taking into account other sources of stress, such as worried about personal circumstances (also a significant predictor); (2) the perceived availability of social support and satisfaction with social ties is significantly and negatively related to psychological distress, and (3) the intrapersonal resources self-efficacy and hardiness are also significantly and negatively related to psychological distress. This study highlights the potential importance to Thai public health of interventions to strengthen positive social ties, reduce factors that exacerbate interpersonal conflict and relationship problems, and reduce environmental stressors that cause worries about the struggles of daily living. Thus, strengthening of both the informal and formal social support infrastructure of society may have important consequences for community mental health.

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1. INTRODUCTION

1.1. Background and rationale.

Chronic social stress in its large scope includes stress processes involving interpersonal problems, but also stress due to living conditions associated with poverty, low education, gender and racial discrimination and other socially-constructed problems. Chronic social stress (chronic social stress) in its use in this study refers only to stress processes involving problems in close relationships – family, friends, neighbours, work colleagues, and so on.

Psychological distress is a general term referring to unpleasant, cognitive, emotive and mood states, and may include symptom of depression, feeling of anxiety, feeling lonely and experiencing a low mood state (Chiu & Ring, 1998; Lawrence & Bradbury, 2001; Vinokur & van Ryn, 1993).

Chronic social stress has in several countries been observed to be significantly associated with psychological distress, both in vulnerable sub-groups (e.g., ill people) and in the general population. These studies have, however, been localised in Europe and North America, and none have been conducted in Asia. The present study examines the relationship of chronic social stress to psychological distress in Thailand, and is thus the first of its kind to examine these phenomena in an Asian setting. The following is a more detailed introduction to the main points outlined above.

Most studies of chronic social stress have concentrated on “vulnerable” groups such as the frail elderly, and people with serious illness or disabilities. For example,

chronic social stress is elevated in rheumatoid arthritis patients (Holahan et al., 1997), parents of children with leukaemia (Kazak et al., 1997), amputees and otherwise disabled individuals (Williamson, 1998), and cancer patients (Andersen et al., 1994). An association between chronic social stress and psychological distress in vulnerable groups has also been reported in investigations in Thailand (Lotrakul, 2001; Norrasing, 2003).

Chronic social stress is related to psychological distress not only in vulnerable people but also in the general population. In Germany, social stress at work under low social support conditions was associated with depressive symptoms (Dormann & Zapf, 1999). The Statistics Canada's 1994 National Population Health Survey observed that social stress was significantly related to depression among younger cohorts (Wade & Cairney, 2000). The Midlife in the United States Survey (MIDUS) concluded that partner stress and support were correlated with level of well being and with health problems (Walen & Lachman, 2000).

The studies mentioned above are difficult to contrast and compare, because they used a wide mix of study measures and methods. In an effort to increase the comparability of population-based studies of chronic social stress and psychological distress, several recent studies in Norway, Romania, Russia and Thailand (the present study) used identical measures and methods. In the Norwegian study, chronic social stress, as assessed by the Bergen Social Relationships Scale (BSRS), was related significantly to depressive symptoms, anxiety and loneliness, after controlling for level of social support (Mittelmark et al., 2004a).

The Romanian study investigated chronic social stress, but also individuals' other worries (e.g., not involving problems in close relationships) ranging from worry about personal circumstances (e.g., one's personal finances) to worry about global issues (e.g., world peace). In the Romanian data, chronic social stress and worries about personal circumstances were significant predictors of psychological distress. In addition, the Romanian study assessed self-efficacy, which was significantly related to psychological distress (Bancila et al., 2004). That is to say, regardless of levels of CCS and other problems causing worry, respondents with lower self-efficacy had higher levels of psychological distress. The results of the Russian component of the overall study are not yet available.

From a cultural perspective, it may be of significance that the research model and measures of the Norwegian, Romanian and Russian studies just mentioned are based on Western conceptions of mental health, developed by Western researchers. Since the degree to which the extension of Western concepts of mental health to non-Western cultures is debatable, the study of mental health in Asian cultures with research models and measures based on Western conceptions of mental health presents a challenge. This challenge was taken up in the present investigation, in which the core research model, methods, and measures of the Norwegian and Romanian studies were employed.

A unique contribution of the present study was the inclusion of an additional coping resource, 'hardiness', referring to one's resilience in the face of obstacles and challenges (Gore, 1992). The main research objective was to determine the degree to

which the phenomena observed in the Norwegian and Romanian studies would be observed in a Thai setting. A second objective was to determine if hardiness adds significantly to the prediction of psychological distress, beyond the contributions of the other predictor variables.

2. LITERATURE REVIEW

2.1 Stress concept and approaches.

Many people think of stress as frustration or emotional tension; the biochemist and endocrinologist, as a purely chemical event; the air traffic controller, as a problem in concentration; and the sportsperson, as muscle tension (Selye, 1982). In fact, because of Selye's influence, psychology and medicine have regarded "stress" as if it was some "thing" that could destroy health and happiness even against one's will (Richmond, 2004). Selye first popularised the concept of "stress" in the 1950s. He defined "stress" based on objective indicators such as bodily and chemical change or environmental change, e.g. in weather, temperature, noise, etc. Stress in this approach is an integral part of the adaptive biological system (Levine & Ursin, 1991). The term "stress" is used for the load (input, demands, stress, stressor), as well as the processing of the load, the stress response, and the experience of the stress response (Eriksen, 1998). The load is evaluated by the brain and may result in a stress response (an alarm reaction), whenever something is missing, or when there is homeostatic imbalance or a threat or to the homeostasis or organism.

In another quite different view, the concept of stress is focused on individuals' subjective evaluations of their abilities to cope with the demands posed by specific events or experiences, and their affective response to that evaluation (John & Catherine, 2004). Stress, in this subjective approach, points out the advantages of a relational in the social environment that affect functioning rather than a stimulus-response or a stimulus-organism-response view of the problem (Lazarus & Cohen, 1977; Lazarus & Folkman, 1984; Wheaton, 1997). This view assumes that certain situations are normatively stressful, but allow for interpersonal differences in the evaluation of events. The definitions of stimulus focus on events in the environment such as being laid off from work, illness, noxious conditions or natural disasters. In this perspective, the concepts of 'stimulus' and 'response' have limited utility (Lazarus & Cohen, 1977; Lazarus & Folkman, 1984). Stress is more properly seen as a special kind of transaction, or relationship between two systems, person and environment, or between two or more intra-individual systems (Lazarus & Cohen, 1977; Lazarus & Folkman, 1984; Rook, 1998). Psychological stress therefore is an association of the individual with the environment that is appraised by the individual as taxing or exceeding his or her resources and endangering his or her well-being (Lazarus & Cohen, 1977; Lazarus & Folkman, 1984).

2.2 Interpersonal stress.

Personal relationships with friends, family members and others influence individual health and well-being. Interpersonal, in one hand, appears as a critically

important source of psychological well-being (Rook, 1998). A study on the perceived quality of life confirms that the calibre of people's personal relationships is a more powerful predictors of their happiness and life satisfaction than is the others calibre of them (Argyle, 1987; Campbell et al., 1976 in Rook, 1998). On other hand, an interpersonal can function as a source of strain, conflict, disappointment and troubled personal relationships threaten health and well-being (Rook, 1998). Many studies on common everyday stressors suggest that an interpersonal nature such as demands from others and conflicts and tensions in one's relationships arouse more distress than other kinds of stressors (Bolger et al., 1989; Veroff et al., 1981; Zautra et al., 1994 in Rook, 1998).

Emphasising on an interpersonal stress or social stress, it can be defined as processes or actions by people in one's social network that cause a person psychological distress such as shame or sadness (Henriksen, 2001; Mittelmark et al., 2004). These acts are often performed by people in a very close relationship, but negative feeling and actions can be found also on the job, in the neighbourhood, at school, and so on (Wiseman & Duck, 1995 in Henriksen, 2001). In addition, the adverse effects of interpersonal stressors continue over several days, while the effects of other stressors dispel more quickly (Bolger et al., 1989 in Rook, 1998).

Relationships in which personal regard is not balanced and not a realistic option may produce severe social strain (Henriksenn, 2001). At the other extreme, supporters are sometimes over-protective (Lehman & Hemphill, 1990), and inept support can also result in disappointments, conflicts, tensions, or unpleasantness.

2.3 The association of chronic social stress.

Interpersonal stress or social stress is related to psychological distress e.g., depression, loneliness, and negative affect (Rook, 1998). It is clear that some people develop depression after a stressful event in their lives. Events such as the death of a loved one or the end of relationship are often negative and traumatic and cause great stress for many people. The same type of stressor may lead to depression in one person, but not another. People sometimes become depressed even when there is little or no stress in their lives. Some people are depressed as a result of having to juggle with chronic stress, which may come in the form of having to juggle multiple roles at home and work, being in an abusive environment and making major changes in lifestyle, etc. (<http://www.allaboutdepression.com>). Studies on loneliness and bereavement also revealed ample evidence of the anguish, longing and despair experienced by individual who either have lost or lack of close relationships (Peplau & Perlman, 1982; Stroebe et al., 1993 in Rook, 1998).

Social stress has been associated with not only worse psychological health, but worse physiological health outcomes such as increased cardiovascular reactivity and depressed immune functioning (Rook, 1998).

Social stress is clearly not the only possible cause of psychological distress. Worries about daily life stressors and daily hassles are also positively related to psychological distress (Bancila et al., 2004). Daily hassles include the ordinary troubles of family life, noxious physical environment, the hazards and pressures of commuting to work during rush hour and so on. Although worries and daily hassles may not be as

dramatic as acute events, when prolonged their relative costs may be as high or higher (Lazarus & Cohen, 1977).

Levels of psychological distress may be moderated by internal and external coping resources (stress moderating or buffering effect). Social ties and social support are generally understood as important external coping resources, focused on indicators of social integration (Gore, 1992). The lack of social ties in many studies is a risk factor for poor health, and positive social ties enhance physical and mental functioning (Mittelmark et al., 2004; Seeman, 2000; Uchino et al., 1996; Vandervoort, 1999).

Internal coping resources, such as self-efficacy (Bandura, 1977) and hardiness (Kobasa, 1979), may also moderate stress-distress relationships (Zautra et al., 1997). Low self efficacy is associated with depression, anxiety and helplessness (Schwarzer, 1996). Hardiness has been empirically demonstrated as an effective moderator in the stress-illness relationship (Kobasa, 1979). Hardiness seemingly predisposes persons to appraise stressful events in less threatening terms, enabling them to better cope using problem-focused rather than emotion-focused strategies (Maddi, 1999; Florian et al., 1995).

Chronic social stress in this study is defined “as a transactional, cognitive process involving appraisal and relatively unsuccessful coping attempts, to resolve dissonance among cognitions about a significant others(s)” (Mittelmark et al., 2001). This study employed the measures and research models of the Norwegian and Romanian studies to investigate the association of chronic social stress with psychological distress, personal worries, and coping resources both internal and

external resources whether the results of this study are comparable to previous studies. The research model of this study is as presented in Figure 1. This figure clearly explained that interpersonal stress is hypothesised to be related to psychological distress: loneliness, anxiety, depression and negative affect. Beside interpersonal stress, psychological distress may influence by many other causes such worries about global economic, financial problem, and job problems, etc. These problems may directly effect or exacerbate psychological distress. For example, job problems can cause psychological distress as well as interpersonal friction and the friction can exacerbate psychological distress. Since the field of stress research is expansive and represents the viewpoints of several disciplines, the dynamics of stress exposure may effect from 1) subgroup vulnerability i.e. age and gender, and 2) internal coping resource (i.e. self-efficacy and hardiness) and external coping resources (i.e. social supports).

The main research objective was to determine the degree to which the phenomena observed in the Norwegian and Romanian studies would be observed also in a Thai setting. A second objective was to determine if hardiness adds significantly to the prediction of psychological distress, beyond the contributions of the other predictor variables. Responding both objectives, study hypotheses were addressed as follows:

1. Chronic social stress is significantly related to depressive symptoms, anxiety, loneliness and negative affect among men and women, in both age groups

studied – higher chronic social stress levels are related to higher distress levels.

2. Worries about matters other than personal relationships (i.e., not chronic social stress) are related significantly to depressive symptoms, anxiety, loneliness and negative affect among men and women, in both age groups studied – higher worry levels are related to higher distress levels.
3. After controlling statistically for the relationship in (2), above, the relationship in (1), above, remains statistically significant.
4. Social support, self-efficacy and hardiness are all related significantly and inversely to depressive symptoms, anxiety, loneliness and negative affect among men and women in both age groups studied.
5. After controlling statistically for the relationships in (2) and (4), above, the relationship in (1), above, remains statistically significant.

3. METHODOLOGY

This section presents the scope of this study, participants (population and sample), procedures of instrument translation work, ethics and consent procedures, data collection and data analysis methods.

3.1 The scope of this study.

This cross-sectional study on chronic social stress and its association with psychological distress was conducted in a rural community of Northern Thailand,

Maepum Sub-district during 23rd – 30th June, 2003. Most information in this study was collected from adults ages 25-29 and 40-44 by using questionnaires. The communities selected for this study were all eighteen villages of Maepum Sub-district, which is part of Muang District, Phayao Province, Thailand. Data were collected at the respondent's home or nearby area.

3.2 Participants.

Population and sample The sample frame for this study was all 1,820 men and women ages 25-29 and 40-44 registered in the national health insurance office as living in Maepum Sub-district, Thailand in 2003. Access to the population registration data was via the Health Insurance Office, Phayao Provincial Health Office.

The age groups 25-29 and 40-44 were chosen to maximise comparability with the earlier Romanian research referred to in the Introduction. From the sample frame, approximately 50% of adults in each age-gender stratum were drawn at random. The 923 selected individuals comprised the sample for this study. The sample was selected as follows:

1. The name list of 1,820 adults was batched into four strata i.e., 404 males and 405 females ages 25-29, and 501 males and 510 females ages 40-44.

2. Samples of approximately 50% were drawn randomly from all four strata: 213 males and 213 females ages 25-29, and 247 males and 250 females ages 40-44.

The total number of 923 selected persons was combined in one list that was then

sorted by number of village, printed out, and delivered to research assistants, who then contacted the potential respondents (the village chiefs received the lists as well). The sampling scheme and sampling results are shown in Figure 2.

3.3 Procedures.

Instrument translation work

Using an iterative process, all study instruments were translated from English to Thai. The translation/re-translation method, which is focused on the reliability of translation, was considered and rejected. Instead, the dual-focus methodology developed by Erkut (1999) was used. The method is concept-driven and strives to enhance the validity of a translation rather than translation driven. In practice this means a number of rounds of refinement until all collaborators are satisfied that the theoretical fundamentals of the original scales are captured (Erkut et al, 1999). A convenience sample of 17 individuals participated in three focus groups regarding translation work. The process was highly participatory drawing on these participants' knowledge and experience of Thai language and culture and the wide range of disciplinary knowledge they possess.

Questionnaires

The questionnaire contained these measures of psychological distress:

1. Loneliness scale is a six-item scale assessing loneliness (mean = 4.3; S.D. = 3.8; Cronbach's alpha = 0.77), modified slightly from a scale developed for use in

population-based studies in Western Norway (Kraft & Loeb, 1997). The items are: I feel I have enough contact with people that care about me; I often feel lonesome; I feel it is difficult to talk with people I have not met before; I feel lonely even when I am around other people; I often feel that others do not understand me or my situation; I feel that others care about me. The response four alternatives: describes me very well; describes me quite well; does not describe me very well; does not describe me at all.

2. The seven-item anxiety sub-scale of a Norwegian version of the Hospital Anxiety and Depression Scale, abbreviated the HADS-A (mean = 4.7; S.D. = 3.3; Cronbach's alpha = 0.81). The HADS-A has a Cronbach's alpha of between 0.78 and 0.93 in a range of studies and correlates well with other widely used scales having similar measurement purposes (Bjelland et al., 2000). The distinct advantage of the HADS-A is its brevity. Items are (response frame 'feelings during the last week'): I feel tense or wound up; I get a sort of frightened feeling as if something awful is about to happen; Worrying thoughts go through my mind; I can sit at ease and feel relaxed; I get a sort of frightened feeling like 'butterflies' in the stomach; I feel restless and I have to be on the move; I get sudden feelings of panic.

3. The seven-item depression sub-scale of a Norwegian version of the Hospital Anxiety and Depression Scale, abbreviated the HADS-D (mean = 3.1; S.D. = 3.9; Cronbach's alpha = 0.78). The HADS-D has a Cronbach's alpha of between 0.82 and 0.90 in a range of studies and correlates well with other widely used scales having similar measurement purposes (Bjelland et al., 2000). The distinct advantage of the HADS-D, like the HADS-A, is its brevity. Items are (response frame 'feelings

during the last week’): I still enjoy the things I used to enjoy; I can laugh and see the funny side of things; I feel cheerful; I feel as if I am slowed down; I have lost interest in my appearance; I look forward with enjoyment to things; I can enjoy a good book or radio or TV programme.

4. Negative affect was measured with the NA sub-scale of the Positive and Negative Affect Scale (PANAS) with general time instruction for response, with mean = 18.1, S.D. = 5.9 and Cronbach’s alpha = 0.87, see Watson and Clark, (Watson, 1988). The first set of responses is prefaced by the written instruction: “Below are some words for different feelings. Read each word and indicate how you usually feel, by putting an X in the appropriate box”. The feelings are expressed by the following words: distress; upset; guilty; scare; hostile; irritable; ashamed; nervous; jittery; afraid. The response five alternatives: very seldom or not at all; seldom; now and then; often; very often.

The questionnaire contained these measures of stress:

1. The Bergen Social Relationships Scale (BSRS) is a six-item scale, with mean = 4.5, S.D. = 3.7, Cronbach’s alpha = 0.76, see Mittelmark, et al. (2004). The six items are prefaced by the written instruction: ‘think about everyone you know (children, parents, siblings, spouse or significant other, neighbours, friends, colleagues and others) while you answer the following: (Mark one choice for each statement by putting X in the appropriate box). Items are: there are people in my life that I care about, but who dislike one another; there is a person in my life that needs my help, but

whom I don't know how to help; there is an important person in my life that wants to support me, but who often hurts my feelings instead; there is a person I have to be around almost daily that often henpecks me; there are people that make my life difficult because they expect too much care and support from me; there is someone I care about that expects more of me than I can manage. The response four alternatives: describes me very well; describes me quite well; does not describe me very well; does not describe me at all.

2. The Bergen Personal Worries Scale (BPWS) measures people's degree of worry about daily life stressors in their personal lives, but does not include items about their inter-personal relationships. It was developed in English for the purpose of this study at the University of Bergen, and a translated beta version was tested in Sibiu, Romania, with three focus groups drawn from the main sample of the study (mean = 17.6, S.D. = 9.6, Cronbach's alpha = 0.83, see Bancila, et al. 2004). The final version contains eleven items, with the response frame 'My feelings during the past month' and a response of five alternatives format including not worried, a little worried, somewhat worried, quite worried, and extremely worried. The items are a member of my family, my job security, my financial situation, my time pressure, my physical health, my responsibility at work, my personal safety, my mental health, my unpaid bills, my responsibilities to my family, and health care services.

3. The Bergen Community Worries Scale (BCWS) measures people's degree of worry about daily life stressors in other things. It was developed in English for the purpose of this study at the University of Bergen. The final version contains six items,

with the response frame 'My feelings during the past month' and a response of five alternatives format including not worried, a little worried, somewhat worried, quite worried, and extremely worried. The items are the world economy, the national economy, wars throughout the world, crime in the community, drugs in schools, and the political stability in the country.

The questionnaire contained these measures of coping resources:

1. General self-efficacy was measured with the Generalised Self- efficacy Scale (GSES) of Schwarzer and Jerusalem (see Scholz, et al., 2002). In a composite analysis using data from 25 countries, the GSES mean = 29.55, S.D. = 5.32, Cronbach's alpha = 0.86 (Scholz et al., 2002). The items are: I always manage to solve difficult problems if I try hard enough; If someone opposes me, I can find means and ways to get what I want; It is easy for me to stick to my aims and accomplish my goals; I am confident that I could deal efficiently with unexpected events; Thanks to my resourcefulness, I know how to handle unforeseen situations; I can solve most problems if I invest the necessary effort; I can remain calm when facing difficulties because I can rely on my coping abilities; When I am confronted with a problem, I can usually find several solutions; If I am in trouble, I can usually think of a solution, I can usually handle whatever come my way. The response four alternatives: not at all true; hardly true; moderately true; exactly true.

2. Hardiness was measured with 15-items hardiness scale includes 3 sub-scales, 5 items each to measure the sub-dimensions of commitment, control, and

challenge (Cronbach's alpha = 0.83, see (Bartone, 1995). Commitment refers to imputes meaning and purpose to self, others, and work; control, a sense of autonomy and influence on one's future; and challenge, a zest and excitement for life which is perceived as opportunities for growth. The items are: Most of my life gets spent doing things that are worthwhile; Planning ahead can help avoid most future problems; I don't like to make changes in my everyday schedule; Working hard doesn't matter, since only the bosses profit by it; Changes in routine are interesting to me; By working hard you can always achieve your goals; I really look forward to my work; If I'm working on a difficult task, I know when to seek help; Most of the time, people listen carefully to what I say; Try your best at work really pays off in the end; It bothers me when my daily routine gets interrupted; Most days, life is really interesting and exciting for me; I enjoy the challenge when I have to do more than one thing at a time; I like having a daily schedule that doesn't change very much; When I make plans I'm certain I can make them work.

3. Positive social ties was measured these items: (a) the availability of a confident, and the availability of instrumental support (can borrow money for a short period), each with four point response scales ranging from 'describes me very well' to 'does not describe me at all'; (b) marital status with four response options: married or living as in marriage, single, divorced, widow(er); (c) satisfaction with number of good friends, with the response scale no/yes; (d) frequency of participation in social groups activities with four response options: never or only few times a year, one to three times a month, about once a week, and more than once a week.

Other analysis variables were gender and age in two categories: 25-29 and 40-44 years old.

3.4 Ethics and consent procedures.

A letter of request from the Director of the Graduate Programme in Health Promotion, University of Bergen was submitted to the Provincial Chief Medical Officer, Phayao Provincial Health Office, Phayao Province in order to obtain permission for data collection and access to population data base. A letter from the author of this report (in the Thai language) was submitted as well. Both letters were sent to Maepum Sub-district Chalermphrakiat Health Centre where outpatient care is provided by a doctor and other health professionals in the Primary Care Unit. The chief of Maepum Sub-district Chalermphrakiat Health Centre and the director of Maepum Sub-district Primary Care Unit were contacted and informed about this study including research objectives and the proposed process of data collection. The chief of Maepum Sub-district Chalermphrakiat Health Centre assigned a professional as fieldwork consultant. Regarding the permission and support for data collection, the chief of Maepum Sub-district Chalermphrakiat Health Centre authorised the fieldwork consultant to write an official letter to the head village health volunteers and to the village chiefs, together with the name list of all selected individuals by village.

Before questionnaire distribution, the research assistants informed potential selected individuals about the purpose of the study and their right to participate or not.

The participants were also informed about the expected duration of answering the questionnaires and their freedom to discontinue participation at any time. The research assistants then made appointments with the agreeable respondents, delivered the questionnaires, collected the completed questionnaires enclosed in sealed blank envelopes after one week. The collected data were delivered to the researcher and treated as confidential documents.

3.5 Data collection.

The data collection process is illustrated in Figure 3. The research assistants were provided the name lists and packets of questionnaires, pens, and information letters for the participants, all of these in not labelled envelopes. They were trained to distribute questionnaires, to collect them in sealed blank envelopes, and to bring them back after one week. The research assistants visited the participants at their homes. The selected individuals were informed about the purpose of research and asked if they were willing to participate in the study. All those who expressed willingness received a research packet. Those who had literacy problems were allowed to ask for support from family member or others for reading and writing, but it was stressed all answers must be selected by the participants. The interval allowed for answering the questionnaire was approximately one week. Research assistants and the respondents made appointments to return the completed questionnaires after completion.

The research assistants collected the completed questionnaires in the sealed blank envelopes from the respondents. On behalf of the researcher, the research

assistants thanked them for the returned questionnaires. The research assistants delivered the returned questionnaires to the researcher as the last step.

3.6 Data analysis methods.

The Statistical Package for the Social Science for Windows (SPSS) version 11.5 was used for descriptive data analysis, reliability analysis, prevalence rate calculations, bi-variate comparisons, factor analyses, and multiple-regression modelling. Factor analysis was used to determine the factor structure of measurement instruments. Correlation analysis was used to measure inter-item and inter-scale correlations. Multiple regression was used to test the study's hypotheses.

4. RESULTS

4.1 Descriptive statistics.

Descriptive statistics for the study scales are presented in Table 1. Scores of BSRS ranged from 0 to 18, with the mean of 7.8 (S.D. = 3.7). Scores of HADS-A and HADS-D ranged from 0-18 and 0-17, with the means of 6.4 (S.D. = 2.5) and 4.6 (S.D. = 2.4), respectively. Scores of LOS ranged from 0 to 18, with the mean of 6.9 (S.D. = 3.4). Scores of BPWS and BCWS ranged from 0-44 and 0-24, with the means of 23.2 (S.D. = 10.1) and 9.4 (S.D. = 5.4), respectively. Scores of PANAS-NA ranged from 0 to 36, with the mean of 12.4 (S.D. = 5.7). Moreover, scores of GSES ranged from 0 to

30, with the mean of 15.8 (S.D. = 5.9), and scores of HS ranged from 7 to 33, with the mean of 19.9 (S.D. = 5.3).

4.2 Reliability analysis and factor analysis.

Inter-item correlations, item-total correlations, and Cronbach's alphas for each scale as a whole and with each item deleted were examined. The results for the BSRS are displayed in Table 2. The inter-item correlations for BSRS ranged from 0.17 to 0.34, and the item-total correlation ranged from 0.36 to 0.45. Cronbach's alpha for the BSRS was 0.67. Cronbach's alpha with various items deleted ranged from 0.60 to 0.64, indicating significant contributions to the scale's internal validity of each item. In factor analysis using a principal component method and without rotation, the BSRS had a unifactoral structural with factor loadings ranging from 0.57 to 0.67.

As shown in Table 3, inter-item correlations for HADS-A ranged from 0.06 to 0.39, and the item-total correlations ranged from 0.22 to 0.53. Cronbach's alpha for the HADS-A was 0.67. Item 4 (I can sit at ease and feel relaxed) had the poorest fit in the scale, with the lowest item-total correlation (0.22), the lowest effect on Cronbach's alpha if deleted (0.67) and the lowest factor loading (0.38).

Inter-item correlations for HADS-D ranged from 0.01 to 0.24, and the item-total correlation ranged from 0.15 to 0.43 (Table 4). Cronbach's alpha for the HADS-D was 0.54. The poorest fitting item was 'I look forward with enjoyment to things' (item-total correlation = 0.15, Cronbach's alpha if item deleted = 0.53 and a factor loading = 0.35).

The inter-item correlations for the LOS ranged from 0.01 to 0.51 and the item-total correlation ranged from 0.24 to 0.53 (Table 5). Cronbach's alpha for the LOS was 0.64. Two items had relatively poor fit with the scale, 'I feel I have enough contact with people that care about me' and 'I feel that others care about me'. They have in common that these are the only two of the six items that are negatively stated.

As shown in Table 6, inter-item correlations for the PANAS-NA ranged from 0.11 to 0.63, and item-total correlation ranged from 0.28 to 0.52. Cronbach's alpha for the PANAS-NA was 0.78 (however the interpretability of Cronbach's alpha is diminished for scales such as the PANAS-NA which has a relatively large number of items). The item 'hostility' had the poorest fit (item-total correlation = 0.28, Cronbach's alpha if item deleted = 0.78 and a factor loading = 0.39).

Table 7 shows that inter-item correlations for BPWS ranged from 0.30 to 0.59, and item-total correlation ranged from 0.51 to 0.71. Cronbach's alpha for the BPWS was 0.89. In factor analysis using principal component method and without rotation, the BPWS had a unifactoral structural with factor loadings range 0.56 to 0.78.

Table 8 shows that inter-item correlations for BCWS ranged from 0.23 to 0.64, and item-total correlation ranged from 0.41 to 0.65. Cronbach's alpha for the BCWS was 0.82. As for the other scales, the BCWS had a unifactoral structural with factor loadings range 0.53 to 0.79.

Inter-item correlations for GSES ranged from 0.26 to 0.56, and item-total correlation ranged from 0.45 to 0.66. Cronbach's alpha for the GSES was 0.86. The

GSES had a unifactorial structural with factor loadings range 0.54 to 0.74 as shown in Table 9a-b.

The results, displayed in Table 10a-b, show that inter-item correlations for HS ranged from 0.01 to 0.42 and item-total correlation ranged from -0.08 to 0.45.

Cronbach's alpha for the HS was 0.54. Cronbach's alpha for the HS (excluded item numbers 3, 4, 11, and 14) was 0.77, indicating a poor fit of these items with the scale.

In factor analysis the HS had a unifactorial structural with factor loadings range 0.39 to 0.68, and with two items having loadings of 0.40 and lower.

4.3 Correlation matrix.

Inter-correlations among the LOS, HADS-A, HADS-D, BSRS, PANAS-NA, BPWS, BCWS, GSES, and HS were examined. As shown in Table 11, the correlations among the four distress measures (depressive symptoms, anxiety, loneliness and negative affect) ranged from 0.19 to 0.46. The correlations among the three stress measures (BSRS, BPWS and BCWS) ranged from 0.00 to 0.51. The correlation between the two personal coping resource scales, GSES and HS, was 0.61, the highest correlation coefficient among the study scales.

4.4 Prevalence of chronic social stress.

Table 12 displays results for each scale item separately for women and men. Prevalence ranged from 32% to 54% among women and from 31% to 54% among men, with no statistically significant gender differences.

Figure 4 presents the cumulative prevalence of the number of chronic social stress, ranging from none to all six of the stressors. About 86% of men and 85% of women reported at least one stressor. Among women, 45% reported three or more stressors, while the corresponding prevalence among men was 47%.

4.5 Regression models.

A series of regression models were generated with the four psychological distress measures as the predicted variables (LOS, HADS-A, HADS-D, and PANAS-NA). The predictors were entered in five blocks (models). Model one included age and gender. Model two added the social support/network variables marital status, satisfaction with number of good friends, participation in social activities, perceived availability of a confidant, and perceived availability of financial support. Model three added the stress variables BSRS, BPWS, and BCWS. Model four added the GSES. Model five added the HS. In preliminary analyses the social self-efficacy scale was observed to be unrelated to any of the psychological distress measures, and was therefore not included in the regression analyses.

In the model in which loneliness was the predicted variable (Table 13), adjusted R^2 increased from 0.00 to 0.11 and 0.23 when the social support/network variables were added in the second model and the stress variables were added in the third model. The addition of GSES in the fourth model increased significantly adjusted R^2 to 0.24, while the addition in the fifth model of the HS in the fifth model did not improve R^2 at all. Examining the standardised Beta coefficients, 'perceived availability

of a confidant' was a significant predictor in model two and three, but lost significance after the generalised self-efficacy variables were added. The BSRS was a significant predictor in models 3-5.

In the model in which anxiety was the predicted variable (Table 14), the only significant increase in adjusted R^2 (to 0.13) was achieved in the third model in which the stress variables were added. In the final model, the only significant predictors were the three measures of stress and gender (women having higher anxiety scores). The personal worries stress measure outweighed all the other independent variables in its predictive utility, with a Beta of 0.35 in the final model.

In the model in which depression was the predicted variable (Table 15), adjusted R^2 increased significantly to 0.07 and 0.15 respectively, when the social support/network variables were entered in the second model and the stress variables were added in the third model. The addition of GSES in the fourth model and the HS in the fifth model also increased adjusted R^2 significantly to 0.19. Age emerged as a significant predictor in the later models, with a Beta of 0.12 in the final model (age group 40-44 had the highest depression scores). In a pattern distinct from that in the analysis of anxiety, only the 'perceived availability of a confidant' social support/network variable was a significant predictor of depression score. However, as was the case in the analysis of anxiety, the personal worries stress variable outweighed all the other independent variables in its predictive utility, with a Beta of 0.29 in the final model. Nevertheless, the chronic social stress variable was a significant predictor in models 3-5.

In the model in which negative affect was the predicted variable (Table 16), adjusted R^2 increased significantly to 0.03 and 0.12 respectively, when the social support/network variables were entered in the second model and the stress variables were added in the third model. Similar to the analyses of anxiety and of depression, the personal worries stress variable outweighed all the other independent variables in its predictive utility, with a Beta of 0.28 in the final model, and the chronic social stress variable was a significant predictor in models 3-5.

Examining the results across the analyses of the four psychological distress variables, the personal worries variable (BPWS) explained more of the variability in loneliness, anxiety, depression, and negative affect than did any other predictor. The most potent predictor among the social support/network variables was 'satisfaction with number of good friends' in the analyses of loneliness and negative affect. The chronic social stress measure (BSRS) was a less potent predictor than was the BPWS, but was nevertheless a significant predictor of all four psychological distress measures. The GSES was important in the prediction of loneliness and depression, while the HS explained significant proportions variability only in the analyses of depression and negative affect.

5. DISCUSSION

This study investigated the association between chronic social stress caused by relationship problems and psychological distress among Thai adults. It used measures and a research model developed in earlier Norwegian (Mittelmark et al., 2004) and

Romanian researches (Bancila et al., 2004). A main objective of this study was to determine if the stress-distress phenomena observed in those European studies are observable also in an Asian culture. A particular interest was to determine if chronic social stress would remain a significant predictor of psychological distress after taking into consideration other kinds of stress not directly related to interpersonal relationship problems. A second objective was to extend the research model by adding the measurement of hardiness, conceptualised as an intrapersonal coping resource. Similar to the Romanian study, this study included a measure of generalised self-efficacy.

In a preliminary analysis of this study but not reported in results due to space constraints, the Norwegian and the Romanian analysis was replicated, and the results were the same. Indeed, as in the Norwegian and the Romanian studies, the present research observed in the Thai setting that chronic social stress was a statistically significant predictor of psychological distress, even after controlling for social support/network variables and controlling for other stressors. The findings supports the first hypothesis of this study i.e., that chronic social stress is related to psychological distress among men and women, in both age groups studies – higher chronic social stress levels are related to higher distress levels. The measure of chronic social stress used, the BSRS, was consistently among the statistically significant predictors of loneliness (Beta = 0.24), anxiety (Beta = 0.09), depression (Beta = 0.10), and negative affect (Beta = 0.14), but was nevertheless a less potent predictor that was the BPWS.

Interestingly, marital status was not a significant predictor of any of the psychological distress measures. However, a study on involuntary child absence syndrome and depression in males after relationship breakdown revealed that married and repartnered males have less depression than separated males (Smith & Wang, 2000). Similarly, another study in Thailand on stress and coping behaviour of nurses working at the inpatient department of Suanprung psychiatric hospital showed that nurses who had separated marital status felt more stress than single, divorced or married status (Ploylermsang, 2001). In the Norwegian and Romanian studies, marital status was a significant predictor of loneliness, but not of anxiety or depression (they did not include measures of negative affect in the Norwegian study). At the same time, satisfaction with the number of good friends and the perceived availability of a confidant were important predictors in the Norwegian and Romanian studies, as in the Thai study. Taken together, the results suggest that functional rather than structural aspects of social network hold the most significance as regards mental well-being. This is in concert with a large literature that has reached a similar conclusion (Cohen, 1985; Lakey, 2000).

Returning to the subject of stress, one of the reasons that the Romanian study -- and the present study -- included measures of stress other than that related to interpersonal problems was the possibility that chronic social stress is only indirectly related to psychological distress, through its association with other types of stress (the so-called 'third variable' problem). The BPWS and the BCWS measures were created to test this possibility in the Romanian study. Indeed, the BPWS was a very potent

predictor of loneliness (Beta = 0.26), anxiety (Beta = 0.35), depression (Beta = 0.29) and negative affect (Beta = 0.28) in the present study. These findings are comparable to those of the Romanian study, which also included all three stress measures: the BSRS, the BPWS and the BCWS. This finding supports the second hypothesis: worries about matters other than that personal relationship (i.e. not chronic social stress) are related significantly to psychological distress among men and women, in both age group studies – higher worry levels are related to higher distress levels.

The third hypothesis also supported that chronic social stress remains significantly related to loneliness, anxiety, depressive symptom, and negative affect among men and women, in both age groups, after controlling statistically for the relationship between personal worries and psychological distress.

The findings of this study could not reject the fourth hypothesis i.e. social support, self-efficacy and hardiness are all related significantly and inversely to loneliness, anxiety, depressive symptom and negative affect. Social support also exerted significant explanatory power in the predictions of loneliness, anxiety, depression and negative affect in the present study. In the analysis of loneliness, the two significant predictors were ‘satisfaction with number of good friends’ and ‘participation in social activities’. However, in the model in which anxiety was the predicted variable, ‘perceived availability of financial support’ was the only significant predictor among the social support/network variables. Further, ‘perceived availability of a confidant’ was the only social support/network variable that was a significant predictor of depression, and ‘satisfaction with number of good friends’ was

the only significant predictor of negative affect. Social support, in this study, was negative associated with psychological distress excepted 'perceived availability of financial support' exerted positive significant power to anxiety. That the various measures of social support/network had different relationships to the various measures of psychological distress is interesting and difficult to explain. Why, for example, is perceived availability of a confident associated with lower levels of depression, but not lower levels of loneliness, anxiety and negative affect? There is the possibility of chance differences, and also the possibility that distinct types of support availability have highly specific protective functions related to mental well being. At the least, these findings seem to corroborate the results of factor analysis studies with the Norwegian, Romanian and Thai data, in which the four psychological distress measures were found to be inter-related, yet psychometrically distinct components.

Moving now to the subject of intrapersonal coping resources, generalised self-efficacy was a significant predictor of loneliness and of depression. This is consistent with the results of the Romanian study, where generalised self-efficacy was also related to psychological distress (Bancila et al., 2004).

An additional measure of personal coping resource, hardiness, was included in the present study that was not in the Romanian study. The HS was related significantly to depression and negative affect, confirming other recent findings that hardiness may moderate the stress-illness relationship (Brooks, 2003; Gore, 1992; Maddi, 1999).

Regarding the fifth and final hypothesis, chronic social stress remained a statistically significant predictor of loneliness, anxiety, depressive symptom, and negative affect, after controlling statistically for all the other predictors in the model.

Overall, the results of the present study regarding stressors and distress can be summed up rather succinctly: with but one exception, all the stress measures were associated with all the distress measures, consistent with Gore's social psychological model of distress (Gore, 1992), in which stress of many varieties has a wide range of consequences for mental well-being. Perhaps of greater interest is that the measures designed to assess stress across cultural contexts – the BSRS, BPWS and BCWS – seem to have about the same psychometric properties and bear about the same relationships to psychological distress in this study as in the precursor European studies. This is strong evidence that the underlying model of stress-distress is equally relevant in at least one Asian culture, the Thai, as it is in the two European cultures of Norway and Romania.

The chronic social stress-distress relationship conceptualised in this study and the previous studies in Norway and Romania is viewed as a fundamental psychological phenomenon, intransigent in the face of time, place, age, gender, and culture (Bancila et al., 2004; Mittelmark et al., 2004a). Thus it was expected that neither gender nor age would influence significantly the stress-distress relationships under study. The results of the various regression models support the assumption of intransigence. Even though gender was a predictor of anxiety and age was a predictor of depression, these relationships did not modify the basic relationship between the

stress variables and the distress variables. Overall, age and gender effects were modest in the present study, and not present in the Norwegian and Romanian studies, suggesting that chronic social stress is as relevant a factor to psychological health for men as it is for women, and for younger people as it is for older adults. This impression may not resist further study with very young and very old people, not included in the present sample due to practical limitations.

Summarising all the above, the overall findings of the present study are generally comparable to the Norwegian and Romanian results – chronic social stress is related significantly to psychological distress even after other types of stress and social and intrapersonal coping resources are accounted for. Yet, weaknesses of this study temper this conclusion. Before addressing real weaknesses, however, the issue of the cross-sectional study design requires attention. An almost automatic critique of any cross-sectional study is that it is not longitudinal and therefore causal relationships among predictor and predicted variables cannot be confirmed. Although basically a reasonable critique, even a sound longitudinal study cannot necessarily confirm causal direction, especially in transactional phenomena – that is, phenomena wherein variables have reciprocal influence on one another.

The stress-distress relationship is profoundly reciprocal. Relationship problems, for example, can increase feelings of depression, which in turn can exacerbate relationship problems, and so on in much iteration. The initial precipitant may be depression, or relationship problems, but that rather quickly loses practical significance. It is the ongoing, dynamic transaction between relationship problems and

depression that is of greatest interest, not what came first back at the start of the transaction. Diagrammatically, transactions between two phenomena such as stress and distress are indicted with double-headed arrows, and these types of relationships can be studied in cross-section studies almost as well as in longitudinal studies, especially when the data are subjective (self-report).

That leads to consideration of another common critique of studies such as the present one, that subjective rather than (preferred) objective measures of stress and distress are used. However, a fundamental assumption of this study and all other stress studies of its ilk is that social stress is constructed by individuals through perceptual and cognitive processes, and cannot be measured objectively. For some people, and under some circumstances, a stiff argument with a good friend is refreshing and invigorating, while for other people or in other circumstances, a similar argument could be devastating. Thus, in the conceptual framework within which this study was conducted, self-report measures were the only possible measures of respondents' experiences with social stress and of their emotional state and mental well-being.

There are, of course, real weaknesses in the present study that require consideration. Confidence in the construct validity of the underlying model could be enhanced. The tests of construct equivalence revealed worrisome non-equivalence for the LOS, HADS-A, HADS-D and HS. The factor analyses showed that the standard forms of these measures fit the Thai data rather poorly. Modifications involving removing various scale items would have improved their psychometric properties.

However, to maintain comparability with the similar studies in Norway and Romania, the original scales were maintained despite the flaws in fit.

The conceptualisation and measurement of intrapersonal resources for coping with stress are averred for improvement. In this study, intrapersonal resources for coping with stress were represented by self-efficacy and hardiness. Other theoretically relevant resources such as mastery and locus of control might have also been assessed.

The findings of this study add support to other research concluding that, in the general population: (1) chronic social stress is an important determinant of level of psychological distress, (2) the perceived availability of social support and satisfaction with social ties protects one from psychological distress, and (3) intrapersonal resources such as self-efficacy and hardiness help one to cope with psychological distress. This study thus highlights the potential importance to Thai public health of interventions to strengthen positive social ties, reduce factors that exacerbate interpersonal conflict and relationship problems, and reduce environmental stressors that cause potentially preventable worries about the struggles of daily living. Thus, strengthening of both the informal and formal social support infrastructure of society may have important consequences for community mental health.

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Table 1. Descriptive statistics for scales used in the Thai study.

Scales	Range	Mean	S.D.	Skewness	Kurtosis	Cronbach's alpha
Bergen Social Relationships Scale (BSRS)	0-18	7.8	3.7	0.28	-0.22	0.67
Hospital Anxiety and Depression Scale, Anxiety sub-scale (HADS-A)	0-21	6.4	2.5	1.19	3.16	0.68
Hospital Anxiety and Depression Scale, Depression sub-scale (HADS-D)	0-21	4.6	2.4	0.75	1.53	0.55
Loneliness Scale (LOS)	0-18	6.9	3.4	0.36	-0.06	0.64
Social Support single items						
Bergen Personal Worries Scale (BPWS)	0-44	23.2	10.1	0.08	-0.78	0.89
Bergen Community Worries Scale (BCWS)	0-24	9.4	5.4	0.46	-0.23	0.82
Positive and Negative Affect Scale, Negative Affect (PANAS-NA)	0-40	12.4	5.7	0.56	0.43	0.78
Generalised Self-efficacy Scale (GSES)	0-30	15.8	5.9	0.20	-0.51	0.86
Hardiness Scale (HS)	0-45	19.9	5.3	0.01	-0.50	0.77

Table 2. Inter-item correlations, Cronbach's alphas, and factor loadings for BSRS.

Items in the scale	2	3	4	5	6	Item-total correlation	Cronbach's alpha if item is deleted	Factor loadings ¹
1. There are people in my life that I care about, but who dislike one another.	.31**	.23**	.24**	.22**	.25**	.40	.62	.61
2. There is a person in my life that needs my help, but I do not know how to help.		.21**	.17**	.17**	.30**	.36	.64	.57
3. There is an important person in my life that wants to support me, but who often hurts my feeling instead.			.19**	.29**	.23**	.36	.64	.57
4. There is a person I have to be around almost daily that often henpecks me.				.31**	.28**	.38	.63	.59
5. There are people that make my life difficult because they expect too much care and support from me.					.34**	.43	.61	.65
6. There is someone I care about that expects more of me than I can manage.						.45	.60	.67
Cronbach's alpha for BSRS = 0.67.								

¹Extraction Method: Principle Component Analysis. 1 components extracted.

** Correlation is significant at the $p \leq 0.01$ level (2-tailed).

Table 3. Inter-item correlations, Cronbach's alphas, and factor loadings for HADS-A.

Items in the scale	2	3	4	5	6	7	Item-total correlation	Cronbach's alpha if item is deleted	Factor loadings ¹
1. I feel tense or "wound up"	.20**	.37**	.25**	.17**	.37**	.26**	.47	.61	.66
2. I get a sort of frightened feelings as if something awful is about to happen		.16**	.06	.20**	.30**	.19**	.30	.65	.49
3. Worrying thoughts go through my mind			.15**	.17**	.25**	.20**	.36	.63	.57
4. I can sit at ease and feel relaxed				.07	.20**	.11**	.22	.67	.38
5. I get a sort of frightened feeling like "Butterflies" in the stomach					.34**	.32**	.36	.63	.56
6. I feel restless as I have to be on the move						.39**	.53	.57	.74
7. I get sudden feelings of panic							.41	.61	.63

Cronbach's alpha for HADS-A = 0.67. Cronbach's alpha for HADS-A (excluded item number 4) = 0.68.

¹Extraction Method: Principle Component Analysis. 1 components extracted.

** Correlation is significant at the $p \leq 0.01$ level (2-tailed).

Table 4. Inter-item correlations, Cronbach's alphas, and factor loadings for HADS-D.

Items in the scale	2	3	4	5	6	7	Item-total correlation	Cronbach's alpha if item is deleted	Factor loadings ¹
1. I still enjoy the things I used to enjoy	.21**	.19**	.16**	.22**	.10*	.21**	.34	.43	.61
2. I can laugh and see the funny side of things		.19**	.07	.07	.20**	.24**	.31	.45	.57
3. I feel cheerful			.23**	.10*	.13**	.22**	.32	.45	.60
4. I feel as if I am slowed down				.17**	-0.03	.14**	.21	.49	.47
5. I have lost interest in my appearance					.02	.09*	.20	.50	.41
6. I look forward with enjoyment to things						.01*	.15	.53	.35
7. I can enjoy a good book or radio or TV program							.30	.45	.59

Cronbach's alpha for HADS-D = 0.54. Cronbach's alpha for HADS-D (excluded item number 6) = 0.55.

¹Extraction Method: Principal Component Analysis. 1 components extracted.

* Correlation is significant at the $p \leq 0.05$ level (2-tailed).

** Correlation is significant at the $p \leq 0.01$ level (2-tailed).

Table 5. Inter-item correlations, Cronbach's alphas, and factor loadings for LOS.

Items in the scale	2	3	4	5	6	Item-total correlation	Cronbach's alpha if item is deleted	Factor loadings ¹
1. I feel I have enough contact with people that care about me.	.11*	.03	.17**	.12**	.41**	.25	.65	.37
2. I often feel lonesome.		.26**	.41**	.39**	.12**	.43	.58	.68
3. I feel it is difficult to talk with people I have not met before.			.34**	.34**	.01	.32	.63	.57
4. I feel lonely even when I am around other people.				.51**	.12**	.53	.54	.78
5. I often feel that others do not understand me or my situation.					.13**	.50	.55	.76
6. I feel that others care about me.						.24	.65	.35

Cronbach's alpha for LOS = 0.64.

¹ Extraction Method: Principal Component Analysis. 1 components extracted.

* Correlation is significant at the $p \leq 0.05$ level (2-tailed).

** Correlation is significant at the $p \leq 0.01$ level (2-tailed).

Table 6. Inter-item correlations, Cronbach's alphas, and factor loadings for PANAS-NA.

Items in the scale	2	3	4	5	6	7	8	9	10	Item-total correlation	Cronbach's alpha if item is deleted	Factor loadings ¹
1. Distressed	.40**	.25**	.27**	.21**	.44**	.26**	.18**	.30**	.36**	.52	.75	.65
2. Upset		.18**	.23**	.12**	.63**	.18**	.27**	.21**	.22**	.48	.76	.61
3. Guilty			.33**	.18**	.14**	.29**	.16**	.24**	.18**	.36	.77	.48
4. Scared				.11**	.25**	.24**	.27**	.33**	.36**	.46	.76	.57
5. Hostile					.16**	.29**	.12**	.16**	.21**	.28	.78	.39
6. Irritable						.22**	.24**	.26**	.30**	.51	.75	.65
7. Ashamed							.30**	.31**	.34**	.45	.76	.58
8. Nervous								.35**	.33**	.42	.77	.55
9. Jittery									.45**	.49	.77	.64
10. Afraid										.52	.75	.66

Cronbach's alpha for PANAS-NA = 0.78.

¹ Extraction Method: Principal Component Analysis. 1 components extracted.

* Correlation is significant at the $p \leq 0.05$ level (2-tailed).

** Correlation is significant at the $p \leq 0.01$ level (2-tailed).

Table 7. Inter-item correlations, Cronbach's alphas, and factor loadings for BPWS.

Items in the scale	2	3	4	5	6	7	8	9	10	11	Item-total correlation	Cronbach's alpha if item is deleted	Factor loadings ¹
1. A member of my family	.52**	.36**	.33**	.32**	.31**	.36**	.36**	.31**	.44**	.28**	.51	.89	.56
2. My job security		.51**	.40**	.40**	.40**	.43**	.45**	.39**	.47**	.38**	.62	.88	.69
3. My financial situation			.42**	.46**	.35**	.42**	.45**	.53**	.49**	.30**	.62	.88	.69
4. My time pressure				.44**	.37**	.38**	.46**	.37**	.37**	.37**	.55	.89	.63
5. My physical health					.37**	.51**	.55**	.40**	.45**	.47**	.63	.88	.70
6. My responsibilities at work						.56**	.49**	.41**	.55**	.49**	.61	.88	.69
7. My personal safety							.59**	.42**	.47**	.46**	.66	.88	.74
8. My mental health								.46**	.57**	.53**	.71	.88	.78
9. My unpaid bills									.53**	.36**	.60	.89	.68
10. My responsibilities to my family										.51**	.70	.88	.77
11. Health care services											.59	.89	.67

Cronbach's alpha for BPWS = 0.89.

¹ Extraction Method: Principal Component Analysis. 1 components extracted.

** Correlation is significant at the $p \leq 0.01$ level (2-tailed).

Table 8. Inter-item correlations, Cronbach's alphas, and factor loadings for BCWS.

Items in the scale	2	3	4	5	6	Item-total correlation	Cronbach's alpha if item is deleted	Factor loadings ¹
1. The world economy	.64**	.53**	.31**	.23**	.47**	.59	.78	.75
2. The national economy		.50**	.38**	.31**	.54**	.64	.77	.79
3. Wars throughout the world			.46**	.28**	.60**	.64	.77	.79
4. Crime in community				.41**	.44**	.55	.78	.67
5. Drugs in schools					.32**	.41	.82	.53
6. The political stability in the country						.65	.76	.79

Cronbach's alpha for BCWS = 0.82.

¹ Extraction Method: Principal Component Analysis. 1 components extracted.

** Correlation is significant at the $p \leq 0.01$ level (2-tailed).

Table 9a. Inter-item correlations for GSES.

Items in the scale	2	3	4	5	6	7	8	9	10
1. I always manage to solve difficult problems if I try hard enough.	.35**	.29**	.34**	.33**	.41**	.39**	.37**	.40**	.36**
2. If someone opposes me, I can find means and ways to get what I want.		.36**	.26**	.27**	.28**	.32**	.34**	.32**	.28**
3. It is easy for me to stick to my aims and accomplish my goals.			.37**	.39**	.35**	.38**	.29**	.35**	.33**
4. I am confident that I could deal efficiently with unexpected events.				.46**	.41**	.47**	.34**	.38**	.40**
5. Thanks to my resourcefulness, I know how to handle unforeseen situations.					.43**	.43**	.40**	.50**	.40**
6. I can solve most problems if I invest the necessary effort.						.43**	.44**	.44**	.43**
7. I can remain calm when facing difficulties because I can rely on my coping abilities.							.47**	.50**	.49**
8. When I am confronted with a problem, I can usually find several solutions.								.56**	.43**
9. If I am in a trouble, I can usually think of a solution.									.50**
10. I can usually handle what ever comes to my way.									

* Correlation is significant at the $p \leq 0.05$ level (2-tailed).

** Correlation is significant at the $p \leq 0.01$ level (2-tailed).

Table 9b. Cronbach's alphas and factor loadings for GSES.

Items in the scale	Item-total correlation	Cronbach's alpha if item is deleted	Factor loadings ¹
1. I always manage to solve difficult problems if I try hard enough.	.53	.85	.62
2. If someone opposes me, I can find means and ways to get what I want.	.45	.86	.54
3. It is easy for me to stick to my aims and accomplish my goals.	.51	.86	.60
4. I am confident that I could deal efficiently with unexpected events.	.58	.85	.66
5. Thanks to my resourcefulness, I know how to handle unforeseen situations.	.59	.85	.69
6. I can solve most problems if I invest the necessary effort.	.60	.85	.69
7. I can remain calm when facing difficulties because I can rely on my coping abilities.	.65	.84	.74
8. When I am confronted with a problem, I can usually find several solutions.	.60	.85	.70
9. If I am in a trouble, I can usually think of a solution.	.66	.84	.75
10. I can usually handle what ever comes to my may.	.60	.85	.70

Cronbach's alpha for GSES = 0.86.

¹ Extraction Method: Principal Component Analysis. 1 components extracted.

Table 10a. Inter-item correlations for HS.

Items in the scale	2	3	4	5	6	7	8	9	10	11	12	13	14	15
No. 1	.29**	-.27**	-.07	.13**	.22**	.40**	.08	.27**	.25**	-.17**	.30**	.13**	-.21**	.35**
No. 2		-.29**	.01	.12**	.23**	.16**	.10*	.16**	.31**	-.06	.23**	.11*	-.09	.30**
No. 3			.11*	-.08	-.13**	-.19**	-.16**	-.15**	-.29**	.13**	-.14**	-.01	.20**	-.26**
No. 4				-.11*	-.06	-.08	-.12**	-.14**	.03	.11*	.01	-.11*	.03	-.38
No. 5					.25**	.27**	.19**	.20**	.21**	-.12**	.23**	.25**	-.09*	.17**
No. 6						.32**	.10*	.24**	.31**	-.09*	.29**	.22**	-.13**	.35**
No. 7							.18**	.17**	.27**	-.27**	.18**	.18**	-.18**	.30**
No. 8								.26**	.21**	-.15**	.17**	.16**	-.08	.21**
No. 9									.27**	-.01	.28**	.23**	-.22**	.25**
No. 10										-.19**	.33**	.19**	-.22**	.42**
No. 11											-.09**	-.13**	.18**	-.21**
No. 12												.25**	-.23**	.37**
No. 13													-.15**	.24**
No. 14														-.19**
No. 15														

* Correlation is significant at the $p \leq 0.05$ level (2-tailed).

** Correlation is significant at the $p \leq 0.01$ level (2-tailed).

Table 10b. Cronbach's alphas and factor loadings for HS.

Items in the scale	Item-total correlation	Cronbach's alpha if items is deleted	Factor loadings ¹
1. Most of my life gets spent doing things that are worthwhile.	.32	.48	.56
2. Planning ahead can help avoid most future problems.	.30	.49	.48
3. I don't like to make changes in my everyday schedule.	-.26	.60	-.45
4. Working hard does not matter, since only the bosses profit by it.	-.08	.57	-.16
5. Changes in routine are interesting tome.	.32	.48	.45
6. By working hard you can always achieve your goals.	.42	.45	.56
7. I really look forward to my work.	.33	.48	.57
8. If I'm working on a difficult task, I know when to seek help.	.21	.51	.39
9. Most of the time, people listen carefully to what I say.	.35	.48	.52
10. Try you best at work really pays off in the end.	.41	.46	.64
11. It bothers me when my daily routine gets interrupted.	-.18	.58	-.35
12. Most days, life is really interesting and exciting for me.	.43	.46	.59
13. I enjoy the challenge when I have to do more than one things at a time.	.30	.48	.44
14. I like having a daily schedule that doesn't change very much.	-.24	.59	-.42
15. When I make plans I'm curtain I can make them work.	.45	.46	.68

Cronbach's alpha for HS = 0.54. Cronbach's alpha for HS (excluded item number 3, 4, 11, and 14) = 0.77.

¹ Extraction Method: Principal Component Analysis. 1 components extracted.

Table 11. Correlation matrix for study scales.

	1	2	3	4	5	6	7	8
1. LOS	--	--	--	--	--	--	--	--
2. HADS-A	.37**	--	--	--	--	--	--	--
3. HADS-D	.38**	.39**	--	--	--	--	--	--
4. BSRS	.26**	.14**	.08	--	--	--	--	--
5. PANAS-NA	.33**	.46**	.28**	.19**	--	--	--	--
6. BPWS	.23**	.33**	.28**	.11*	.27**	--	--	--
7. BCWS	-.06	.09*	.08	-.00	.07	.51**	--	--
8. GSES	-.21**	-.05	-.24**	.09*	-.01	-.02	.18**	--
9. HS	-.20**	-.03	-.23**	.06	-.08	.04	.20**	.61**

* Correlation is significant at the $p \leq 0.05$ level (2-tailed).

** Correlation is significant at the $p \leq 0.01$ level (2-tailed).

Table 12. Prevalences, chronic social stress items, comparing women and men.

Bergen Social Relationships Scale items	Women¹	Men
There are people in my life that I care about, but who dislike one another	39.6	39.9
There is a person in my life that needs my help, but I do not know how to help	54.2	53.8
There is an important person in my life that wants to support me, but who often hurts my feeling instead	31.6	30.7
There is a person I have to be around almost daily that often henpecks me	39.2	37.8
There are people that make my life difficult because they expect too much care and support from me	34.7	35.3
There is someone I care about that expect more of me than I can manage	39.9	40.3

¹ No statistically significant gender differences in prevalence were observed.

Table 13. Regression models with loneliness as the predicted variable.

Fit indicators and predictors	Model 1	Model 2	Model 3	Model 4	Model 5
Adjusted R ²	-.00	.11	.23	.24	.24
F	.40	10.24	16.30	16.22	15.08
F change	.40	14.16	26.86	11.93	2.13
Degrees of freedom	523	518	515	514	513
Significant of F change (p<)	.668	.000	.000	.001	.145
Predictors	Standardise Beta Coefficients				
- Age group	-.03	-.02	-.00	.02	.02
- Gender	.02	.02	.04	.04	.04
- Marital status		.04	.04	.02	.01
- Satisfaction with number of good friends		-.26***	-.22***	-.21***	-.21***
- Participation in social activities		-.15***	-.13***	-.12**	-.11**
- Perceived availability of a confidant		-.10*	-.10*	-.07	-.07
- Perceived availability of financial support		-.03	-.05	-.05	-.05
- Chronic social stress			.22***	.24***	.24***
- Personal worries			.27***	.26***	.26***
- Community worries			-.20***	-.17***	-.16***
- Generalised self-efficacy				-.14***	-.10*
- Hardiness					-.07

* Predictors are significant at $p \leq 0.05$.

** Predictors are significant at $p \leq 0.01$.

*** Predictors are significant at $p \leq 0.001$.

Table 14. Regression models with anxiety as the predicted variable.

Fit indicators and predictors	Model 1	Model 2	Model 3	Model 4	Model 5
Adjusted R ²	.01	.02	.13	.13	.13
F	4.20	2.75	9.08	8.28	7.60
F change	4.20	2.15	23.03	.41	.23
Degrees of freedom	523	518	515	514	513
Significant of F change (p<)	.016	.059	.000	.522	.632
Predictors	Standardise Beta Coefficients				
- Age group	.01	.00	-.01	-.00	.00
- Gender	-.13**	-.12**	-.11**	-.11*	-.11*
- Marital status		.01	.01	.01	.00
- Satisfaction with number of good friends		-.11*	-.07	-.07	-.07
- Participation in social activities		-.04	-.02	-.01	-.01
- Perceived availability of a confidant		-.03	-.01	-.01	-.00
- Perceived availability of financial support		.09*	.09*	.09*	.09*
- Chronic social stress			.08*	.09*	.09*
- Personal worries			.36***	.35***	.35**
- Community worries			-.09	-.08	-.08
- Generalised self-efficacy				-.03	-.01
- Hardiness					-.03

* Predictors are significant at $p \leq 0.05$.

** Predictors are significant at $p \leq 0.01$.

*** Predictors are significant at $p \leq 0.001$.

Table 15. Regression models with depression as the predicted variable.

Fit indicators and predictors	Model 1	Model 2	Model 3	Model 4	Model 5
Adjusted R ²	.00	.07	.15	.18	.19
F	1.51	6.44	9.96	11.40	11.05
F change	1.51	8.37	16.79	21.77	5.99
Degrees of freedom	523	518	515	514	513
Significant of F change (p<)	.221	.000	.000	.000	.015
Predictors	Standardise Beta Coefficients				
- Age group	.08	.08	.08*	.11**	.12**
- Gender	.00	-.01	.01	.02	.02
- Marital status		-.01	-.02	-.04	-.05
- Satisfaction with number of good friends		-.11*	-.08	-.06	-.06
- Participation in social activities		-.03	-.01	.01	.02
- Perceived availability of a confidant		-.21***	-.18***	-.15***	-.14***
- Perceived availability of financial support		-.06	-.07	-.06	-.06
- Chronic social stress			.08*	.10*	.10*
- Personal worries			.31***	.29**	.29***
- Community worries			-.14**	-.10*	-.09*
- Generalised self-efficacy				-.20**	-.13**
- Hardiness					-.13**

* Predictors are significant at $p \leq 0.05$.

** Predictors are significant at $p \leq 0.01$.

*** Predictors are significant at $p \leq 0.001$.

Table 16. Regression models with negative affect as the predicted variable.

Fit indicators and predictors	Model 1	Model 2	Model 3	Model 4	Model 5
Adjusted R ²	.00	.03	.12	.13	.13
F	2.18	3.60	8.12	7.40	7.27
F change	2.18	4.15	17.82	.28	5.24
Degrees of freedom	523	518	515	514	513
Significant of F change (p<)	.114	.001	.000	.595	.022
Predictors	Standardise Beta Coefficients				
- Age group	-.07	-.06	-.06	-.06	-.05
- Gender	-.06	-.06	-.05	-.05	-.05
- Marital status		-.03	-.04	-.04	-.05
- Satisfaction with number of good friends		-.13**	-.10*	-.10*	-.10*
- Participation in social activities		-.08	-.06	-.06	-.05
- Perceived availability of a confidant		-.07	-.07	-.07	-.06
- Perceived availability of financial support		.09*	.08	.08	.08
- Chronic social stress			.15***	.14***	.14***
- Personal worries			.28***	.28***	.28***
- Community worries			-.06	-.07	-.06
- Generalised self-efficacy				.02	.09
- Hardiness					-.12*

* Predictors are significant at $p \leq 0.05$.

** Predictors are significant at $p \leq 0.01$.

*** Predictors are significant at $p \leq 0.001$.

Table 17. Regression models with loneliness, anxiety, depression, and negative affect as the predicted variables.

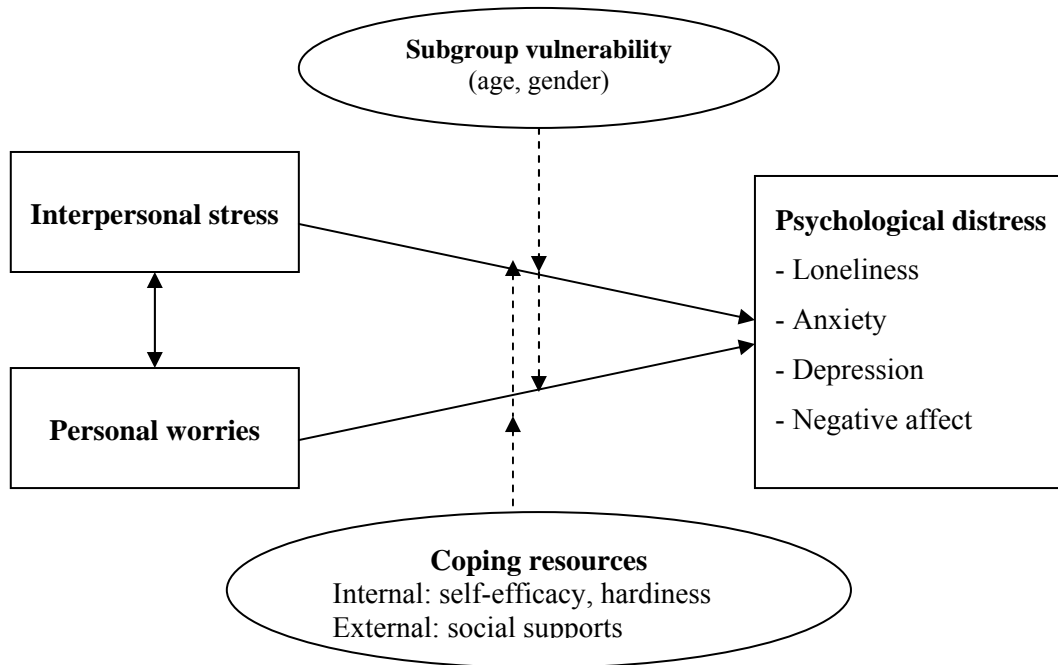
Fit indicators and predictors	Output values			
	LOS	HADS-A	HADS-D	PANAS-NA
Adjusted R ²	.24	.13	.19	.13
F	15.08	7.60	11.05	7.27
F change	2.13	.23	5.99	5.24
Degrees of freedom	513	513	513	513
Significant of F change (p<)	.145	.632	.015	.022
Predictors	Standardise Beta Coefficients			
- Age group	.02	.00	.12**	-.05
- Gender	.04	-.11*	.02	-.05
- Marital status	.01	.00	-.05	-.05
- Satisfaction with number of good friends	-.21***	-.07	-.06	-.10*
- Participation in social activities	-.11**	-.01	.02	-.05
- Perceived availability of a confidant	-.07	-.00	-.14*	-.06
- Perceived availability of financial support	-.05	.09*	-.06	.08
- Chronic social stress	.24***	.09*	.10*	.14**
- Personal worries	.26***	.35**	.29***	.28***
- Community worries	-.16***	-.08	-.09	-.06
- Self-efficacy	-.10*	-.01	-.13**	.09
- Hardiness	-.07	-.03	-.13**	-.12*

* Predictors are significant at p<0.05.

** Predictors are significant at p<0.01.

*** Predictors are significant at p<0.001.

Figure 1. The research model of this study.



Legend
—————▶ Direct and mediating effects
- - - - -▶ Moderating effects

Figure 2. Sample chart.

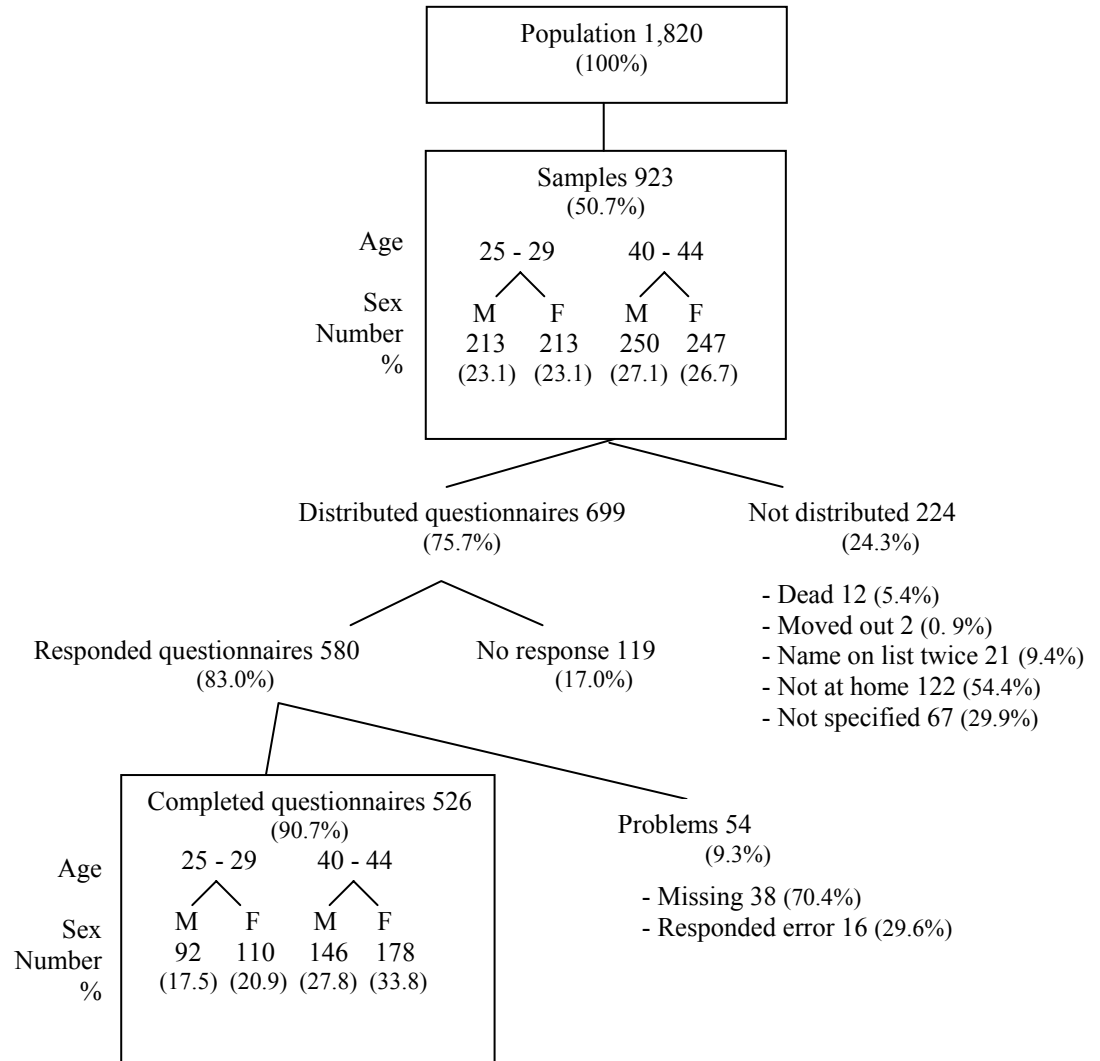


Figure 3. The process of data collection.

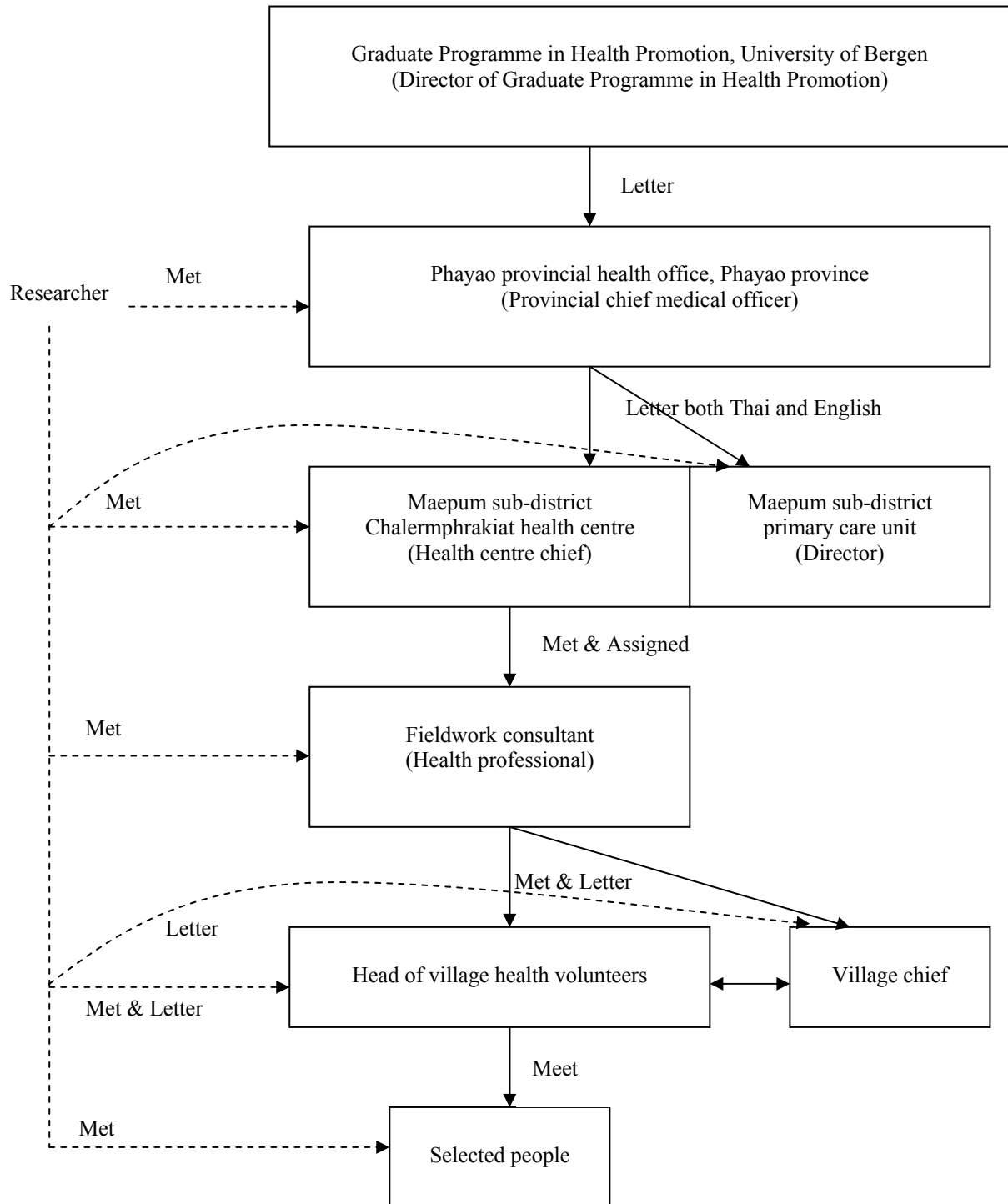
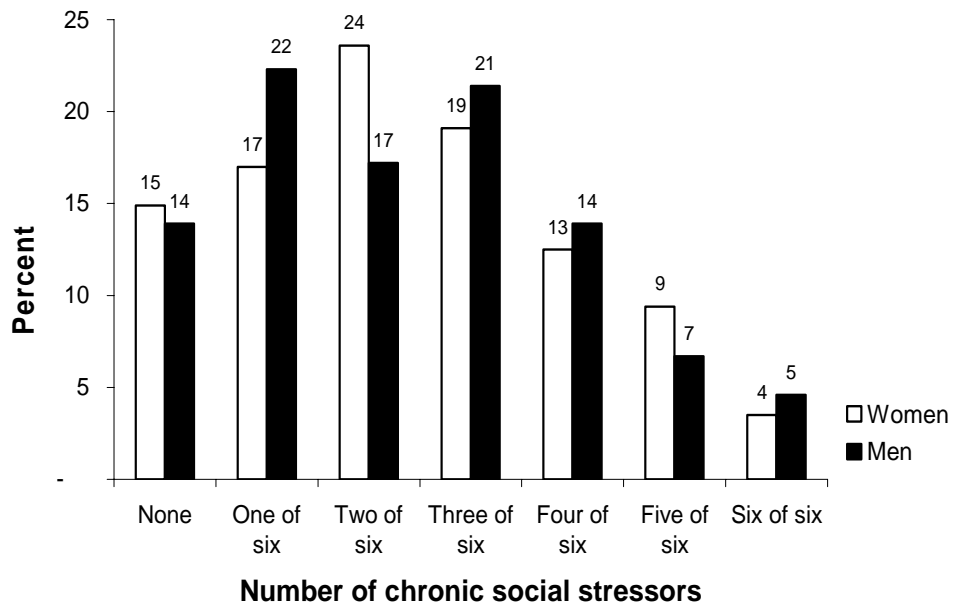


Figure 4. Number of chronic social stressors reported, women and men.



Curriculum Vitae

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Publications and Presentations

◆ *“The Association of Chronic Social Stress with Psychological Distress in Thailand”*. **Charoendee S.**, M.Phil (Health Promotion), University of Bergen, Norway: 2004 (press soon).

◆ *“Positive mental health – a cross cultural comparison”*. **Charoendee S.**, Bancila, Konstantinova, S. and Mittelmark, M. The 4th Students’ Scientific Conference in Bergen, Norway. 13th – 14th May, 2004.

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