Emotional exhaustion and distress after a counselling intervention for physicians.

A three-year prospective longitudinal cohort study.

Karin Isaksson Rø, MD

MODUM BAD
- en kilde til liv

UNIVERSITAS OSLOENSIS · MDCCCXI ·

Research Institute, Modum Bad

Department of Behavioural Sciences in Medicine,
Institute of Basic Medical Sciences, Faculty of Medicine, University of Oslo

Oslo 2010

CONTENTS

Preface:

The psychiatric hospital Modum Bad, in Norway, offers non-mandatory, psychiatric treatment on a nation-wide basis. Through many years, health personnel, including physicians, who needed in-patient treatment, have been referred to this hospital, in order to avoid the local psychiatric hospitals due to confidentiality reasons. As international studies had shown previously, physician-patients at Modum Bad also seemed to come to treatment late in the course of distress and/or dysfunction, when both personal relationships and work ability were threatened. The need for an intervention that was more easily accessible, and that could reach doctors at an earlier stage, to prevent the development of the serious conditions seen at the hospital, was therefore discussed. In addition, a nation-wide survey of health complaints and job stress in Norwegian physicians in the 1990s gave a cause for concern about physician health.Therefore, the Norwegian Medical Association was interested in measures to help physicians in distress.

On this background, Modum Bad and the Norwegian Medical Association, in a joint effort, established a counselling and course centre for physicians in 1998, Villa Sana, which has subsequently been opened also for other groups of health professionals. The declared aims for the centre were to provide an easily accessible, counselling intervention in order to strengthen professional identity, enhance health and life quality and to prevent burnout.

With a professional background in occupational health and subsequently in psychiatry at Modum Bad, I have had the privilege of being a counsellor and course leader for physicians at Villa Sana since 2002.

Summary.

Several studies have shown that there is a relatively high prevalence of burnout and mental distress among working physicians. This is an issue of concern, not only for the individual physician, but also in relation to patient treatment. Both self-perceived and objectively observed associations between physician distress and sub-optimal functioning at work have been reported. In addition, physicians have been found to be reluctant to seek treatment in the traditional health services. Easily accessible and low-threshold interventions to reduce burnout and to prevent serious consequences of distress have therefore been advised.

Few long-term follow-up studies have, however, examined the course of burnout and/or mental distress in physicians after interventions aiming to reduce burnout and associated factors. Such studies are therefore needed, in addition to knowledge about factors predicting or being associated with such course over time. On this background, the three-year course of emotional exhaustion (one dimension in the burnout syndrome) and mental distress in physicians, after a short-term intervention at Villa Sana in Norway, has been investigated in the present thesis. Factors associated with the post-intervention course of emotional exhaustion were examined. This knowledge can contribute to guide the design and implementation of further studies to evaluate the effects of specific intervention programs.

The thesis includes three papers based on a cohort of physicians who sought help at Villa Sana, with assessments before the intervention, immediately after the intervention and at one- and three-year follow-up.

The first paper presents the baseline levels of distress in the Villa Sana cohort, that were found to be high compared with Norwegian physicians in general, indicating that many of the physicians in our sample were in need of treatment.

In the second paper, changes from baseline to one-year follow-up were reported, showing significant reductions in the distress measures. There was a mean reduction in number of work hours/week during the year after the intervention and an increase in proportion of physicians seeking psychotherapy. A substantial reduction in proportion of physicians on sick leave at one-year follow-up, compared with baseline, was found. Reduction of work hours after the intervention was associated with reduction in emotional exhaustion, and among men, satisfaction with the intervention predicted reduction in emotional exhaustion.

The third paper presents the results from the follow-up three years after the intervention. We found that the reduced levels of distress were sustained from one- to three-year follow-up. The results indicate that reduction in emotion-focused coping strategies and reduction in job stress had an impact upon reduction in emotional exhaustion.

The reduction and long-term sustainment of distress levels after a counselling intervention for distressed physicians is promising in relation to the relatively high prevalence of burnout and mental distress found within this profession, and the negative consequences this may have for patient care as well as for the individual physician. Further studies are needed to determine possible causal relationships of factors associated with such improvement and with sustainment of lower distress levels.

List of papers:

Paper I

Karin E Isaksson Rø, Tore Gude and Olaf G Aasland.

Does a self-referral counselling program reach doctors in need of help? A comparison with the general Norwegian doctor workforce.

BMC Public Health 2007: 7;36

Paper II

Karin E Isaksson Rø, Tore Gude, Reidar Tyssen, Olaf G Aasland

Counselling for burnout in Norwegian doctors: one year cohort study.

BMJ 2008: 337; a2004

Paper III.

Karin E Isaksson Rø, Reidar Tyssen, Asle Hoffart, Harold Sexton, Olaf G Aasland, Tore Gude

A three-year cohort study of the relationships between coping, job stress, and burnout after a counselling intervention for help-seeking physicians.

Submitted (BMC Public Health)

Acknowledgements

List of abbreviations and some definitions

MBI – Maslach´s Burnout Inventory

SCL5 – Symptom Check List with five items

HSCL-25 - Hopkins Symptom Check List with 25 items

EPQ – Eysenck´s Personality Questionnaire

DSM-III-R – Diagnostic and Statistical Manual of Mental Disorders, 3rd revised edition

SPSS – Statistical Package for Social Sciences

CI – Confidence interval

SD – Standard deviation

ANOVA – Analysis of variance

ANCOVA – Analysis of covariance

EQS – software program for structural equation modelling

Villa Sana – The Resource Centre for Health personnel, Villa Sana, located in the vicinity of the psychiatric hospital Modum Bad

MD – Medical Doctor

GP - General Practitioner

Physician – in this thesis used as a general word for all doctors. In UK the term physician will usually not include surgical specialists.

Doctor – used in two of the papers as a term equivalent to physician above.

1.0 Introduction

1.1 Burnout and mental distress in physicians.

When burnout was adopted as a term to describe a psychological phenomenon in the helping professions in the 1970s, the metaphor had been used in different contexts before that time. Burning with love - until "love burnt out" - was described by Shakespeare at the end of the 16th century (The Passionate Pilgrim, William Shakespeare, 1599). In a poem from 1920, Edna St. Vincent Millay describes the dual aspects popularly often associated with burnout, both of praise-worthy exertion (usually professional exertion) and of the risks with this exertion.

"My candle burns at both ends; It will not last the night;

But ah, my foes, and oh, my friends-- It gives a lovely light!"

("First Fig" from A Few Figs from Thistles. Poems and sonnets 1922).

Graham Greene used the term in 1960 to describe the psychological equivalent of "cured lepers" (i.e. without active disease but with a maimed body) [1]. At around the same time, burnout was used in the US to describe the effects of chronic drug abuse [2] p 3. A dictionary of English slang expressions at this time defined "to burn oneself out" as "to work too hard and die early"[3].

Burnout was thus an established metaphor when the American psychiatrist, Herbert Freudenberger, adopted the term in relation to the results of prolonged occupational stress in human service workers in 1974 [4]. Freudenberger is considered to be the "father" of the burnout syndrome, and described it as a gradual energy depletion and loss of motivation and commitment, accompanied by mental and physical symptoms in himself and in the other initially dedicated and idealistic volunteers he worked with. At almost the same time, Christina Maslach interviewed health care workers about how people in stressful jobs cope, and described a three-fold reaction to stress including emotional exhaustion, development of negative, cynical attitudes and feelings, and a tendency to evaluate oneself negatively with respect to work. She called this triad of reactions burnout [5]. While burnout primarily was described among health care professionals, research was soon extended to other human service occupational groups, and has subsequently also been used in relation to many other kinds of occupations [6]. Use of the burnout-concept has quickly become popularized, and a recent Google-search revealed 2 884 000 references to "symptoms of, coping with and recovery from burnout" (14.10.09).

The term burnout can, as demonstrated above, point to an irreversible process. To underscore the possibility of reversing the process, other terms have been proposed [7,8], but as burnout still is the prevailing expression, it will be used in this thesis.

There has, during the last years, been a focus on burnout among physicians both internationally and in Norway, investigating the development of burnout and its consequences for the individual physician's well-being [9-17] and for the physicians´ work capacity and thereby patient treatment. Both self-reported and observed relationships between physicians´ symptoms of burnout and suboptimal patient care have been documented [18-21]. Physicians seem to be reluctant to seek help when needed [22-26], and thus continue to work even with high levels of distress. There are indications that the prevalence of burnout can be increasing among physicians [27], and the rapid and recent extensive, organisational changes in the health care systems, both internationally and in Norway, could in different ways contribute to such a development [28-32].

We also have data showing that physicians have a relatively high prevalence of depressive symptoms and suicide [33-35]. Depressive symptoms are also found to have serious consequences both for the individual physician and for increasing the risk of sub-optimal patient treatment [21]. Work-related exhaustion (burnout) and depression are the diagnoses which have increased most during the last decades among employees in the health care providers in Sweden at the end of the 20th and the beginning of the 21st century [8] , and there are similar findings among physicians in Norway (Olaf Aasland at the Research Institute of the Norwegian Medical Association, personal communication). Although burnout and depression are highly correlated, they are not synonymous, and it is therefore important to assess both burnout and depressive symptoms in help-seeking physicians, as has been done in the present study.

Early interventions, to prevent serious consequences of burnout and related measures of distress both for patients and the individual physicians, will therefore be important. The intervention at Villa Sana, referred to in this thesis, offers counselling to help-seeking physicians. As formal clinical treatment lies outside the scope of the intervention, there has not been medical record-taking or diagnosing. It is, however, vital to assess the distress manifestations mentioned above, their prevalence and the relationship between them among physicians, in order to discuss the individual physicians´ needs within and beyond the counselling intervention.

Little previous evidence of the effect over time of interventions, designed to prevent or hinder the further development of burnout and distress, in physicians is available. In this

study we therefore follow the three-year course of burnout and depressive symptoms after an intervention for physicians, examining which factors that are associated with this course. This can give a basis for design and implementation of further studies to evaluate the effects of specific intervention programs.

1.1.1 The burnout concept: definitions and measures.

An often cited definition of burnout builds on the reactions to stress among health care workers described by Christina Maslach, as mentioned above. It defines three dimensions of burnout; emotional exhaustion, development of negative, cynical attitudes and feelings, and a tendency to evaluate oneself negatively that can occur among individuals who do "people work" in human service organizations [5]. Later, definitions of burnout have, in addition, emphasized the process of burning out. A succession of phases, showing different reactions to stress, coming from a discrepancy between the individual's expectations and ideals in contrast to the demands at the workplace, has been described. First the individual perceives emotional strain, after a while changing attitudes towards work and to the people he or she works with. The individual's ways of coping with stress are considered crucial for this process [36]. Thus, the development of burnout is a result of the interaction between the pressure at work and the individual's reactions/coping strategies in relation to this pressure.

In physicians and other professionals with a high motivation for, and engagement in, their work, the professional role can become the most important, or the only, source of self-esteem. When this "performance-based self-esteem", as described by Lennart Hallsten, becomes threatened through a combination of high demands and inadequate coping with the demands, there might be a lack of alternative roles that can maintain sufficient self-esteem or self-definition. This will increase the vulnerability for development of burnout, since coping strategies thus aim to continue mastering the only role where self-esteem is found, in spite of the pressure in that role [17,37].

An attempt at a summarizing definition of burnout has been formulated by Schaufeli and Enzmann: "Burnout is a persistent, negative, work-related state of mind in normal individuals that is primarily characterized by exhaustion, which is accompanied by distress, a sense of reduced effectiveness, decreased motivation and the development of dysfunctional attitudes and behaviours at work. This psychological condition develops gradually but may remain unnoticed for a long time for the individual involved. It results

from a misfit between the intentions the individual has and the reality he or she meets at work. Burnout is often self-perpetuating because of inadequate coping strategies that are associated with the syndrome" [36]. There could be a discrepancy between the notion that burnout occurs in "normal individuals" due to work stress, as defined here, and the notion of a certain individual vulnerability for burnout. A Swedish study has more recently addressed this issue. Civil servants, who were on long-term sick-leave (more than three months) because of burnout or related diagnoses, went through a structural psychiatric diagnostic procedure. A high prevalence of depression was found in this group (80%) as well as vulnerability in relation to previous and present suicidal ideation. There was, however, a lower co-occurrence of personality disorders in the sick-leave sample (less than 20%) than would be expected when comparing to a sample of psychiatric patients with similar levels of depression (50% with personal disorders) [8]. Even though persons with burnout symptoms thus often have a long and successful career behind them, and seemingly have been well-functioning, it is important to pay attention to the co-occurrence both of depression and personal vulnerability with burnout. In the present study we have therefore registered mental distress (mapping both depressive and anxious symptoms) as well as neurotic personality traits and suicidal ideation.

Emotional exhaustion has been emphasized as the primary or the principal dimension of burnout, while originally the sense of reduced effectiveness and dysfunctional attitudes and behaviours at work (depersonalization) were interpreted as consequences of the exhaustion [36]. Later work has questioned this model, and studies by Leiter has found support for a model where exhaustion and depersonalization were found to be related to each other, but not directly with personal accomplishment [36]. These and other studies indicate that burnout is a complex and heterogeneous construct that can manifest itself differently in different individuals [38]. In consequence with this, the estimates of the prevalence of burnout in physician cohorts often refer to the presence of emotional exhaustion, or of emotional exhaustion in combination with depersonalization, instead of using three dimensions. Although all three dimensions are mapped in the present study, emotional exhaustion is viewed as the main dimension, and therefore used to denote level of distress and investigated in relation to change.

Although several instruments to assess professional burnout have been developed, the original and most universally used instrument has been the Maslach Burnout Inventory, MBI, defining the three burnout dimensions discussed above: emotional exhaustion, depersonalization (cynicism) and a sense of reduced personal accomplishment [5]. There is

no cut-off value across the three scales to define burnout [36], which is problematic in relation to estimated prevalence of burnout "case-ness". The developers of the scale defined the third with highest scores, among more than 1100 medical professionals in a normative sample, as burnt-out [39]. Alternative questionnaires have subsequently been constructed, in order to define an over-all cut-off, and/or to modify the questions in relation to different groups of employees (e.g. the Oldenburger Burnout Inventory [40,41], the Copenhagen Burnout Inventory [42] and the Burnout Index [10]), but the MBI is still the most used instrument. Schaufeli and Enzmann found that over 90% of journal articles and dissertations where burnout had been assessed from 1976 to 1996 used the MBI [2] p 71, and this instrument has also been used in the present study.

In most of the international literature on burnout in physicians a seven-point frequency scale has been used to score the MBI, whereas Norwegian physicians have scored the MBI on a five-point scale, used exclusively in Norway. Both these scales will therefore be discussed in the following.

The authors of the MBI originally used two scales to score each item, one intensity scale and one frequency scale. Due to a very high correlation (r>.80) between answers on these two scales, the intensity scale gradually fell out of use [2] p 51. The sum scores for each of the three burnout dimensions measured with the seven-point frequency scale (scored from never - 0 to every day - 6), over which burnout was stipulated in the original study, have been used as cut-off values in later studies, although the authors have cautioned against using these values in relation to the individual. Scores of >=27 on emotional exhaustion and/or >= 10 on depersonalisation have thus been used to define burnout [18].

Using these cut-off values, the point prevalence of burnout in cohorts of working physicians has been found to vary widely. In studies of American residents, prevalence estimates of between 42-77% have been reported [12,13,18,43]. In a more general sample from the US, 58% of physicians reported high levels of emotional exhaustion and 35% high levels of depersonalization [44]. In Europe the prevalence estimates have been somewhat lower. In England and Italy 27-35% had high scores on emotional exhaustion while 19-28% had high scores on depersonalisation [9,45]. An Australian study of anaesthetists found 20% with high levels on the two dimensions [15].

These prevalence figures were found among physicians at work, and Schaufeli has argued that this could be a measure of mild burnout (since work-function was relatively intact), whereas he defined cut-off points for what he called clinical burnout based upon a sample of burnt-out employees receiving psychotherapy [46]. With the use of these clinical

cut-off values, a study of Dutch residents (at work) showed 13% prevalence of burnout and 7% with severe burnout [16]. In a study of more senior doctors 11% among occupational physicians and 8% among general practitioners reported burnout, as compared with 4% in the general population (Bakker A 2000, cited in [36]).

In studies of Norwegian physicians, a five-point scale, measuring to what degree each item described the respondents own experience of the work situation during the last two weeks, was used to score the MBI [17,47]. An arbitrary cut-off was defined as greater than the mean value of 3, on the scale from 1-5, for all three burnout dimensions. Twenty-nine percent of the Norwegian physicians scored above cut-off on emotional exhaustion, whereas between 3-4% scored above cut-off on depersonalisation [17]. The present Norwegian cut-offs thus gave prevalence estimates of high emotional exhaustion that are comparable to the prevalence estimates found in the European studies cited above, while high levels of depersonalisatin were less prevalent than has been found in international studies. It is difficult to know whether this is due to a "strict" cut-off value or to differences in work conditions or in other factors. This way of rating thus complicates comparison of Norwegian physicians with international physician cohorts. In the present study, we have nonetheless chosen the five-point scale to score MBI, as we then had the possibility to compare the results from the Villa Sana cohort with results from the representative samples of Norwegian physicians.

As mentioned above, the majority of prevalence studies of burnout have used a categorical presence or absence of burnout. A dimensional description would present burnout as a continuum of varying degrees of burnout. This is an important distinction also in relation to implementing interventions. Designing interventions to reduce the degree of burnout, as opposed to "curing" an individual from a burnout to a non-burnout stage are two different perspectives. In this study we have mainly used the dimensional measure, with the dichotomous measure for emotional exhaustion as a supplement, also on a background of our understanding of burnout as a continuum rather than either having burnout or not having burnout.

As shown, comparison of burnout prevalence across different physician cohorts yield varying results, but in total the studies indicate that burnout among physicians at work is an important issue. An English study indicates that burnout levels among physicians could be increasing (from 1993 to 2002), which further emphasizes the importance of addressing risk factors for burnout [27]. With the rising numbers of women physicians in many countries, it is also important to note a study from the US indicating that women physicians have 1.6

times the odds of male physicians for reporting burnout [48]. We do not know how this is among physicians with a Scandinavian culture, like in Norway.

As indicated above, the relationship between burnout and depressive symptoms needs to be addressed in relation to the present study, and will be discussed in the following.

1.1.2 Depressive symptoms and burnout

Co-occurrence between burnout and depressive symptoms is found. Partly this reflects a shared variance between depressive symptoms and especially one of the burnout dimensions - emotional exhaustion. In a review of 12 studies, emotional exhaustion had an average of 26% shared variance with depression, while depersonalisation shared 13% and personal accomplishment 9% [36]. Although the two concepts share an appreciable amount of variance, a review including eighteen burnout studies, by Glass and McKnight [49], found that the concepts are not redundant but describe different concepts. Originally burnout was contextually related mainly to the work situation, in contrast to depressive symptoms which are not defined as related to a specific context [6,36]. It has been described that burnout in more advanced stages can be generalized to private domains of life, and depressive symptoms have been found to be an outcome of burnout [50]. Depressive symptoms, on the other hand, could also lead indirectly to an increased risk for development of burnout. Even though the depressive symptoms can be causally unrelated to the working situation, they can influence the individual doctor's well-being, and thereby work functioning [21,51], and the experience of making mistakes or functioning sub-optimally at work can, in turn, increase the risk for development of burnout [19].

Studies on the prevalence of depressive symptoms among physicians show less variation between countries than the studies on burnout. Around 30% of physicians in their first post-graduate year have reported depressive symptoms, as demonstrated in a review of studies from two decades by Firth-Cozens [33]. Prevalence seems to fall with years at work, but in several studies, physicians later in their career still have higher prevalence rates than community norms, studies showing 18-27% prevalence in different groups of specialists [33,34]. These results correspond with results from a survey of employees in the National Health Service in England in 1997, where 28% of the physicians had minor psychiatric disease, compared with 18% in the general population [52].

In a representative sample of Norwegian physicians, 11% were found to have a present severe depression, as diagnosed by Goldberg's General Health Questionnaire [53].

A rough comparison with a Norwegian population sample indicates that the prevalence is relatively higher in physicians. The one-year prevalence of major depression, diagnosed by the Diagnostic and Statistical Manual of Mental disorders, DSM-III-R, found the population prevalence to vary between 7.3% in an urban area, and 3.3% in a more rural area [54].

Depression is a known risk factor for suicidal ideation and for suicide, and suicide rates are elevated among physicians both in international and in Norwegian surveys. In 2004, a meta-analysis of international studies showed a modestly higher relative rate of suicide among male physicians 1.41 (95% CI 1.21-1.65) compared with the general population and a higher relative rate among women physicians 2.27 (95% CI 1.90-2.73) [35]. In Norway the suicide rates, from 1990-2000, were 34.3 per 100 000 person-years for male physicians compared with 24.9 for all men and 16.1/100 000 among women physicians compared with 8.6/ 100 000 for women in general [55].

Both depression and burnout, as independent risk factors, have recently been found to predict suicidal ideation among medical students [56], and depression predicts aggravation in suicidal ideation among Norwegian physicians [57].

As found with burnout, women physicians have, in some studies, shown higher rates of depressive symptoms than male physicians. Hsu and Marshall [58] found that women physicians in the US were 1.5 times more likely to be depressed than male physicians, Firth-Cozens found significantly higher levels of depression among UK women junior house officers than among their male counterparts [59], and there was a higher prevalence of women than male physicians with "severe depression" in a representative sample of Norwegian physicians [53]. In the English study of National Health Service workers, 36% of women physicians, compared with 24% among male physicians had minor psychiatric disease. While most studies show rates of depression to decrease with time in career, an increasing level of minor psychiatric distress with age was found among women physicians in this English study [52].

Assessment of depressive symptoms, in addition to burnout, in physicians seeking help, is thus important in relation to individual suffering, risk for suicide as well as in relation to work performance, and has been done in the present study. Depression is, for these reasons, important to treat, and it is thus important to overcome physicians´ reluctance to seek treatment [33]. In view of an increasing percentage of women in medicine, these issues could be even more important in relation to future counselling and treatment of physicians, since women physicians seem to have relatively higher prevalence than men both of burnout and depression. Depressive symptoms and symptoms of anxiety, together

called "mental distress" have in this study been measured with a five-item version of the Symptom Check list, in order to be able to compare the levels of mental distress with Norwegian physicians in general [60,61].

1.2. Factors associated with burnout.

Previous studies have mainly studied factors associated with burnout and mental distress in physicians in cross-sectional designs, while few prospective and longitudinal designs to study predictors for the development of such conditions have been performed. As there is a lack of studies on how different factors can contribute to reduction of burnout and mental distress in distressed physicians, intervention programs so far have largely built on knowledge of factors associated with, or predictors for, development of such conditions. In the present study, some of these factors will be examined in relation to their possible associations with the course of burnout after a counselling intervention. The potential knowledge emerging from this longitudinal investigation can define important elements in future interventions for physicians that should be evaluated in studies with a controlled design.

Work load has been found to be associated with perceived work stress, which is important for mental health status. As outlined above, the perception of work stress and its importance for mental distress or mental well-being is influenced by individual factors (e.g. personality and ways of coping). Organizational factors also seem to influence perceived work stress and mental health status (e.g. role understanding, social support, autonomy) [2,62,63]. In the present study some of these factors have been measured, and these will be discussed in the following, concentrating on studies of physician samples that are most comparable to the present study.

1.2.1 Perceived job stress and work load.

Perceived job stress has often been described by defining different dimensions of stress. Cooper identified six different job stress dimensions among British general practitioners [64], and four of these predicted mental ill health in both male and female practitioners. Job stress interfering with family life was the most important among the four in relation to ill health for women practitioners. For male practitioners, stress due to interruptions at work or at home, practice administration, and demands from the job and the

patients were the most important factors associated with ill health [64]. A translated and modified version of Cooper's job stress questionnaire has been used among Norwegian physicians. Psychometric testing have yielded three stress dimensions in one and four dimensions in another study, including stress from emotional pressure/demands from patients, interruptions/time pressure, stress relating to interference with social life and stress due to fear of complaints/criticism (fear of litigation) [29,65]. Job stress was found to be associated with "perceived mental health problems in need of treatment" in young physicians, and especially to emotional pressure and demands from patients [29].

Job stress has also been examined as a predictor for burnout, and cross-sectional associations between them have been found, in particular in relation to work-home interface stress [66,67]. Longitudinally, a reciprocal relationship between job stress and emotional exhaustion was found in an English physician cohort [68], while a similar reciprocal relationship was found between stress due to work-home interface and emotional exhaustion in a Norwegian, longitudinal study of several professions, including physicians [69].

Stress in relation to work-home interface is the stress dimension that seems to increase over time during the first ten post-graduate years in a Norwegian physician cohort [65]. As there are indications that women may be especially vulnerable for this type of job stress, and considering the increase in number of women physicians that we are experiencing, the importance of this dimension needs to be examined, for both genders, in relation to reduction in burnout. To the interventions at Villa Sana, the physicians have the possibility to bring their spouse or partner, which provides an arena for discussing measures in relation to work-home interface stress. Work-home interface stress can be related to specific issues for one family or couple (best discussed in counselling sessions with one couple at a time), but also to general themes that can be brought up in the intervention groups for couples.

Number of work hours/week is one way of measuring work load. Studies have mostly not found any direct association between number of work hours and burnout among physicians [51,67], while others have shown such associations [43,70]. One of these studies indicates a dose-response relationship between number of work hours and level of emotional exhaustion [43]. A reduction in number of work hours/week has, however, been associated with reduction in emotional exhaustion among US residents after the implementation of work hour regulations in 2003 [12,13,43,71], indicating that in studies examining predictors for reduction of burnout, number of work hours/week could be an important factor to assess.

Changes in work load, in the form of work hours/week, and changes in total job stress, as well as in different dimensions of job stress, were thus examined in relation to course of emotional exhaustion after the counselling intervention in this study.

1.2.2 Personality traits

The personality traits most consistently found to be associated with high levels of emotional exhaustion are those describing neuroticism [2] p75. In a cross-sectional study of physicians, neuroticism was found to have 31% shared variance with emotional exhaustion [72], also predicting emotional exhaustion in physicians in long-term prospective studies [73,74].

To determine the independent effect of factors associated with burnout, which could be important to target in an intervention program, it is therefore important to control for this trait in multivariate predictor models of reduction in burnout. Including neuroticism in the equations also controls for the tendency to be self-critical in self-reporting questionnaires [75].

In this study neuroticism and extro- introversion have been assessed using an abbreviated form of the Eysenck´s Personality Questionnaire [76].

1.2.3 Coping strategies

Coping strategies have been interpreted both as a trait – stable across situations and time – and as a state; meaning a situation specific response [36]. A definition of the concept has been given as ways used by a person to reduce the possible harm of an event that is considered potentially dangerous to the person's psychological well-being [77]. They are usually grouped into (1) active, problem-focused and (2) emotion-focused ways of coping. The former are primarily ways of coping with the stress-full situation by procuring social support or dealing directly with the problematic situation. The latter are ways of coping with the emotions that arise in a situation by taking the blame, engaging in wish-full thinking or by avoiding the difficult feelings and situations in different ways.

A couple of studies have indicated that stress might increase use of active coping strategies. Physicians who had been through malpractice litigations reported more use of active coping strategies than those who had not [78], and a qualitative study found a relationship between experiences of racism and coping by kinship in African-American family physicians [79]. It is, however, primarily the emotion-focused ways of coping that

have been found to relate to mental health. Wishful thinking has been found to be associated with depression in medical students [80], to predict need of mental health treatment in young physicians [81], and to be associated with post traumatic stress disorder among Israeli physicians [82]. The association between emotion-focused coping and burnout, has in some studies of physician cohorts, been found to go via job stress [72,83].

A longitudinal study among Australian general practitioners found changes in both distress and coping strategies after the implementation of a cognitive behavioural training program. [84]. The reduction in general psychological distress was related to an increase in problem-focused coping strategies and a decrease in emotion-focused coping strategies. Improvement was found from baseline to post-intervention and continued improvement was measured at twelve weeks follow-up. The study indicates that the role of coping styles can be a possible mediator between the described intervention and improved stress outcomes. The intervention, however, seemed to have a weaker effect upon coping styles than upon the stress outcomes.

These studies indicate that coping strategies are important for stress management among physicians, and that coping strategies can be influenced by interventions. Focusing on coping strategies could thus be a practical and beneficial strategy in interventions for burnout among physicians. We have therefore measured levels of coping strategies and investigated how change in coping strategies are related to the course of emotional exhaustion in initially distressed physicians. We have also examined whether coping strategies could be modified during and after a counselling intervention, and expected an increase in active coping on the expense of emotion-focused strategies.

1.2.4 Organisational factors

Organisational factors at work will influence the individual physician's role perception. Both perceived autonomy and perceived control over the working situation, which have been found to influence physician well-being can overlap with the perception of role. Increasing demands at work, with less influence due to financial constraints and managed care, in combination with the rapid development of information technology, challenge and change the physician role [30,31]. The frequent organizational changes in the health care systems have been found to increase role uncertainty by increasing the number of conflicting demands and creating role conflicts as well as role overload [85]. A Swedish study, consequently, points to the importance of organizational structure to prevent burnout

[31]. Intra-role conflicts have also been discussed in relation to junior physicians who perform the roles both of a physician and of a trainee, with an inherent tension between the two [86].

Lack of clarity in role understanding or role definition, due to different reasons, can thus result in role ambiguity and role conflicts intra- as well as inter-professionally [28]. One study shows that this can increase the risk for development of all three burnout dimensions [85], while another study has found that role conflict mediates the relationship between job demands and burnout [86]. Reductions in role conflict and role ambiguity have been reported to lead to decrease in emotional exhaustion [85].

These studies emphasize the importance of focusing on role clarity as part of the working conditions, especially in relation to young physicians. This should primarily be done at the work place where these organisational issues need to be addressed. But it is also important to address the issue of role perception in a counselling relation with the individual physician. Such reasons for seeking help have therefore been mapped in the present study.

1.3 Burnout and mental distress in relation to consequences for work performance.

One of the major reasons for the interest and research on the occurrence of burnout in physicians is the relationship between experienced distress and consequences for work, both in relation to possible sub-optimal work performance and to absenteeism, with the risk this constitutes for patient treatment.

The majority of studies on relationships between doctors´ health and patient care are based on self-reported data. In an English study of 225 physicians from hospitals and general practice, 36% reported recent negative outcomes as less care, irritability or anger from the physician towards the patients, as well as some serious mistakes, that in a few cases were fatal, due to the physicians´ own fatigue, over-work, depressive or anxious symptoms and alcohol use [20]. More than 90% of physicians in a sample from a university hospital in London reported that distress had influenced their work, leading the physician to experience more irritability, more concentration problems and a reduction in work capacity. Half of the physicians also noted that their personal life was influenced by creating problems with their spouse and increasing social isolation and personal disorganization [87]. Medical interns, with high levels of the burnout dimension depersonalization (cynicism),

reported more sub-optimal patient care [18], while another study found an association between burn-out and self-perceived medical errors among residents [19].

It has been discussed whether stressed/burnt-out physicians are more self-critical and therefore report more mistakes or more sub-optimal care than physicians who are not stressed [88]. If so, this could lead to a false association between physician distress and sub-optimal performance, and some studies have indicated that this might be the case. A study of residents in paediatric departments found objectively higher rates of medication errors among depressed than non-depressed residents. There were no differences in rates of observed medication errors between the burnt-out and non-burnt-out groups of US-residents, but the burnt-out group self-reported more medical errors [21]. In accordance with this, another study also found a low rate of agreement between self-assessment and observational data regarding practical, easily observable mistakes made by physicians. This study, however, found that physicians who made mistakes did not acknowledge these themselves [89]. These two latter studies focused on practical, easily measured outcomes, whereas psycho-social interactions between physicians and patients were not addressed, most obviously because they are more complex to evaluate objectively.

Not only has distress (burnout and depression) been found to predict perceived and observed errors at work, but perceived medical errors have also been found to predict distress, thus creating a vicious circle [19,21]. Studies are needed to further examine these relationships.

Burnout has been found to be associated with sickness-absence in cross-sectional studies and change in burnout has predicted corresponding changes in absence in Danish human service workers [90]. The relationship between work-related sick leave and burnout seems to differ between different occupational groups, and a Norwegian study found that changes in burnout could explain a substantial part of changes in work-related sickness absence in physicians [91].

Studies thus point to a relationship between distress in working physicians and a negative impact on patient treatment, as well as on absenteeism. In addition to the relief needed for the individual physician, this emphasizes the importance of helping physicians who experience distress in order to secure optimal patient care. The present study does not investigate physician performance directly in relation to patients, but this aspect was an important reason for establishing Villa Sana, and indirectly the counselling interventions aim also to secure patient treatment, by enhancing physician well-being. Further we do look

at working hours per week and sick leave following the interventions among distressed physicians, which can give indications about the work situation.

1.4 Help-seeking.

The higher prevalence of mental distress in physicians than in comparable groups, and the impact that mental distress has on patient treatment, ought to prompt early help-seeking in this group.

On the contrary, studies indicate that physicians seek help to a lesser degree, and later in the course of de-compensation/distress than do other groups. The term "hazardous heroes" has been used about Norwegian physicians going to work with symptoms and problems for which they would have given their patients sick-leave [22]. Similarly, in a qualitative study among British physicians, the respondents reported working in spite of being sick, as well as expecting their colleagues to do so. They would, however, not expect the same from their patients [24]. Finnish physicians have in one study been found to have a lower rate of sick leave (a third to half of the prevalence) compared with other groups of health care workers, even though the prevalence of disease did not differ [25].

In a randomized survey of Australian physicians, a majority reported that they would feel more embarrassed in seeking help for psychological than for physical problems, and 87% reported that they would be reluctant to seek help for psychiatric problems [26]. Among hospital doctors in an English survey, 68% (141) of the participants reported previous or current emotional distress of moderate or severe degree. Only 9% reported absence from work due to their distress, although 94% of these doctors meant that their emotional distress had affected their work function. Within this sample as many as 75% did not seek professional help [87].

In consequence with this, US studies have reported that physicians come to treatment late in the course of distress; many have been prompted by third parties such as colleagues, insurance companies, police, and review boards indicating that job performance already was impaired [92-94]. The prevalence of self-reported mental health problems in need of treatment among young Norwegian physicians in the fourth post-graduate year was 17%. Of these, 58% had not sought help, a substantial increase from 25% not seeking help as students [95]. Lack of treatment for depression was also observed among US residents taking part in a study of medication errors [21]. A literature review on the health problems and use of health services among physicians confirms this reluctance to seek help [51].

Also when investigating the intention to seek help, three out of four English hospital physicians stated that they would not seek professional help for disease, because they doubted the necessity and whether it would help [87].

Reasons for lack of help-seeking have been sought, and the culture of the medical profession seems to deter physicians from self-care. General practitioners in Britain reported that they felt a need to present a healthy image of themselves both to patients and colleagues because they believed that their health could be interpreted as an indicator of their medical competence [24]. This view promoted an embarrassment to even discuss ill-health with colleagues. Taking sick leave was, in addition, difficult because of practical reasons and a feeling of responsibility towards patients and colleagues [96]. Physicians thus do not easily adapt to the patient role and they also have problems in being professional when treating a colleague [97,98]. Especially regarding mental health problems, physicians tend to be passive, embarrassed to seek help and, in addition, worried about lack of confidentiality [24,26].

In different places, treatment programs have, with some success, tried to lower the threshold for seeking treatment. In Spain, physicians can use pseudonyms when admitted to a special hospital [99,100] in an effort to enhance confidentiality. In Norway, physicians can be referred to a centralized national hospital in order to avoid the local environment where confidentiality could be more difficult to ensure [101]. In the United States complete confidentiality, easy access and offices not identifiable with psychiatry have been established in order to facilitate help-seeking among physicians [102,103].

Overcoming physicians´ reluctance to seek help when needed has been difficult, as indicated above. An important issue in this study was, therefore, to investigate whether physicians in need would seek help at Villa Sana, and to characterize factors that might contribute to lowering the threshold for help-seeking. We also wanted to study reasons for seeking help, in relation to the aims for the interventions, and whether physicians came on their own initiative or if they needed prompting also to this counselling intervention. An important question we raised was whether the course of distress would differ after the intervention according to the way they entered the intervention program, i.e. being prompted or by own initiative.

1.5 Preventive interventions for physicians.

1.5.1 Definition of preventive interventions in relation to programs at Villa Sana.

Prevention is a multi-faceted concept describing processes aiming to hinder or limit an unwanted development. The definition can vary according to tradition or background, from the disease-preventive perspective to a health promoting perspective, with implementation of measures that promote life quality and coping [104].

In a psychiatric perspective, prevention was split up into primary, secondary and tertiary forms as described by Caplan [105]. This classification was based on in which phase of the problem-developing process the measures were implemented, and in relation to how target groups and problems were identified. Primary prevention is, according to this definition, general measures implemented before a problem arises, in order to avoid it, in populations that do not have a specific risk profile. Secondary prevention is defined as measures that should prevent persistence or an aggravation of an already existing problematic situation. It is thus aimed at identified risk groups or individuals. Measures of tertiary prevention should counteract aggravation of the problem/symptoms and limit negative consequences of the problem in defined populations or individuals. Tertiary prevention is therefore closely related to treatment and rehabilitation. Prevention of re-occurrence of burnout and mental distress after a remission is also one aspect of tertiary prevention. In practice the distinction between especially the levels of secondary and tertiary prevention are not clear.

Later, another classification has been introduced, defining interventions as universal, selective or indicated [106]. The universal preventive initiatives are related to a whole population or to all the members of a group. The selective preventive measures are for the subgroup of a population that has an above average risk for becoming ill, whereas the indicated measures are for persons manifesting a risk factor. A given example of indicated prevention is medication for high blood pressure. Applying these principles to mental health can be complicated, as in clinical practice the boundary between prevention and treatment is not as clear-cut as this classification system conveys, where indicated preventive interventions often are referred to by clinicians as early interventions or an early form of treatment.

In some settings there has been a simplistic blending of these two classification systems.

Explicit reasons for establishing the Resource centre for health personnel, Villa Sana, was to prevent the development of burnout, but also to hinder the serious conditions and consequences of mental disease that had been seen in physicians who throughout the years had been admitted to the psychiatric hospital, Modum Bad [101]. This was meant to be obtained by establishing an easily accessible and low-threshold intervention for physicians who felt a need for help with their problems, but hesitated to seek the ordinary health services. Applying the definitions above, the Villa Sana interventions could be described as secondary, tertiary or indicated preventive interventions, with an overlap to early treatment interventions.

Interventions can be implemented on an individual, group-oriented and/or organizational level [107], and such interventions have to a very small degree been evaluated in groups of physicians. For instance there are no long-term follow-up studies of low-threshold interventions such as Villa Sana.

1.5.2 Studies of interventions for burnout and distress among physicians.

Most of the preventive interventions implemented in relation to physicians, have involved medical students or interns/residents/junior house officers, while there are very few interventions for more experienced physicians. In table 1, some intervention studies for physicians, that have used one or more dimensions of burnout or other distress measures as outcome variables, are presented.

Concerning young doctors, several of the primary preventive interventions have not measured distress variables. Reduction in emotional exhaustion was found in two of the studies included in a recent review of interventions to prevent resident physician burnout covering the years 1966 to 2007 [108]. One of these was an intervention with work-shop seminars [109]. Although not referring to ordinary intervention measures, several studies have examined distress before and after the Accreditation council for Graduate Medical Education (ACGME) in the United States implemented work hour restrictions for residents to 80 hrs a week in 2003. This can be seen as an organizational intervention. Both prospective longitudinal studies [12,71] and a comparison of cross-sectional surveys performed before and after the intervention [13] found reduced rates of emotional exhaustion among residents six months to a year later [12,13,71]. One of the studies with a

survey before and two years after the intervention found only near-significant reduction in emotional exhaustion [70], which could imply that the effects were reduced with time.

In relation to more experienced physicians, a couple of educational programs have studied health-related outcomes [110,111]. These were not designed to target burnout or distress specifically and exhaustion was either not influenced or increased. Interventions should, therefore, be more specifically designed to target distress, and reduction in burnout should be an expected outcome after such a program.

Other interventions have showed improvements in distress. In an Australian randomized study, general practitioners with psychological distress who received a mailed educational intervention (controlled for other educational programs they participated in) had significantly lower levels of psychological distress at three-months follow-up, compared with the control group [112]. As in the present study, the participants were relatively distressed at baseline. Other interventions for general practitioners have also shown reduction in burnout. Mindfulness training groups for primary care physicians gave reduction in burnout as measured after an intensive teaching phase followed by a maintenance phase over ten months [113]. Improvement in levels of emotional exhaustion was found up to twelve weeks after a course with cognitive-behavioural training for stress management among general practitioners [84]. Longer-term follow-up after these individual interventions are lacking among physician groups. Only one study of an intervention for health care providers, including physicians, had a two-year follow-up. It showed a reduction of emotional exhaustion in the groups that had received an educational program on coping techniques, compared with the control group, six months after the intervention. In further follow-up, there was a relapse in the intervention group that had only received the teaching intervention, while another group, with refresher sessions of teaching during the two-year follow-up, showed a continued improvement in emotional exhaustion [114]. Longer term evaluation of the course after interventions is thus needed, in combination with a study of factors that could sustain positive change, as in the present study.

While there has been a focus on individually oriented interventions for burnout, the interfaces between the individual and the working place [115], as well as between the individual's work and home situations are important to focus [65,68].

Work-related interventions have, generally, been implemented in organisational units where physicians are one of several groups of health care workers. As exemplified by an intervention at a Swedish hospital, where structured repeated assessment and feed-back was implemented through several years, results can be difficult to interpret since effects

vary between groups, and many factors influence the process [31]. A couple of interventions have combined an organisational and an individual approach towards physicians. In a Swedish paediatric hospital, physicians reported improvement in both organizational and staff well-being after participation in dialogue groups over a year [116]. At a clinic in the US physician emotional exhaustion decreased over a five-year period where well-being for physicians was focused and both individual and group interventions were implemented on the basis of regular surveys of physician satisfaction and distress [117].

Organisational aspects should primarily be dealt with in the individual work places. Certain perspectives on such work conditions for physicians can also, however, be discussed across different work places, as is done in the Villa Sana group intervention program.

In more systematic reviews of intervention programs for occupational stress and burnout among health care workers, intervention studies in relation to physicians have not been included. The Cochrane meta-analysis from 2006 of interventions for preventing occupational stress in health care workers had burnout (MBI) as one of the primary outcome measures [107]. A more recent review of programs for reduction of burnout [118] included several interventions for health care workers. The absence of physician-specific interventions in these reviews indicates that there is a need for more stringent designs of such interventions among physicians, in order to conclude scientifically on the relationships between intervention and possible short- and longer-term effects. The present study can contribute towards identifying factors associated with long-term course of burnout after an intervention in distressed physicians, and thus lay the premises for a later stringent controlled design.

Studies have shown that general practitioners could have increased incidence of burnout [9-11], and some of the intervention schemes have consequently been designed for this group, as mentioned above, and shown in Table 1. With an intervention open for physicians from all specialties, we had the opportunity to investigate whether certain specialties were over-represented in relation to the distribution among specialties in Norway in general. Such over-representation could indicate need for specialty-specific focus in relation to interventions.

Table 1. Studies of interventions for physicians, where burnout or related distress measures were outcome variables.

Authors	Participants	Study design	Type of intervention	Time to follow-up	Results
McCue et al 1991 [109]	Internal medicine, paediatric and int.med/paed residents	Non-randomized controlled trial	Stress management workshop	6 weeks	Significant reduction of emotional exhaustion and less deterioration of depersonalisation compared with control group.
Margalit et al 2005 [110]	General practitioners	Randomized controlled intervention.	Two groups with educational programs on promoting a biopsychosocial orientation in family med. One group more lectures, other group interactive discussions. Group meetings 4-6 hours/week for 12 weeks.	6 months	Modified measure of burnout (Kushnir et al 1992) significantly increased in both groups
Jansson von Vultée et al 2004 [111]	Female physicians	Prospective, controlled study.	Could follow one of three different management programs during a year (sessions every to every four weeks), and they were compared to a reference group	1 year	No differences in "work-related exhaustion" as defined by questions in the "Quality competence tool" between groups or compared to reference group.
Holt et al 2006 [112]	General practitioners	Randomized controlled study.	Physicians w psychological distress, according to mailed survey, randomized to a written feed-back on the score, a self-help sheet and invitation to join an educational program.	3 months	Controlled for other educational programs, the intervention group had more reduction in general psychological distress measured by the General Health Questionnaire (GHQ) than the control group.

Krasner et al 2009 [113]	Primary care physicians	Longitudinal study.	CME (Continuing Medical Education) course with mindfulness meditation and other group interventions for 8 weeks intensively (2,5 hours/week) and 10 months maintenance phase (2,5 hours/month)	3 months after end of program	Reduction in emotional exhaustion, depersonalisation and increase in personal accomplishment
Gardiner et al 2004 [84]	General practitioners	Prospective controlled study	Participants elected to attend a 15 hour (over 5 weeks) cognitive behavioural stress management course. Control group attended other education	12 weeks	More reduction in general psychological distress, measured by General Health Questionnaire (GHQ) in the intervention group than the control group at end of intervention. Maintained levels at 12 week follow-up in intervention group.
Rowe et al 1999 [114]	Health care workers including physicians	Randomized controlled trial.	One group got 6 weeks teaching of coping techniques, one group 6 weeks teaching plus refresher-sessions at 5, 11 and 17 mths and one control group	2 yrs	After 6 mths improvement in emotional exhaustion and personal accomplishment in both intervention groups. Continued improvement for group with refresher sessions but relapse for group with one intervention.
Bergman et al 2007 [116]	Paediatricians and residents in paediatrics	Pre and post measurement after a combined organisational and individual intervention.	Dialogue groups for physicians 3 hrs/month ten times a year. Residents had the possibility to participate for two years and specialists for one year	At end of inter-vention	For specialist doctors working with inpatients improvement of work-related exhaustion from before to after the intervention, and a near-significant improvement for all physicians at the clinic.

Dunn et al 2007 [117]	Specialists in Internal medicine and family medicine	Prospective, longitudinal study with organisational and individual intervention	Regular survey of physician satisfaction, burnout and quality work competence through five years. Results reported to individual physician and organisation (anonymised). Data-guided interventions to enhance physician and organisational well-being.	Five years follow-up (while the surveys were con-ducted)	Emotional exhaustion decreased over the study period.

1.6 Present status and need for further knowledge.

Burnout is a work-related concept describing emotional exhaustion, depersonalisation and reduced personal accomplishment that can occur as reactions to stress due to a discrepancy between the individual's expectations and ideals in contrast to the demands at the workplace. The Maslach Burnout Inventory has predominantly been used to measure burnout, and although prevalence estimates in physician cohorts vary widely, burnout seems to be an important issue in relation to physicians´ mental health. Depression is a closely related distress measure, with a higher prevalence in physician groups than in comparable groups. Both burnout and depression can have consequences for the individual physician as well as for his or her professional performance, and thereby for the quality of patient treatment.

Physicians as a group are reluctant to seek help, especially for mental distress, and they seem to come to treatment late in the course of distress and/or dysfunction, when both personal relationships and work ability could be threatened. We therefore need studies on the effects of low-threshold intervention measures.

A few studies on interventions have shown reduction in burnout and in depressive symptoms, but follow-up periods have been short, and results indicate that symptoms could relapse over time. Hence, there is a need for studies of the long-term course of distress after interventions for distressed physicians.

Workload and perceived stress in interaction with both individual and organisational factors have been associated with or predicted burnout and mental distress in physicians.

We do, however, lack studies on which factors that are associated with and predict reduction in burnout, and factors that can sustain an improvement in distress over time.

The studies of interventions for physicians have generally lacked a design that has allowed investigations of causal relationships between interventions (including specific elements in the interventions) and outcome. In order to design interventions to study causal relationships, we need more information about the long-term course of distress after a counselling intervention, and we need to have identified possible predictors for the course of distress.

On this background, we have performed a three-year, prospective, longitudinal follow-up cohort study of physicians, who had taken part in the counselling intervention programs at the Resource Centre for Health Personnel, Villa Sana in Norway. Physicians could come to this counselling, non-treatment intervention on a self-referral basis, attending a one-day intervention, or a group intervention with a program over five days. The representativity of the sample was assessed by comparing the cohort with representative groups of Norwegian physicians. The following research questions were investigated:

2.0 Research questions

1. What characterizes physicians who sought help at a counselling intervention, Villa Sana, in comparison with representative samples of Norwegian physicians, and what reasons did they give for seeking help? (Paper I)

2. What was the course of burnout and mental distress from baseline to one- and three-year follow-up after a counselling intervention for physicians? How did levels of job stress, neuroticism, being in treatment (with a general practitioner, with a psychotherapist, or with anti-depressants), sick leave, and number of work hours change over the same periods (Paper II, III)

3. Which predictors were found to be associated with change in emotional exhaustion from baseline to one-year follow-up? (Paper II)

4. How did levels of neuroticism, job stress and ways of coping influence change in emotional exhaustion from baseline to three-year follow-up among physicians? (Paper III)

5. Was psychotherapy after the intervention associated with levels of coping among physicians? (Paper III)

3.0 Presentation and discussion of material and methods

3.1 Study design

The material consisted of a consecutive sample of physicians, taking part in a prospective, longitudinal follow-up study after a counselling intervention at The Resource Centre Villa Sana, Norway. Participants were included from August 2003 through July 2005, and signed an informed, written consent. Self-reporting assessments were completed 0-4 weeks before (baseline) and 0-3 weeks (intervention satisfaction) after the intervention. Assessments at one and three year follow-up were mailed to participants (two reminders given). These were answered fifty-three weeks (SD=6.4, range 40-70 weeks) and 36.9 months (SD 1.9, range 34-44.5) after baseline respectively. See figure 1.

Figure 1. Study design
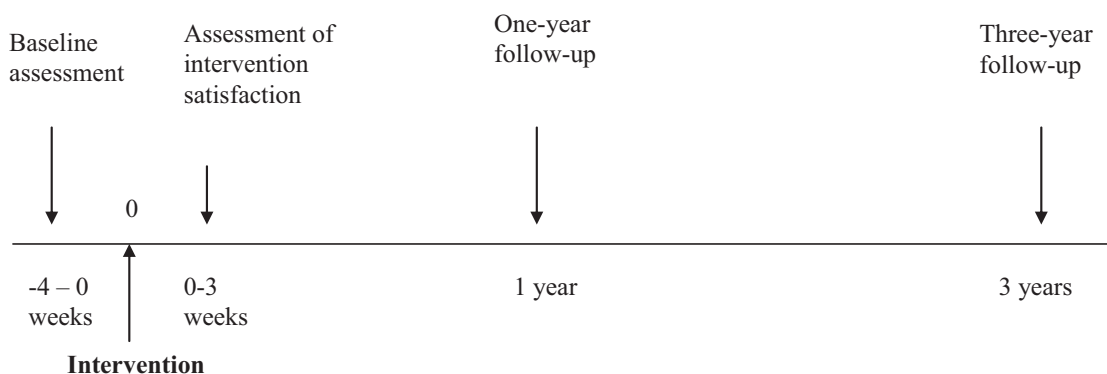
Results from the Villa Sana cohort of physicians were compared with data on age, gender, specialty, distress variables (burnout, job stress, mental distress) and work hours from surveys of Norwegian physicians in 1993 and in 2003.

3.1.1. Discussion of study design:

The present design allowed us to investigate the representativity of the physicians coming to Villa Sana in relation to Norwegian physicians in general, to follow the course of

distress longitudinally for three years after a counselling intervention, and to study factors that were associated with this course. It also gave us the possibility to investigate whether the course of emotional exhaustion in the first year after the counselling intervention was specific for physicians.

A randomized controlled design could have answered whether the intervention contributed to change in outcome measures for participants, and which physicians who were most helped by the intervention. With the present optional intervention, where physicians chose to come to a one-day or a to five-day intervention, chose if they wanted to bring a spouse or not, and should get the intervention within short time after the first contact, it was difficult to design a study with a relevant control group. Additionally, since this form of intervention for distressed physicians was new, we lacked knowledge needed to design a relevant controlled study. There was little documentation on the long-term course of distress after a low-threshold intervention like Villa Sana. We also needed to investigate which factors were associated with the course of distress, which could give us information about which factors to randomize in relation to, and which elements that should be included in interventions and examined in further studies. The present study could give us some of this knowledge, which could subsequently be used in designs to study associations between intervention and outcomes.

A program evaluation design, with at least three time-points for measures; pre- and post-intervention as well as later follow-up, could have given a certain indication about specific elements in the intervention that contributed to the course of distress. When designing the study we considered the short intervention – one day or five days – as probably too short to be able to expect changes in most of the assessments. Several of the instruments used in the study were not meaningful to use again immediately post-intervention, since they map the situation over the last couple of weeks (for example mental distress and burnout), and would thus have covered an overlapping time period before and after the intervention. The intervention was seen as an incitement to actions that could give a change in distress at a later stage. A measure of satisfaction post-intervention was, however, administered, with which we could investigate whether perceived satisfaction with the intervention could predict course of distress. In retrospect, it would have been useful to have had some adequate measures post-intervention, allowing us to evaluate the program.

Due to the study design, without a control group, we cannot determine whether the changes in reduction of distress or other variables found in this study are related to the intervention or if they show a spontaneous regression towards the mean , or if they are

related to factors not assessed in this study. Factors known to have an impact on job stress and burnout, for example social support, are not measured. As will be discussed later, there are several indications – related to data from other intervention studies and to the increase in sick leave and use of therapy after the intervention – that the reduction in distress is not solely a regression to the mean, but controlled studies are necessary to confirm these indications.

3.2 Participants

Of 242 consecutive physicians taking part in the Villa Sana programs between August 2003 and July 2005, 227 doctors (94%) gave their informed, written consent to participate in the study, 118 women (52%) and 109 men (48%). One year follow-up was completed by 185 (81%), 97 (52%) women and 88 men (48%). Three year follow-up was completed by 184 (81%) physicians, 101 women (55%) and 83 men (45%). (See Figure 2).

Initially 187 (82%) came for a counselling session and 40 (18%) took part in the course program. Eighty-one physicians (36%) came for a second intervention within a year from baseline; 57 to a course and 24 to a one-day session. Of these, 43% returned within the first eight weeks and 90% within the first six months. The physicians had the option of bringing their partner, which 90/227 (40%) did at the initial counselling session and an additional 12 (5%) to a follow-up session. Thirty-two/102 (31%) of the partners were physicians themselves, resulting in 16 physician-physician couples in the sample.

Gender, age and medical specialties of the physician sample are presented in Table 2.

Figure 2. Flow chart over physicians taking part in the study.
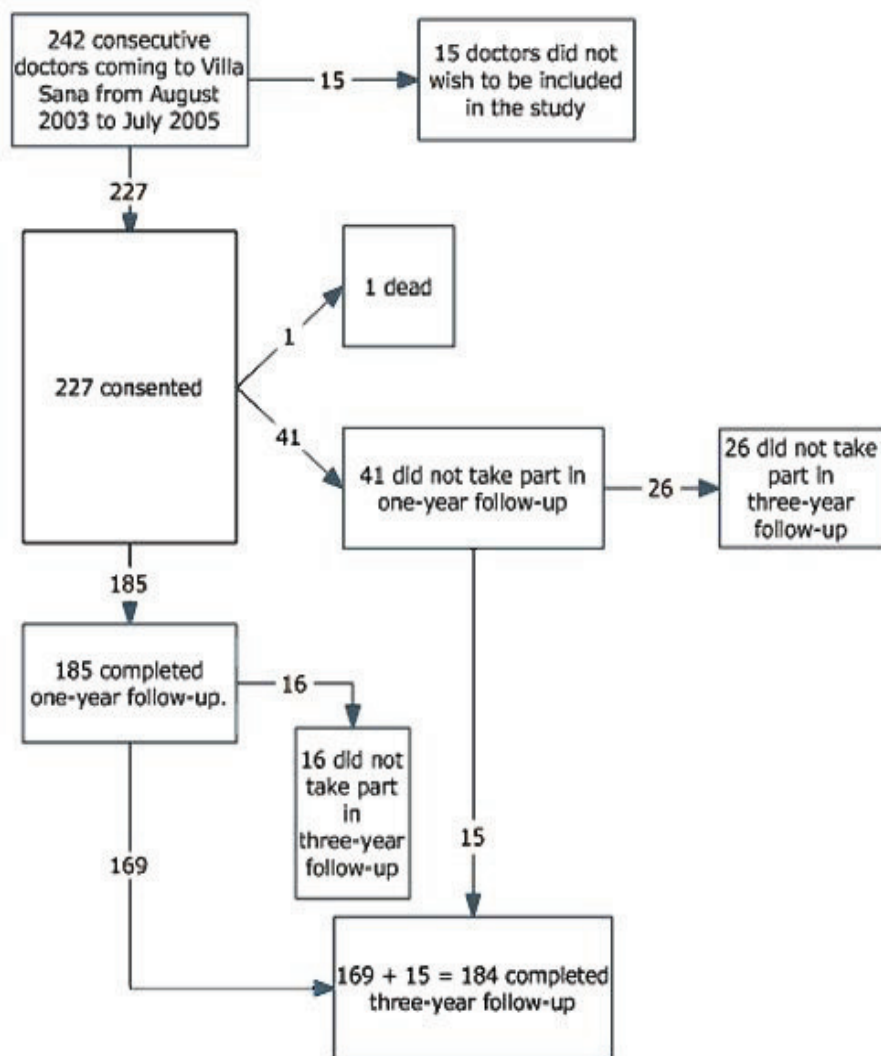
3.2.1 Attrition

The one year follow-up rate was 81%. There were no significant differences in age, gender, or distress levels between those completing and not completing one-year follow-up. Concerning medication, a higher proportion of non-completers 16/41 (38%, 95% CI 23.1-52.9) were on anti-depressants at baseline than among completing physicians. 35/183 (19%, 95% CI 13.3-24.7), Chi-square 7.01 p=0.008.

At three year follow-up 184 (81%) physicians participated, but the follow-up sample differed somewhat from that at one-year (See Figure 2). There were proportionally more women than men who completed the three-year follow-up (101/117, 86.3%, 95% CI 80.1-92.5 vs. 83/110, 75.5%, 95% CI 67.5-83.5, Chi-square =4.4, p=0.04). Physicians not completing three-year follow-up (n=43), compared with those completing three-year follow-up (n=184), had significantly higher baseline levels of emotional exhaustion (3.33 SD 0.88 vs. 3.01 SD 0.94, t=2.05, p=0.04), job stress (2.65 SD 0.74 vs. 2.39 SD 0.72, t=2.14, p=0.03) and emotion-focused coping strategies (3.25 SD 0.63 vs. 2.90 SD 0.76 t=2.75, p=0.006). There were no significant differences in age, the two other burnout dimensions, or active coping strategies.

3.2.2 Comparison groups of physicians.

To assess the representativity of the physicians coming to Villa Sana we compared the data from the present cohort to data from surveys of representative groups of Norwegian physicians.

A cross-sectional sample of Norwegian physicians was surveyed concerning health, work conditions and life quality in 1993. The sample comprised from 1009 to 6600 doctors, depending on the object of inquiry. The results are representative for all Norwegian doctors [47]. These data from 1993 reflect a situation ten years prior to the present study.

More recent representative data on Norwegian physicians from 2003 were comparable with the data from 1993 on some central measures, and could thus be used to validate the comparison with respect to present status. The 2003 data were part of a long-term, follow-up study including all doctors graduating from the four universities in Norway in 1993 and 1994, and the data used for comparison with the Villa Sana sample were collected at the 10 year follow-up of this young doctor cohort in 2003 (n= 390) [65,119].

Controlled for gender and age, there were no significant differences in mental distress (SCL5) or on the dimension of emotional exhaustion (MBI) between Norwegian doctors surveyed in 1993 and the young doctor cohort surveyed in 2003. Job stress showed a statistically significant, higher level in the young doctors in 2003 compared with all doctors in 1993, caused by the sub dimension emotional stress (1.97, 95% Confidence Interval [CI] 1.88–2.06 vs 1.72, 95% CI 1.68-1.74, p<0.001), whereas the two other job stress dimensions did not differ significantly. In general the levels of distress thus do not seem to have changed significantly through this period, indicating that the comparison

between the Villa Sana sample and the survey of Norwegian physicians from 1993 is relevant, in spite of the ten-year difference between the data collections.

In addition, we have used general statistical data on Norwegian physicians from the Norwegian Medical Association for 2004 and 2005 [120].

Comparisons between the Sana sample and Norwegian physicians are shown in Table 2.

Table 2. **Comparison between the physician cohort at Villa Sana and a representative sample of Norwegian physicians in 1993 regarding age, gender and specialties. Statistical data from the Norwegian Medical Association on Norwegian doctors in 2004/2005.**

	Sana-physicians Mean (95%CI) Percentage (95% CI) n =227	Norwegian physicians surveyed in 1993 Mean (95%CI) Percentage (95% CI) n =6602	Sign.	Norwegian physicians 2004/2005 * Mean, Percentage n =17500
Age (years)				
The whole population	46.9 (31.9-67.2)	42.5 (23.9- 60.7)	p<0.001	45
Men	49.7 (32.0-67.3)	44.0 (25.4-62.6)	p<0.001	
Women	44.3 (28.2- 60.4)	38.9 (21.5-56.3)	p<0.001	
Gender (%)				
Men / Women	48 (42-55) / 52 (45-58)	71 (70-72) / 29 (28-30)	p<0.001	64 / 36
Specialities (%)				
Non-specialist	30 (24-36)	42 (40-43)	p=0.001	45
General practice	22 (17-28)	14 (13-15)	p=0.001	13
Internal medical specialities	16 (11-21)	15 (14-16)	Ns	15
Surgical specialities	15 (10-19)	14 (13-15)	Ns	14
Psychiatric specialities	8 (5-12)	6 (5-7)	Ns	6
Others (including social med. and laboratory spec.)	8 (5-12)	9 (8-10)	Ns	8

*Data from the Norwegian Medical Association for physicians <70 years.

3.2.3. Discussion of the representativity of the sample

The sample of physicians included in the study can be viewed as representative for physicians seeking help at Villa Sana. We included consecutive physicians coming to the interventions through a two-year period, and 94% (227/242 physicians) agreed to participate. The high response rates at follow-up, both at one- and three-year, strengthen the representativity. Attrition analyses show almost no difference between those not participating at one-year follow-up compared with the participating group. The physicians not completing three-year follow-up, however, had significantly higher baseline levels of emotional exhaustion, job stress and emotion-focused coping strategies. Although this group was small, it might increase the risk for making type II-errors, since we found that the physicians with the highest initial distress levels obtained most reduction in distress through the study period. Losing some of these at follow-up could thus give seemingly lower reduction rates of distress.

We cannot know for sure how representative the Sana sample was for distressed Norwegian physicians. All physicians working in Norway theoretically had the same opportunity to seek the intervention programs at Villa Sana during the inclusion phase of this study. We found that, apart from general practice that was somewhat overrepresented, the distribution of specialties among the physicians at Villa Sana was similar to the distribution of specialists in Norway, indicating that the sample could be representative for help-seeking physicians across specialties. Although women were somewhat overrepresented in relation to proportion of women physicians in Norway, the sample should be representative for both genders. The average age of physicians at Villa Sana was higher than for Norwegian physicians, indicating either a reduced representativity, or that the help-seeking physicians were over-represented in the higher age groups. In 2006, a representative group of Norwegian physicians was asked whether it had any knowledge about the Villa Sana programs. Only 53% of the physicians reported such knowledge, less among younger physicians and among physicians in the north of Norway (Villa Sana is located in the south of Norway) [121]. This might threaten the representativity to some extent.

It is well known that physicians often need prompting or referral to health service facilities. As the reduction in distress parameters for those being prompted or "referred" by a colleague to participate in the Villa Sana interventions, did not differ significantly from the reduction in physicians coming on their own initiative, we view this as strengthening the

representativity of the results with respect to the general group of Norwegian physicians in need of help.

The sample is thus estimated to be representative for physicians coming to Villa Sana, whereas the representativity for help-seeking physicians (in relation to burnout and mental distress) in Norway can be more questionable.

3.3 Interventions at the Resource Centre, Villa Sana

The Resource Centre for health personnel, Villa Sana, was designed and established in co-operation between the psychiatric hospital Modum Bad and the Norwegian Medical Association, in 1998 [122]. Based on the experiences with physicians referred to in-patient treatment with severe levels of and dysfunctional consequences from distress [101], and findings in a national physician survey showing relatively high levels of distress [47], the aims of the program were to strengthen professional identity, enhance health and life quality, and to prevent burnout [122].

As providers at the centre were recruited from the nearby psychiatric hospital, the interventions were based on experiences from the treating environment, using psychodynamic, cognitive and educational elements in an integrative approach, but in a counselling, and not a treatment, setting.

Physicians could choose to participate in one of two different types of interventions.

One day counselling: This was a single day, six to seven hour long counselling session. The physician was counselled by a psychiatrist or a specialist in occupational medicine (MD), working at the centre. Shorter breaks were taken during the day and a longer break after lunch (30-45 minutes). The counselling conversation was complemented by the counsellor and the help-seeking physician eating lunch together, and sometimes "talking while walking" together. As this was a non-treatment setting, medical records were not taken and confidentiality was thus ensured. After being invited to describe his or her situation, the physician was asked to map both work-related and private contextual factors contributing to stress. Coping strategies, often related to sources of identity, self-esteem, and self-reliance in the individual were identified, acknowledged, and challenged. The physician's present needs in both a short and a longer perspective were clarified, and it was usually recommended that the physician actively should deal with these needs (for example

by stress reduction as in reducing work hours, a period of sick leave or obtaining treatment such as psychotherapy).

Five day group-based course: The second type of intervention was a five day, group-based course for eight physicians, boarding at the Centre, and led by one of the above-mentioned counsellors in collaboration with an occupational therapist. Daily 90 minute long interactive lectures covering areas of possibilities and restraints in working life, the individual's resources and personality, concepts of identity, prevention of burnout, team work, communication and family relations were given. Group sessions were scheduled daily (60-90 minutes), based on the participants´ own experiences, providing the possibility to share these issues with colleagues. Physical, almost exclusively outdoor, activities were organized daily for the participants (60-90 minutes). The sessions were instructed by the occupational therapist, with her competence in running sessions of physical activity, or by a physical activator from the nearby hospital. One day during the course participants and personnel extended the physical activity by going on a physically active excursion; skiing, cycling or walking (according to climatic conditions). Food to be prepared over an open outdoor fire was brought in backpacks prepared by the housemother at Villa Sana. The excursion lasted between three to four hours. The group setting around the open fire provided possibilities for more informal group discussions, and experiences from the excursion often revealed new viewpoints upon the themes brought up during the week. The peer interaction, both in the formal and informal group settings, during the common meals, and in groups of two or more during remaining free time, was reported to be one of the most valuable elements for the participants. This is an important and possibly modelling experience for later interactions with colleagues, since many physicians worry about such group interaction beforehand. An individual counselling session (60-90 minutes) was offered to the participants during the week, providing the opportunity to discuss individual issues in more depth. Cultural elements were part of the program. An evening concert was given exclusively for the course participants by a trio of musicians (Trio Sana), and the physicians were invited to participate in the cultural programs at Modum Bad, including concerts and church services. During the week there was time for individual reflection and relaxation. The area around Villa Sana is perfect for walking or other physical exercise and bicycles were available.

Physicians could bring their partner to the counselling session and to the week-long courses for couples. The program was basically similar for physicians with or without

partners, but the presence of partners encouraged discussions around problems related to the work-home interface.

Villa Sana is available for all physicians working in Norway. The programs were designed to be easily accessible and to ensure confidentiality. Since the programs are defined as counselling, and not treatment, no medical records are taken and no governmental insurance agencies are involved, enhancing the possibility for confidentiality. Offering counselling, instead of treatment, was an important aspect of lowering the thresh-hold for help-seeking. Procedures for application were made simple. Counselling appointments could be made directly on the phone, by post or by e-mail, and no referral was needed. It has been a policy to have time readily available for counselling. There are few restrictions as to reasons for contact. If need for immediate medical treatment was discovered, like serious risk for suicide or psychotic breakthrough, the applicant would be recommended psychiatric treatment instead. The week-long courses required a short, written application where we asked the applicants to describe their situation and to give their reasons for seeking help.

The programs have been presented and regularly announced in the journal of the Norwegian Medical Association, in addition to internet links to web-pages about Villa Sana from the Norwegian Medical Association´s web pages, as well as from Modum Bad´s web pages. Members of the staff at Villa Sana have also frequently been invited to meetings for different groups of physicians to inform about the program.

Villa Sana is funded by the Sickness Compensation Fund of the Norwegian Medical Association, which covers all expenses, including travelling costs, making it possible for physicians from all parts of Norway to use the intervention.

3.4 Instruments

In the following, the concepts of reliability and validity of data in a study will be discussed briefly. The instruments used as variables in this thesis will then be presented, considering reliability and validity for the data related to the individual instrument. In Table 5, baseline scores for variables in the study are shown (gender, age and specialties have been presented above, in Table 2)

Reliability:

Reliability is an estimate of how precise the measures of the data in a study are. There are three kinds of reliability to be considered; inter-rater reliability, test-retest reliability, and internal consistency between items in a scale [123] pp 119-127. Cronbach´s alpha, a measure of the internal consistency, has been measured for most of the instruments used in this study, and reported for baseline measurements below under the individual "measures". There is no reason to believe that Cronbach´s alpha for an instrument would vary substantially from one measurement to another in the same cohort. For the outcome measures, the mean values of Cronbach´s alpha for the three time points were 0.89 for emotional exhaustion, 0.90 for SCL5, 0.91 for job stress, 0.81 for active coping and 0.84 for emotion-focused coping. These measures, together with the values for internal consistency of other instruments as shown below, indicate that the data in the study have acceptable internal consistency [124]. A low internal consistency would increase the risk of making type II-errors. Test-retest reliability could have indicated if there were systematic errors in the way respondents score a questionnaire. In the present study this was not examined. Since the study only included self-report questionnaires, inter-rater reliability was not relevant.

Validity.

The validity indicates to what degree the measurements in a study give information about the phenomenon that we wish to measure [123] pp 119, 127-129.

An important aspect of validity is whether the instruments used actually measure the constructs we wish to investigate. Comparing study measures to a "gold standard", for example a clinical evaluation of distress levels in the participants, would have been a good validation of the data, but lay outside the scope of this study. The main instruments in the study were chosen based on the assumption that they would be appropriate measures of the underlying constructs that we aimed to assess, since they largely have been validated in other studies.

All data in the study were self-reported. There has been an assumption that self-reported data are less valid than data from interviews. Self-reported data have, however, been found to be just as, or even more, valid than interview data in some respects, for example possible bias from a clients´ tendency to "please" the interviewer, so-called "socially desirable responding" [125]. A combination of data from interviews and self-

report could have the potential to use different sources of information to define the same construct, thus securing the precision of the description. In addition, data based on memory of shorter or longer periods have a potential recall bias. Objectively observed data of, for example, sick leave during the past year could possibly have given more accurate data, but lay outside the scope of this study.

3.4.1 Outcome measures

Burnout

We chose Maslach´s Burnout Inventory (MBI), with three sub-scales; emotional exhaustion (10 items), depersonalization/cynicism (8 items), and reduced personal accomplishment (7 items) to assess burnout [5], as most of the studies assessing burnout have used it and the psychometric qualities are well documented, especially in human services professions. (Items are shown in Appendix.) Schaufeli and Enzmann discuss these and conclude that the validity and reliability of the instrument are relatively good in many studies and seem to keep these properties also in non-English versions of the instrument [36].

The items were scored according to how well they described the individual's situation during the last two weeks on a five-point scale (1–does not fit, 5–fits very well). This scale has been validated in samples of Norwegian physicians, and also utilized in representative groups of other professions in Norway [17,126]. Originally, as described previously, the MBI was scored with an intensity and a frequency scale, where the two correlated highly (r>.80) [2] p 55. This could give reason to believe that the present results, measured with an intensity scale, describe a construct that is not very different from measurements with the more usual frequency scale. The use of the five-point intensity scale could, however, be a weakness in this study, in relation to comparing levels and change in emotional exhaustion with international studies. An important strength with the scale is that it allows us to compare the Villa Sana cohort with Norwegian cohorts of physicians [17].

Cronbach´s α in the present study were 0.92, 0.69 and 0.71 respectively for the three dimensions at baseline. This indicates a high reliability of the emotional exhaustion-dimension which is the dimension mainly used in this study, while the reliability of the two other dimensions are somewhat lower.

As was done in the representative sample of Norwegian physicians surveyed in 1993, emotional exhaustion was dichotomized in high and low, with cut-off >3 called

"case" [17]. We tested the discriminate value of caseness of emotional exhaustion in relation to other central measures in the study, as shown in Table 3.

On baseline measures, participants above and below the cut-off on emotional exhaustion, showed highly significant differences on mental distress (SCL5), job stress, neuroticism and on coping strategies (see Table 3). In addition, the cut-off had a predictive value on number of weeks on sick-leave after the intervention (see Table 3). This could strengthen the clinical significance of using this cut-off. The cut-off on emotional exhaustion did not, however, differentiate between scoring over or under the cut-off for case-ness used for SCL5 (see below).Subsequent studies should test different values in order to establish the optimal cut-off level.

Table 3. Comparison of measures for groups of physicians scoring above or below cut-off on Emotional exhaustion at baseline.

	Participants scoring under cut-off on emotional exhaustion Mean (SD)	Participants scoring over cut-off on emotional exhaustion Mean (SD)	t-test or Mann-Whitney U-test p-value
SCL5	2.42 (1.03) n=110	3.35 (0.97) n=117	t=6.99 p<0.001
Job stress	2.05 (0.62) n=114	2.84 (0.60) n=110	t=9.67 p<0.001
Neuroticism	1.96 (1.64) n=117	3.54 (1.60) n=110	t=7.34 p<0.001
Active coping	3.40 (0.57) n=117	3.13 (0.65) n=109	t=3.33 p=0.001
Emotion-focused coping	2.69 (0.64) n=116	3.26 (0.75) n=109	t=6.15 p<0.001
Weeks on full-time sick leave or disability/rehabilitation benefits	5.0 (10.7) n=98	12.8 (17.0) n=82	z=3.24 p=0.001

The burnout-dimension emotional exhaustion has been used in this study as an indicator of distress and a measure of change in distress over time, as has been done in other studies of interventions [109,113,117]. This dimension, which has been found to be the most robust and reliable subscale, has, however, also been found to be the least specific, with overlap to related concepts such as depression and perceived work stress [2] pp 37-40. To investigate if emotional exhaustion had sufficient discriminant validity to differentiate it

from the other outcome measures i.e. that the instruments had an inter-correlation that was not too high, Campbell and Fiske´s test for discriminant validity was used. This is based on the correlation between two scales and the internal consistency of the respective scales. They use a "correction for attenuation formula" which divides the correlation between scales by the root of the product of the internal consistency values (Cronbach´s alpha) for each of the scales. A disattenuated correlation below the – somewhat arbitrarily chosen - value of less than 0.85, according to Campbell and Fiske, indicates that the scales measure different constructs (i.e. demonstrate discriminant validity)[127]. In the present study, these values for the relationships between emotional exhaustion and mental distress, job stress, emotion-focused coping and neuroticism respectively, were between 0.56 and 0.74, indicating that discriminant validity exists and that the measures not only describe the same construct.

The correlation between distress measures was, however, relatively high; between emotional exhaustion and SCL5 the correlations was 0.53 and between emotional exhaustion and job stress 0.68. Correlation between instruments depends on the internal consistency of the respective instruments. In this study the alpha-values of emotional exhaustion, SCL5 and job stress have relatively high alpha-values around 0.90. The correlations found could thus reflect a value near to the true correlations between the scales. The relatively high correlations imply a risk for problems with co-linearity when performing a regression analysis, if the variables are included in the same equation. In this study these variables have therefore been assessed and examined separately.

Mental distress

This was measured by SCL-5, a five-item version of the Hopkins Symptom Check List HSCL-25, covering anxiety and depression [128]. (Items are shown in Appendix.) The 25-item version (HSCL25) has been used in Nordic countries for screening purposes and has demonstrated satisfactory sensitivity and specificity for screening of psychiatric disorders based on a comparison with diagnosis based on the Structured Clinical Interview for DSM-III-R (SCID) [129]. The 5-item version has been found to perform almost as well as the 25-item-version, with a correlation between the two instruments of 0.91 [130]. The items were scored on a five-point scale (1 - not at all, 5 – very much) evaluating the last two weeks. This scale has been used in previous studies among Norwegian physicians [60,131]. Cronbach´s α in the present sample was 0.90 at baseline, indicating a high reliability.

SCL is usually scored on a four-point scale. With this scale, a cut-off at 1.67 for men and 1.75 for women indicating psychiatric case-ness/need for treatment has been defined [128,132]. These gender-related cut-off values were multiplied with 5/4 to give rough case-estimates for the five-point scale, yielding a cut-off of 2.09 for men and 2.19 for women, used in this study (Moum T, personal communication). Strand et al have suggested a gender-neutral cut-off for SCL5 of 2.0 [130]. Multiplying this by 5/4 yields a cut-off at 2.5 for the five-point scale. This cut-off would define 59% of the physicians coming to Villa Sana above cut-off and thus in potential need of treatment (compared with 73% with the cut-off used in the present study). The cut-off for emotional exhaustion also differentiates in relation to this cut-off on SCL5, as illustrated in table 3. Both of the SCL5 cut-off estimates indicate that there is a relatively high prevalence of physicians that could be in need of treatment in the cohort.

Perceived job stress

Perceived job stress was measured with a modified version of Cooper´s Job Stress Questionnaire [64]. This was translated into Norwegian and used in the national survey of Norwegian physicians in 1993 [47]. Some items were found to be too specifically related to issues concerning general practitioners in Great Britain [29,47] and a modified version of the questionnaire was therefore constructed and used in the Norwegian student/physician cohort [29]. In an exploratory factor analysis (Principal component analysis with varimax rotation) the job stress measure yielded three factors in one study [29] and four factors in a longitudinal follow-up of the same cohort [65]. The four factors covered emotional stress, work-home interface stress, time pressure and stress due to fear of complaints/criticism (fear of litigation).

Seventeen items from the modified version of the questionnaire used in the Norwegian student/physician cohort were selected from a Principal Component Analysis for this study. In addition, nine clinically prompted items from the questionnaire were included. The resulting 26 items had a Cronbach´s alpha α =.90 in the present sample which indicates a high reliability. The items were distributed in three sub-scales in the following way: Emotional stress (10 items, α = .83) measuring stress associated with meeting sick and dying patients and relatives. Social stress (10 items, α = .83) measuring work-home interface stress and time stress. Stress associated with the risk for committing errors or being accused of errors or malpractice (6 items, α =.85) here called "fear of litigation". The items were scored on a five-point scale (1 = no stress, 5 = very much stress), with reference to the

two last weeks at work. (Items are shown in Appendix). We assess the validity to be adequate. Firstly because most of the items are from an instrument that has been validated among physicians [64], and used in other cohorts of Norwegian doctors [47,65]. Secondly because the items included were recognizable as stress factors cited by physicians through several years of "clinical" experience at the Villa Sana counselling centre.

Ways of coping

Coping strategies were measured by Vitaliano´s version of Folkman and Lazarus´ Ways of Coping Checklist [80]. Vitaliano defined two main dimensions of coping strategies; the more adaptive ways of coping, including problem-focused coping and seeking social support, and the potentially maladaptive ways of coping, including blaming self, wishful thinking and avoidance. This checklist, with the five-factor structure, validated by Vitaliano et al in a sample of medical students, was replicated in a Principal Component Analysis in the Norwegian student/physician cohort where the five factor structure was replicated with a convincing consistency by a principal component analysis in the Norwegian cohort [81], grouping the items into similar factors.

Eighteen of the 42 items used in the Norwegian young doctor cohort were selected from a Principal Component Analysis. Nine of the items were among the adaptive strategies, four items on "problem-focused coping" and five items regarding "seeking social support". In this study they are called "active coping strategies" (α =.81). Among the potentially maladaptive strategies seven items measured "wishful thinking" and two items measured "blaming self". In this study they are designated "emotion-focused coping strategies" (α=.82). (Items are shown in Appendix). The alpha-values indicate a high reliability.

Scores were given on a five-point scale (1=does not fit at all and 5=fits completely).

The use of the outcome variables in the respective papers are shown in Table 4.

Table 4. Main outcome variables in the papers.

Main outcome variables	Paper I	Paper II	Paper III
Maslach burnout Index MBI or Emotional exhaustion	X	X	X
Mental distress SCL5	X	X	
Perceived job stress	X	X	X
Ways of coping			X

3.4.2 Other measures.

Socio-demographic variables:

Gender: Women physicians have in some studies been found to have higher levels of burnout and depressive symptoms than men, and the impact of different types of stress on mental health could be gender-dependent. Gender was coded 1 for men 2 for women.

Age: Studies of distress in physicians have shown higher levels of distress in young physicians, but have also indicated an increase in distress with age among women physicians. Age was measured as a continuous variable.

Marital status: Several studies have emphasised the importance of social support, also in the private situation, for handling stress. The importance of social support could differ between genders. Marital status was measured in the categories: not in a relationship, common-law spouse, married, judicially separated, divorced, widowed. The responses were dichotomized into living alone or living with a spouse.

Having children below 16 years of age was presumed to indicate a degree of stress related to the work-home interface. (Dichotomous variable).

Specialties:

Specialties were mapped in order to assess the representativity of the present sample in relation to Norwegian physicians in general.

The medical specialties were grouped into: non-specialist (including internship, physicians in specialty training as well as general practitioners without specialty), general

practitioners with specialty, internal medical specialties (paediatrics, physical medicine and rehabilitation, dermatology and venereology, internal medicine, haematology, endocrinology, gastroenterology, geriatrics, neurology, cardiology, infectious diseases, pneumology, nephrology, rheumatology, oncology, ophthalmology, and tropical medicine), surgical specialties (anaesthesiology, obstetrics and gynaecology, general surgery, vascular surgery, orthopaedic surgery, thoracic surgery, urology, maxillofacial surgery, neurosurgery, plastic surgery, and otorhinolaryngology) , psychiatric specialties (including child psychiatry), public health (including occupational medicine) and laboratory medicine (immunology, clinical physiology, clinical biochemistry, clinical neurophysiology, medical genetics, medical microbiology, radiology, pathology, clinical pharmacology, anatomy, biochemistry, and physiology) as has been done in previous studies of Norwegian doctors [47].

Help-seeking:

Ways of help-seeking:

Physicians have been known to be reluctant to seek help. We therefore wanted to map in which way the participants came to Villa Sana. They could indicate whether they came by "referral", "prompted by a physician", "prompted by another colleague", "on their own initiative" "because partner urged them to" or for "other reasons". The responses were given on a dichotomous scale (0-no, 1-yes). If more than one category was confirmed, the highest category was registered, in the order they are presented above. In the first paper the categories prompted by a physician or prompted by another colleague were merged. There we wanted to differ mainly between being urged by someone to come, or coming on one´s own initiative. In the second paper, prompted by a physician or referred (by physician) were merged to one category, versus remaining categories. We hypothesized that being urged or referred by a physician implied that a medical evaluation had been done, and that the physician thus could have experienced more consequences of distress, or had more long-standing distress.

Reason(s) for help-seeking:

The reasons for help-seeking were derived mainly from the three-fold aim of the Resource Centre Villa Sana: to strengthen professional identity, to enhance health and life quality, and to prevent burnout.

Participants could indicate how important problems relating to each of the following six areas were for seeking counselling at the Resource Centre: health and life quality,

exhaustion/burnout, professional identity (meaning identification with the role as a physician [133]), work-related conditions, private relations and "other reasons" with an option for free text. The items were scored on a five-point scale (0- not decisive for help-seeking to 4-decisive for help-seeking). Scores 3 or 4 were considered "weighty reason".

Personality traits

To assess personality traits we used Eysenck´s personality questionnaire (EPQ) [76] in an abbreviated form, with 6 items in the neuroticism scale and 6 in the intro-extrovert scale [134]. The shortened versions have in one study been found to share 82% and 83% respectively of the variance with the original scales [135]. The EPQ scales have been considered as good 'markers' for relatively well-established personality factors [136], and the subscales resemble those in other personality inventories, for example Basic Character Inventory, which has been used among Norwegian physicians [29]. This can indicate that the instrument is fairly valid.

Cronbach´s α in the present sample were .70 and .80 respectively for the EPQ scales at baseline. Considering that the scale for neuroticism consists of six items, the reliability can be considered satisfactory with a Cronbach´s of 0.70 (Cronbachs α increases with number of items in a scale). The relatively low α could, however, increase the risk for type II-errors in relation to this dimension (due to attenuated correlations). Items were scored dichotomously (1-yes or 0-no), and a sum score from 1-6 was obtained for each dimension, where higher scores designated more neuroticism or being more extrovert. (See items in Appendix).

Personality traits should be evaluated in "normal" circumstances, and generally not in a state of distress [137]. In this study, the personality traits were measured at baseline, when levels of distress were relatively high for some individuals, and there is thus an uncertainty as to whether it is exclusively the construct neuroticism that is measured, or how much this is influenced by present depressive symptoms. The change found in neuroticism from baseline to three-year follow-up should therefore be interpreted with caution. The change seen in neuroticism, however, occurred mainly between one- and three-year follow-up, during which period distress scores were relatively stable, which could indicate that the change was less influenced by distress measures. As with other measures, a reduction in levels could indicate a regression towards the mean. These relationships need to be further investigated.

Suicidal disposition:

This was measured by three of Paykel´s five items [138]: "Have you ever had thoughts about taking your own life?" scored on a five-point scale (0 – never, 4 - very often), "have you ever been in the situation of seriously considering to take your own life, and even planning how you would do so?" and "have you ever attempted to commit suicide?"(Both items scored dichotomously 0 - no and 1- yes). These variables have been used in other studies among Norwegian medical students and young physicians [61]. They are used as single items which can reduce the reliability, but in this study they are used as a complement to the measurement of depressive symptoms.

Attending medical treatment/psychotherapy:

Since physicians are reluctant to seek treatment, one aspect of counselling at Villa Sana was to motivate the participants to seek treatment when needed. Being in current treatment with a general practitioner, attending psychotherapy with a psychiatrist or a psychologist and taking anti-depressants was therefore mapped at baseline. The same forms of treatment were then mapped for the first year of follow-up.

Sick leave/Rehabilitation/Disability benefits:

Physicians have been found to have lower rates of sick leave than other groups, and the use of sick leave might be too low [22,25]. When relevant, sick leave was discussed during the intervention as one way to reduce emotional exhaustion. Number of weeks on full-time/part-time sick-leave/rehabilitation/disability during the preceding year and registration of present status was therefore mapped.

Work hours:

Weekly work hours:

The participants were asked to state the number of hours per week used in direct patient contact, meetings, paperwork, on the telephone etc, research, and "other work-related activities". A sum score of total number of work hours per week was calculated. This measure has been used in the survey of Norwegian physicians, and the physicians at Villa Sana can thus be compared on this variable [131].

It is uncertain if the participants have included "voluntary overtime" in their report of work hours. The number of actual work hours could thus be underestimated.

Reduction of work hours after the intervention:

Reduction of work hours could be one way of handling emotional exhaustion. Work hours per week at baseline minus work hours per week at follow-up, both at one and three years, reported continuously and dichotomized (reduction =1 and no change or increase =0), was therefore calculated.

Satisfaction with the intervention:

The questionnaire was developed at the Research Institute of the Norwegian Medical Association, and was originally used as a basis for a preliminary evaluation of the services at Villa Sana after the two first years [139]. This questionnaire was administered with instructions to complete it immediately or as soon as possible after the intervention was ended, and comprised the following questions.

(i) "How high were your expectations to the counselling session?" scored on a five-point scale (1-very small to 5-very high).

(ii) "Did the counselling session correspond to your expectations?" scored on a five-point scale (1- not at all to 5- corresponded completely to the expectations including "better than expected").

(iii) "Did the counselling session contribute to clarify important factors in your situation?" scored on a four-point scale (1- not at all to 4- to a substantial degree).

(iv) "Do you feel more able to handle your problems after the counselling session?" scored on a three-point scale (1 – no, 2 – a bit more able, 3 – much more able).

These measures have not been validated in cohorts outside of Villa Sana. We found an association between one of these items (counselling corresponded to expectations) and reduction in emotional exhaustion among men, but no association with the other two items. As the three last items measure related issues, we have later investigated whether an index consisting of a sum-score of the three variables was associated with reduction in distress, but did not find any significant relationships, either in the whole sample or gender-wise.

Attending one or two interventions at Villa Sana:

Physicians attending a one-day counselling session could be advised to return for a five-day course. They also sometimes returned for a new individual counselling session, for example together with their spouse. This was registered as 1-no additional intervention or 2- an additional intervention

Table 5 shows baseline scores of variables (gender, age and specialty presented above in Table 2)

3.4.3 Missing data:

For the instruments mental distress (SCL5), active and emotional coping, and neuroticism there were few missing data (up to1.6%). Among respondents 0-3/227 did not score at all at baseline, 2-4/185 at one-year and 1-2/184 at three-year follow-up

The items concerning job stress and to a certain degree emotional exhaustion were not relevant for all respondents because of variations in working conditions (for example not working directly with patients, not working nights, not working with dying patients, or not being in a position to treat family or friends). The non-relevant items were, unfortunately, registered as missing data, giving a frequency of missing data up to 11.7% on job stress and 1.7% for emotional exhaustion. Because the frequency of missing data for the other outcome variables generally was low, the scored variables probably comprise the items relevant for the individual physician's experienced job stress or emotional exhaustion. When examining the different job stress dimensions, 17% of answers to items of "emotional stress" were missing (baseline), whereas for "social stress" answers to 4.4% of the items were missing and for stress due to fear of litigation 5.4%. This could make the use of the emotional stress dimension uncertain. Among respondents 3-4/227 did not score these instruments at baseline, 6-10/185 at one-year and 10-18/184 at three-year follow-up.

Due to administrative problems the variables for satisfaction measures of the intervention were missing for 34 individuals. They should not be missing in any systematic way, but are considered as randomly missing. There were no significant differences in demographic or distress variables between the groups with and without missing satisfaction variables, indicating that the results should not be significantly influenced by this.

Table 5. Baseline scores of variables

		Mean (SD)	Proportion, %
Outcome measures n=220-227	MBI – emotional exhaustion (1-5)	3.07 (0.94)	
	MBI – reduced empathy (1-5)	1.92 (0.56)	
	MBI – reduced capacity (1-5)	2.28 (0.51)	
	SCL-5 (1-5)	2.88 (1.10)	
	Job stress: Total (1-5)	2.44 (0.73)	
	Job stress: Emotional(1-5)	2.12 (0.79)	
	Job stress: Social (1-5)	2.81 (0.84)	
	Job stress: Fear of litigation (1-5)	2.23 (0.87)	
	Active coping strategies (1-5)	3.27 (0.63)	
	Emotion-focused coping strategies (1-5)	2.97 (0.75)	
Demographic variables	Marital status. Proportion married or cohabitant.		184/227 81
	Proportion who have children under the age of 16 years		111/226 49
Ways of help-seeking	Referred		23/227 10
	Prompted to come by physician		66/227 29
	Prompted to come by another colleague		18/227 8
	Own initiative		103/227 45
	Partner urged them		13/227 6
	Other reasons		4/227 2
Reasons for help-seeking (0-4) Percentages for scoring >2 ("weighty reason for help-seeking") n=223-225	Health and life quality (0-4)	2.83 (1.32)	151/225 68
	Exhaustion/Burn-out (0-4)	2.52 (1.54)	137/224 61
	Private relations (0-4)	2.43 (1.55)	126/224 56
	Work-related conditions (0-4)	1.97 (1.58)	98/224 44
	Professional identity (0-4)	1.32 (1.53)	63/224 28

Personality traits n=227	Neuroticism (0-6)	2.72 (1.80)	
	Extroversion/Introversion (0-6)	3.57 (2.01)	
Suicidal disposition	Suicidal thoughts (0-4) n=227	1.15 (0.94)	
	Serious suicidal thoughts with plans		47/227 21
	Attempted suicide		6/227 3
Treatment at baseline	In treatment with a GP at present		88/226 39
	In psychotherapy at some point during the last year		47/227 21
	On antidepressants at present		51/225 22
Sick leave and disability/ rehabilitation benefits	Full-time sick-leave at present		79/226 35
	Part-time sick-leave at present		9/226 4
	Full-time disability/rehabilitation benefits		2/226 1
	Part-time disability/rehabilitation benefits		4/226 2
	Number of weeks on full-time sick leave/ during the preceding year n=208	4.6 (7.7)	
Work hours/week n=215		43.33 (8.57)	
Satisfaction with the intervention n=172-174	How high were your expectations to the counselling session?" (1- 5)	3.73 (0.63)	
	Did the counselling session correspond to your expectations? (1-5)	4.44 (0.63)	
	Did the counselling session contribute to clarify important factors in your situation? (1-4)	3.57 (0.55)	
	Do you feel more able to handle your problems after the counselling session? (1-3)	2.37 (0.53)	
Coming to an additional intervention			82/227 36

3.5 Statistical analyses:

The statistical analyses were performed using the Statistical Package for Social Science (SPSS) versions 13.0, 14.0, 15.0, 16.0 and the Structural Equations Modeling Program EQS 6.1, beta version.

Means, frequencies (with 95% Confidence Intervals), and Pearson's product moment correlations were used. Differences in mean scores for continuous, normally distributed variables were analyzed with t-tests (for independent and paired samples) and for non-parametric data with Wilcoxon´s rank test for paired samples and Mann-Whitney U test for independent samples.

Differences in proportions were investigated with chi-square test for independent samples and with McNemar´s test for dependent measures.

ANCOVA was used to compare means between the present sample and the representative samples of Norwegian doctors, providing the possibility to control for differences in gender composition and age.

Predictions of change in emotional exhaustion were analyzed with multivariate linear regression analysis.

Change over three time-points was tested with repeated measures ANOVA (baseline, one year and three year), by time and by interactions between time and other variables (contrast repeated) for continuous data and with McNemars test for dichotomous variables.

Effect sizes using pooled SD were calculated according to the method of Cohen, defining values of <0.20 as indicating no effect, 0.20-0.49 indicating small and 0.50-0.79 indicating moderate effect [140].

A p-value < .05 was considered statistically significant.

Advanced models for temporal interaction among variables were studied by Structural Equation Modelling (EQS). This method makes it possible to test whether a change in one variable precedes changes in other measures within the same time span. However, directional effects verified with structural equations modelling, are statistical constructs and are not necessarily equivalent to causality. The sample size in the present study was adequate for maximum likelihood estimation of models with a small number of parameters to be included [141]. Cross-lagged and synchronous panel models examined the relationships between two parameters at a time, and the subsequent path model examined the interplay between the significant pathways. The path model was constructed with the help of The Wald and the Lagrangian Multiplier tests. The method is described in more detail in Paper III.

3.5.1. Discussion of statistical methods

In linear regression analysis there are several methods for entering predictors, and the dependant variable in a follow-up study can be change score or score at follow-up adjusted for baseline score. In this study we have used forced entry of predictors, based on results in previous studies. We have used a change-score of emotional exhaustion as dependant variable. It can be discussed whether a linear regression analysis with a change-score as the dependant variable, should include a baseline adjustment for this variable, but in this study we have not adjusted for baseline level of emotional exhaustion [142].

The advantage of structural equation modelling is the possibility to explore the temporal association between variables measured simultaneously at two or more occasions indicating an influence from the one upon the other. In the present study, we obtained an indication of how and whether change in emotional exhaustion was preceded by or influenced upon by the other outcome measures. The sample size is an important factor in structural equation modelling techniques [141,143]. In order to limit the number of variables in the model, since the number of cases in the study was limited, observed variables, rather than latent, were used. This was possible since the internal consistencies of the measures were acceptable. The constructed models fitted the data quite well as indicated by the satisfactory levels of model fit indices. In spite of restrictions due to the limited sample size, the main relationships between the examined variables were generally consistent at one and three year follow-up, increasing our confidence in the results.

The statistical significance found in relation to change in distress, does not necessarily indicate a clinically significant change. It is therefore important to evaluate the clinical significance of the statistical changes found. Calculating effect sizes of change, in this study with one of the methods by Cohen [140], we generally found upper medium effect sizes of change, indicating that the changes found could have certain clinical, and not only statistical, significance. A change from "case-ness" to "non-case-ness" on SCL5 and emotional exhaustion could also indicate a clinically significant change, and has been presented. Other ways of estimating clinically significant change could be related to work ability, supported by the reduction in degree of sick leave from baseline to one- and three-follow-up.

4. Ethics

Participants signed an informed, written consent. The study was approved by the Data Inspectorate through the Norwegian Social Science Data Services. The Regional Ethical Research Committee in the South of Norway did not find special consent necessary for this study.

5. Results and summaries of papers.

5.1 Paper I

Does a self-referral counselling program reach doctors in need of help? A comparison with the general Norwegian doctor workforce

Karin E Isaksson Rø, Tore Gude, Olaf G Aasland. *BMC Public Health* 2007: 7;36

Background: Doctors have a relatively high degree of emotional distress, but seek help to a lesser degree and at a later stage than other academic groups. This can be deleterious for themselves and for their patients. Prevention programs have therefore been developed but it is unclear to what extent they reach doctors in need of help. This study describes doctors who participated in a self-referral, easily accessible, stress relieving, counselling program in Norway, and compares them with a nationwide sample of Norwegian doctors.

Methods: Two hundred and twenty seven (94%) of the doctors, 117 women and 110 men, who came to the resource centre Villa Sana, Modum, Norway, between August 2003 and July 2005, agreed to participate in the study. Socio-demographic data, reasons for and ways of help-seeking, sick leave, symptoms of depression and anxiety, job stress and burnout were assessed by self-reporting questionnaires, and compared to data from Norwegian doctors. Means, correlations, Students' t-test, Chi-square and ANCOVA were used (regression analyses were not used).

Results: Forty-five percent of the doctors came to Villa Sana on their own initiative, 37% reported that they were prompted by a colleague, 10% were referred, 6% came because they were asked by their partner and 2% came "for other reasons".

Problems relating to health and life quality were reported by 68% and exhaustion/burnout by 61% as weighty reasons for coming to Villa Sana. More women than men reported exhaustion 69% (95% CI 60-77) vs 52% (95% CI 42-61), p=0.01 and more men than women reported private relations 65% (95% CI 56-74) vs 48% (95% CI 39-57), p<0.05 as weighty for coming. Problems with professional identity were reported by 46% (95%CI 27-55) of those younger than 40 years, by 30% (95% CI 21-39) for those between 40-50 years and by 19% (95%CI 10-27) for those above 50 years of age, p<0.01 for differences between the youngest and the oldest group.

Controlled for gender and age, Sana doctors scored 3.11 (95% CI of SE 3.00–3.22) on emotional exhaustion vs 2.52 (95% CI of SE 2.46–2.57) for Norwegian doctors, p < 0.001. Dichotomized 49% of the Sana doctors scored above a cut-off (>3) on emotional exhaustion, compared with 25% of all Norwegian doctors. However, there were no or only small differences related to depersonalization/cynicism or reduced personal accomplishment, the other two dimensions in Maslach's burnout inventory. Seventy-three percent of the Sana doctors could be in need of treatment for depression or anxiety based on their symptom distress scores, compared with 14% of men and 18% of women doctors in Norway. Twenty-one percent of the Sana doctors had a history of suicidal thoughts, including how to commit the act, as compared to 10% of Norwegian doctors in general. Levels of job stress were also higher in the Sana doctors than in Norwegian doctors in general 2.51 (95% CI 2.42-2.60) vs 2.02 (95% CI 1.99-2.05), p<0.001. There were no significant differences between men and women physicians in the Sana sample regarding levels of emotional exhaustion, mental distress or suicidal thoughts with plans. Women had higher levels of job stress 2.54 (SD 0.77) than men 2.33 (SD 0.66), t=2.18, p=0.03.

Conclusion: Sana doctors displayed a higher degree of emotional exhaustion, symptoms of depression and anxiety as well as job related stress, compared with all Norwegian doctors. This may indicate that the program at Villa Sana to a large extent reaches doctors in need of help. The counselling intervention can help doctors to evaluate their professional and private situation, and, when necessary, enhance motivation for seeking adequate treatment.

5.2 Paper II.

Counselling for burnout in Norwegian doctors: one year cohort study.

Karin E Isaksson Rø, Tore Gude, Reidar Tyssen, Olaf G Aasland. *BMJ* 2008: 337; a2004

Background: We wanted to investigate levels and predictors of change in dimensions of burnout after an intervention for stressed doctors at a Norwegian resource centre.

Methods: 227 doctors, participating in a counselling intervention from 2003-2005, took part in a follow-up study, with self-reporting forms before and soon after the intervention, as well as at one-year follow-up. The counselling - lasting one day (individual) or one week (group based) - aimed at motivating reflection on and acknowledgement of the doctors' situation and personal needs. Main outcome variables were levels of burnout (Maslach burnout inventory), mental distress (SCL5) and job stress and predictors of reduction in emotional exhaustion were investigated by linear regression.

Results: 185 doctors (81%, 88 men and 97 women) completed one year follow-up.

Weekly work hours for the Sana cohort at baseline (43.4 SD 7.90) was not significantly different from that of the representative survey of doctors in 2003 (43.6 SD 8.14) Mann Whitney U p=0.12. There was a significant mean reduction in work hours of 1.6 hours/week (SD 11.4). Men had a higher average number of work hours/week at baseline than women: 45.1 hours (SD 7.58) vs 42.0 hours (SD 7.94), Mann-Whitney U p=0.01. This difference disappeared at follow-up.

The mean level of emotional exhaustion (scale 1-5) was significantly reduced from 3.00 (SD 0.94) to 2.53 (SD 0.76) (t=6.76, P<0.001), similar to the level found in a representative sample of 390 Norwegian doctors. The percentage of "case-ness" on emotional exhaustion was reduced from 45,2% (95% CI 37.7 - 52.7) to 24.4% (95% CI 17.9 - 30.0), p<0.001.

Job stress was reduced from 2.40 (SD 0.70) to 1.97 (SD 0.61), t=8.52, p<0.001, which was significantly lower than for Norwegian doctors.

Mental distress, SCL5, was reduced from 2.84(SD 1.08) to 2.07 (0.92), t=10.73, p<0.001, still significantly higher than in Norwegian doctors.The percentage of "case-ness" on SCL5 was reduced from 72.3% (95% CI 65.8 - 78.8) to 40.3% (95% CI 33.1 - 47.4), p<0.001. There were no differences in reduction of emotional exhaustion, SCL5 or job stress according to gender, route of attendance or coming to one or two interventions during the year.

There was a considerable reduction in the proportion of doctors on full time sick leave, from 35% (63/182) at baseline to 6% (10/182) at follow-up. A higher proportion of

women than men were on full time sick leave at baseline 35/86 (41%, 95% CI 31-51) vs 18/80 (22%, 95% CI 10-26) p=0.01. During the year after the intervention there was an increase in number of weeks on sick leave compared with the year before the intervention 8.0 (SD 13.7) vs 4.0 (SD 6.9), z=3.39, p<0.001. There was a parallel increase in the proportion attending psychotherapy, from 20% (36/182) to 53% (97/182). In the whole cohort, reduction in emotional exhaustion was independently associated with reduction in work hours/week (β=0.17, p=0.03), adjusted for gender, age, and personality dimensions. There were no interaction effects between gender and other significant factors. Among men "satisfaction with the intervention" (β=0.25, p=0.04) independently predicted reduction in emotional exhaustion. There were no differences in age, marital status, reasons for seeking help at Villa Sana, coming to an individual intervention or to an intervention with partner, levels of distress measures (emotional exhaustion, mental distress, job stress), neuroticism, or strategies for ways of coping at baseline between the men who were very satisfied and not so satisfied with the intervention. Being very satisfied did not predict going to therapy, sick leave or reduction in work hours after the intervention.

Conclusions: A short term counselling intervention could contribute to reduction in emotional exhaustion among doctors. The reduction was associated with reduction in working hours for the whole cohort and, among men, was predicted by satisfaction with the intervention.

5.3 Paper III.

A three-year cohort study of the relationships between coping, job stress, and burnout after a counselling intervention for help-seeking physicians.

Karin E Isaksson Ro, Reidar Tyssen, Asle Hoffart, Harold Sexton, Olaf G Aasland, Tore Gude. Submitted.

Background: We lack prospective studies on the impact of change in coping strategies among distressed physicians. The present study aimed to investigate the interplay of personality, stress, ways of coping, and emotional exhaustion in a three-year follow-up after a counselling intervention for burnout.

Methods: 227 physicians who attended a counselling intervention for burnout at the Resource Centre Villa Sana, Norway in 2003-2005, were followed with self-report assessments at baseline, one-year, and three-year follow-up. Main outcome measures were burnout, job stress, coping strategies, and neuroticism. Changes in these measures were analyzed with repeated measures ANOVA. Temporal relationships between changes were examined using structural modeling with cross-lagged and synchronous models and with construction of a path model to describe the interplay.

Results: 184 physicians (81%, 83 men, 101 women) completed the three-year follow-up assessment.

The significantly reduced levels of emotional exhaustion (one dimension of burnout), job stress, and emotion-focused coping strategies from baseline to one year after the intervention, were maintained to three-year follow-up. The number of weeks on sick leave during the past year was significantly lower at three-year follow-up compared with baseline 2.5 (SD 8.3) vs 4.0 (SD 6.9) z=3.7, p<0.001 (and thus much lower than at one-year follow-up). There was no significant difference in proportion of respondents on present sick leave at three-year follow up compared with at one-year follow-up.

Neuroticism was reduced significantly from baseline to three-year follow-up, ANOVA F(df2) =10.1, p<0.001 with a near-significant change from baseline – one-year F(df1)=3.6, p=0.06 and significantly from one-year to three-year follow-up F(df1)=6.7. p=0.01.

Panel modeling indicated that changes in emotion-focused coping (z= 4.05, p<0.001), job stress (z=3.16, p=0.003), and active coping (z=-3.32, p=0.002) preceded changes in emotional exhaustion. The path model confirmed the indication of this interplay as reduction in job stress (standardized path coefficient (r) =.50) and reduction in emotion-focused coping (r=.42) preceded the reduction in emotional exhaustion.

Physicians who received psychotherapy the first year after the intervention (n=89) reported higher baseline levels of emotional exhaustion (3.17 SD 0.89 vs. 2.85 SD 0.97, t=2.29, p=0.02) and neuroticism (2.91 SD 1.80 vs. 2.34 SD 1.78, t= 2.17, p=0.03) than the rest of the cohort (n=95). However, there were no significant differences in coping strategies or job stress at baseline. The two groups had a similar overall change in emotion-focused coping over the three-year period. There was, however, a significant interaction between time and change in emotion-focused coping $F(2,318)=4.54$, $p=0.01$. The repeated contrast indicated significant interactions both from baseline to one-year $F(1,159)=4.96$, $p=0.03$ and from one- to three-year follow-up $F(1,159)=8.90$, $p=0.003$. Repeated measures ANOVA was done for each group. The group in therapy had some reduction in emotion-focused coping during the first year of follow-up $F(1,87)=5.06$, $p=0.03$ and more from one to three years $F(1,87)=8.94$, $p=0.004$. The group without therapy had a reduction from baseline to one year $F(1,72) = 33.6$, $p<0.001$, but no further reduction from one to three years $F(1,72)=0.67$, ns.

Conclusion: Reduction in emotion-focused coping and job stress had direct effects on reduction in emotional exhaustion. These results indicate that coping strategies and job stress could be important foci in intervention programs that aim to reduce or prevent burnout in help-seeking physicians. The role of therapy for change in coping strategies should be further investigated.

6.0 General discussion:

6.1 Levels and course of distress and related variables.

Levels of distress at baseline.

The group of physicians coming to Villa Sana had significantly higher levels of distress than representative groups of Norwegian physicians, both regarding emotional exhaustion, job stress and mental distress. The higher levels of distress were partly expected as the Villa Sana programs were designed for potentially burdened and exhausted physicians in order to prevent further development towards the serious conditions and states of decompensation seen in physicians that had previously been admitted to the psychiatric hospital, Modum Bad [101]. When planning the Villa Sana program, there was, however, an uncertainty regarding whether distressed physicians would use such a facility. Their high expectations and demands to own capacity and ability to cope [33,144], combined with a low awareness and acceptance of personal needs has contributed to reluctance among physicians to seek help, especially for mental distress, as discussed above [26,87]. As described in other studies, factors like confidentiality and accessability could facilitate help-seeking [100,103]. The easy access to the Villa Sana programs, the confidentiality due to medical records not being taken, and the programs being specifically designed for physicians and paid for by their own organization and thus "encouraging" the use of them, probably contributed to lower the threshold for help-seeking. Studies of physician-specific treatment programs in the US have shown that many of the physicians needed a prompting to seek help [92-94]. In line with this, 37% of the physicians reported that they had been prompted to seek help and an additional 10% were referred to this potentially easily accessible, counselling intervention. Together with the relatively high levels of distress, this indicates that the interventions reached physicians in need of help - with levels of distress that might have influenced their work and/or social life.

Although the levels of emotional exhaustion were higher than among Norwegian physicians, the level of cynicism did not differ between the physicians at Villa Sana and Norwegian physicians. Personal accomplishment was significantly lower in the Sana sample than among Norwegian physicians, but the difference was numerically small. As discussed earlier the development of cynicism has been seen as a consequence and a way to protect oneself from emotional exhaustion, while reduced personal accomplishment has a more uncertain relationship to the other two dimensions [36]. The results could indicate that

physicians came to Villa Sana at a relatively early stage in the burnout process, when cynicism and reduction in personal accomplishment were not too far developed, and thus with the potential to stop the development of burnout. On the other hand, it is possible that physicians who do not develop cynicism as a defence against exhaustion, are those who stay working, even with considerable distress, in order to fulfil their obligations, and thus have a higher risk of becoming exhausted than those who develop a measure of cynicism. This could strenghten the assumption that burnout can manifest itself differently in different individuals [38].

Women coming to Villa Sana did not have higher levels of emotional exhaustion or mental distress than men, whereas somewhat higher levels of perceived job stress. Although referred studies indicate that women physicians have a higher prevalence of burnout or depressive symptoms than male physicians [33,48,52,53,58], they have not been found to have a higher degree of help-seeking than men [95,103]. These help-seeking studies however, refer mainly to younger physicians, whereas there are indications of increasing mental distress with age among women physicians, at least in the United Kingdom [52]. This might explain the higher proportion of women at Villa Sana, with their mean age of 44. The issue of confidentiality could also be more important for women than for men [26], and there is reason to believe that Villa Sana has been experienced as a more confidential setting than ordinary psychiatric treatment.

Distress levels, need for treatment, and factors indicating treatment post-intervention.

Levels of emotional exhaustion are difficult to relate directly to a clinical state in the individual, since the definition of burnout was arbitrarily based on a cohort of physicians, and not recommended to use individually [39]. Similarly the cut-off value proposed for Norwegian physicians, based on a five-point intensity scale [17], had an unsure clinical significance. The physicians scoring above cut-off were, however, found to have significantly higher scores on the other distress measures (mental distress, job stress), neuroticism, and for emotion-focused ways of coping, and being above cut-off predicted significantly more weeks on sick leave after the intervention. There are thus indications that scoring above cut-off on emotional exhaustion, which 49% of the physicians coming to Villa Sana did, indicates a relatively high levels of distress and could be related to a need for treatment.

The potential need for treatment in this cohort is supported by the high levels of mental distress found in the physician cohort, indicating that 73% of the physicians coming

to Villa Sana could be in need of treatment for depressive or anxious symptoms, compared with 14% among men and 18% among women among Norwegian physicians in general. Even when using a higher cut-off on SCL5, as discussed in the Methods section, the proportion of physicians in potential need of treatment is relatively high. This is underscored by 21% of the Sana- physicians reporting serious suicidal thoughts with plans for how to commit suicide (lifetime perspective) compared with 10% among all Norwegian physicians. The prevalence and severity of symptoms in physicians coming to Villa Sana were similar to those measured among patients in an English psychiatric specialist service for physicians [145], which further underscores the importance of treatment within this group.

In accordance with the high levels of distress, more than half of the physicians sought psychotherapy after the intervention. The significant degree of post-intervention increase in seeking psychotherapy compared with baseline-data could indicate increased acknowledgement (possibly perception) and acceptance of own needs among the physicians coming to Villa Sana. This is in line with a study finding that perceived high levels of emotional distress were found to predict professional help-seeking among physicians [95]. The reduction in emotion-focused coping could have contributed to a gradual acceptance of one´s own needs instead of blaming oneself for having those needs or wishful thinking about a change in the situation. An Australian study has indicated the possibility of coping strategies being a mediator between interventions and improved stress outcomes [84]. No significant changes, however, were found in the proportion of physicians consulting general practitioners or in the use of antidepressants, although such advice also was given. The intervention at Villa Sana could have been a model for a psychotherapy setting, thus lowering the threshold specifically for seeking such treatment.

With an individualized intervention, such as within the Villa Sana programs, the directly work-related aspects were not as accessible as if the intervention had been work-place based. As burnout is defined as a reaction to a work-related situation, it is important to not only individualize the interventions for burnout, but to also approach them in the interface between the individual and the working place [115,146]. The reduction of work hours points to changes having been implemented in the work situation. As will be discussed below, reduction in work hours predicted reduction in emotional exhaustion.

Number of weeks on sick leave increased during the follow-up year compared with the year before the intervention. The acknowledgement of need for treatment would often include an acknowledgement of need for time to pursue treatment and sometimes the need

for rest in a state of exhaustion. This is important, since previous studies of sick leave among physicians have indicated that the rate of sick leave could be too low, and that physicians could need more withdrawal from their distressing context [22,24,25]. At three-year follow-up the number of weeks on sick-leave during the preceding year was lower than at baseline. In agreement with this at one-year follow-up, the proportion of physicians on sick-leave was considerably reduced compared with baseline, and these levels were sustained at three-year follow-up. Although there was a reduction in weekly work hours, the change in rate of sick leave supports the notion that the working capacity of the physicians largely was restored at one-year follow-up. The state of distress thus seems to have been reversible, and indicates that there has not been a development towards more serious de-compensation.

Perceived reasons for seeking help.

Both men and women physicians came to Villa Sana mainly because of reasons concerning problems with health and life quality and exhaustion/burnout. This is as expected in relation to the aims and reasons for implementing the intervention.

Men physicians, more often than women, related their reasons for coming to their private situation, whereas women more often than men related their reasons for coming to a feeling of exhaustion and burnout. In two fairly recent studies of Scandinavian physicians, levels of work-related stress were found to be similar among men and women [65,147]. Both men and women had high levels of stress at work, but after work (when coming home) stress levels seemed to be maintained on a high level among women but not among men [147]. Male physicians, in some studies, more often reported to have partners with part-time work and more often organized their family lives to enable time to be devoted to their medical career than women did [147,148]. With this background, it is possible that experienced distress among male physicians could be attributed to a dysfunctional private life (interfering with work obligations), and that women could attribute their distress to the total situation. A recent study has shown that work home interface stress increased burnout, while burnout also increased work home interface stress, demonstrating a reciprocal association [69]. In accordance with this, the clinical experience from the Villa Sana program is that the sum of stress, both in private and at work, was important to explore, even when the reason for coming was attributed to only one of these initially. The possibility for physicians to attend counselling sessions together with their spouse enhanced

the possibility of addressing work-home interface related stress and emphasized the importance of this aspect in physician distress.

Among the younger physicians, the prevalence of problems with professional identity was an important reason for help-seeking. Uncertainty relating to role understanding and role issues are known to be associated with burnout. Role ambiguity in the form of thoughts of changing career, especially among young physicians [11], has been shown to increase burnout, whereas satisfaction with career, indicating less role ambiguity, showed a strong inverse relationship to burnout [18]. The questions around professional identity could be related to intra-role conflicts, coming from an inherent tension between performing the roles of being both of a physician and a trainee [86], as well as more general role conflicts associated with organizational changes in the health care systems [85].

Course of distress through three years of follow-up.

The level of emotional exhaustion was reduced to a level equivalent with the average for Norwegian physicians and job stress to an average level significantly lower than for Norwegian physicians in general. Mental distress was also reduced, but was still significantly higher than for Norwegian physicians at one-year as well as at three-year follow-up. Generally, the reduction in distress is in accordance with previous studies of interventions for distress among physicians, where reductions in different distress measures have been found post-intervention [84,109,112,113,116,117]. Previous prevention studies have mainly had short-term follow-up, but a few studies with longer follow-up indicate that a rebound effect could have been expected on the distress measures over time [70,114]. In our study, however, there was a stabilization of the measures from one- to three-year follow-up. This result is promising in relation to the possibility of not only preventing a deterioration of distress in physicians, but actually seeing an improvement that is stable over time.

How can levels and course of distress in physicians from this study be generalized?

As discussed under Methods, the results from this study are probably generalisable to the whole group of physicians seeking help at Villa Sana. A high percentage of the consecutive sample of physicians coming to the program during the two-year period agreed to participate and there was a high response rate both at one- and three-year follow-up. Although the distribution of specialties at Villa Sana was proportionally similar to Norwegian physicians in general, we had indications that young doctors knew less about the

intervention programs than their older colleagues, and that the interventions were more unknown to physicians in some parts of the country [121]. This gives an uncertainty to whether the results can be generalized to the whole group of physicians who would seek help for burnout or mental health problems in Norway. Since we have a relatively selected sample of women and of general practitioners, the results could be more generalisable to these groups.

It is also important to investigate whether the results are specific for physicians, or whether other health care workers could demonstrate a similar course of distress after a counselling intervention. We had the possibility of comparing the cohort of physicians with a cohort of nurses who attended a week-long course at Villa Sana during approximately the same period (2004-2006) as the physicians, and who have been followed up for one year after the intervention [149]. A similar reduction in emotional exhaustion was found among the nurses as among the physicians, indicating that such reduction was not profession-specific for physicians. We found, however, that being in a conflict at work during follow-up was associated with less reduction in emotional exhaustion among nurses [149]. This was not the case, either among the whole cohort of physicians or among women physicians (the nurse sample consisted of 97% women), although the level of work related conflicts did not differ significantly between the groups (data not shown). Different types of conflict can be inherent in the nursing role [150-153], and many nurses probably have more limited possibility of controlling or restricting their interactive arenas when at work than physicians have, and would thus be more vulnerable for ongoing conflicts [154,155]. This indicates that some issues, important to address in a counselling intervention, can be profession-specific.

6.2 Factors associated with changes in emotional exhaustion.

The reduction in distress levels, followed by the sustainment of lower levels, which were found also for emotional exhaustion over time, emphasizes the importance of examining which factors that could be associated with such a reduction.

Work hours.

Reduction of work hours among physicians coming to Villa Sana was found to be associated with reduction in emotional exhaustion at one-year follow-up. When examining

the relationship between work hours and perceived stress, or with development of burnout, most of the studies have not shown a clear relationship between number of work hours and these outcomes [51,67,156], whereas the reduction of work hours, in connection with enforcement of new work hour regulations in 2003 (to below 80 hours/week), was associated with reduction in emotional exhaustion among US residents [12,13,71]. As shown in these studies, work hours in the US, however, were and still are, on average much longer than in Norway, and than in the Villa Sana cohort. It is thus interesting that physicians also in our cohort obtained a reduction in emotional exhaustion with a reduction in work hours. A potential mediator between work hours and burnout has been suggested to be the "fit" – defined as "the extent to which workers realize their plans for optimizing their own work- and non-work needs" [157]. Fit will necessarily be influenced by the norms of the surrounding society, and this could explain the positive impact of reduced number of work hours both in the US and in the present study, despite the difference in total hours.

When running regression analyses for each gender among physicians, we found that a reduction in work hours was significantly associated with a reduction in emotional exhaustion among men, but not among women. A tentative interpretation of this could be the gender differences in stress as discussed above [147,148]. Since stress levels for men, according to some studies, could be influenced mainly by the work situation, reduction in work hours could have a more direct influence on emotional exhaustion among men than among women physicians [148]. Women seem to experience and value social support more than men, both at work and at home, and social support seems to buffer experienced stress [65]. The group settings at Villa Sana could enhance perceived social support, and be a model for securing support in the local work setting, by lowering the threshold for talking to colleagues about difficulties. This is supported by anecdotal evidence from previous participants at Villa Sana, and could be an important dimension for reduction in emotional exhaustion especially for women physicians. Variables to measure these dimensions were not included in this study, but should be included in future studies.

Satisfaction with the intervention.

Among men physicians, satisfaction with the intervention, specifically that the counselling session corresponded to their expectations (and expectations were generally high), was found to predict reduction in emotional exhaustion at one-year follow-up. A comparison of several variables at baseline and during follow-up did not show clear

differences between the satisfied and the less satisfied men. It would be important to characterize the most satisfied men, in order to define for whom the intervention could be most useful, and a qualitative study of male participants might give more information here.

Emotion-focused coping.

There were indications that reduction in emotion-focused coping in this study preceded reduction in emotional exhaustion. Although previous studies have shown that physicians under stress report more use of active coping strategies than their colleagues [78,79], this study indicated that a reduction in emotion-focused coping strategies, rather than an increase in active coping, gave a reduction in emotional exhaustion. This is in line with studies that have found associations between emotion-focused coping and distress measures/need for mental health treatment [80-82]. Reduction of emotion-focused coping, such as self-blame or wishful thinking, may be a factor that can reduce the risk of relapse in emotional exhaustion with new stress-exposure. The associations between active and emotion-focused coping strategies and their influence on reduction in emotional exhaustion should be investigated further.

The reduction in emotion-focused coping strategies occurred mainly from one- to three-year follow-up among the physicians who attended psychotherapy during the first post-intervention year, whereas it occurred mainly from baseline to one-year follow-up among those who did not attend psychotherapy. The former group was initially more distressed, reporting higher baseline levels of emotional exhaustion and neuroticism, than the rest of the cohort. Our results thus indicate that some physicians can change coping strategies after a short-term intervention (like the intervention at the Resource Centre, Villa Sana), while the most distressed physicians perceived a need for additional psychotherapy, that may have contributed to a reduction in emotion-focused coping, and thus further in burnout. Our findings support previous recommendations of counselling and psychotherapy as primary and secondary preventive interventions for health professionals [158,159], and confirm the findings that cognitive behavioural therapy used in a group of general practitioners promoted changes in coping strategies [84]. Since therapy in this study was self-selected and not randomized, further studies are needed to confirm these potential relationships.

Job stress

Longitudinal studies have previously shown a reciprocal relationship between changes in emotional exhaustion and changes in job stress in normative samples of physicians [68,69], whereas results in this study indicate that a reduction in job stress lead to a reduction in emotional exhaustion and not vice versa. This could imply that the relationship between these parameters is different among physicians with high initial levels of emotional exhaustion, as in the present cohort, compared with physicians in general.

As mentioned above, previous studies have shown a relationship between work-home interface stress and emotional exhaustion [66,67,69]. Consistent with this, we found that a change in social stress (including both work-home interface stress and time pressure) influenced change in emotional exhaustion, whereas change in emotional stress did not. We also found that reduction in stress due to fear of litigation had an influence on reduction in emotional exhaustion.

Focusing on reduction in job stress, especially social job stress and fear of litigation, in combination with reduction of emotion-focused coping strategies, could thus be important aspects of interventions for distressed physicians.

The results from the structural equation modelling indicated that a reduction in emotion-focused coping and job stress influenced reduction in emotional exhaustion. These findings do not necessarily reflect the only possible relationships among these parameters. As stated above, the intervention focused on the use of coping strategies and reduction of stress, and the temporal relationships found might reflect this focus. Also, these changes are found in a group of physicians with initially elevated levels of emotional exhaustion who have decided to seek a counselling intervention and cannot be generalized to all physicians.

6.3 Can changes in distress be related to the intervention?

The design of this study allows us to follow the course of distress in the cohort of physicians that participated in an intervention program at Villa Sana, and to investigate factors that were associated with this course. We cannot infer causal relationships between the intervention and course of distress due to the lack of a controlled design. The association found between experiencing that the intervention corresponded to the expectations with reduction in emotional exhaustion at follow-up, among male physicians, can, however, indicate a relationship between intervention and outcome.

The present study showed that the physicians coming to Villa Sana had high levels of distress compared with Norwegian physicians in general, and that the programs thus reached physicians in need of help. The decision by a physician to contact Villa Sana could mean that a process had been initiated that would lead to a reduction in distress with or without the intervention. The relatively high number of physicians needing prompting to come, however, weighs against this. Additionally, the increase in therapy-seeking after the intervention, the temporary increase in weeks of sick leave during the year after the intervention, the reduction in work hours and coming to a week-long course at Villa Sana as a second intervention (after a primary individual counselling session) could indicate an increased motivation to acknowledge and accept one's own needs in relation to distress levels after the intervention.

To verify these indications of associations between the intervention and outcomes controlled studies are necessary.

7.0. Main results and implications

7.1 Main results

- The cohort of physicians coming to Villa Sana had high levels of distress compared with Norwegian physicians in general, and the levels of both emotional exhaustion and mental distress at baseline indicated that many of the physicians in our sample were in need of treatment. The interventions thus seem to have reached a target group.

- Problems in relation to exhaustion/burnout and health and life quality were important reasons for coming to Villa Sana. Men, more than women, reported their reasons for coming to be problems with private relations, and younger doctors, more than older, stated problems with professional identity.

- In this cohort of distressed physicians, the level of emotional exhaustion from baseline to one-year follow-up was reduced to a level equivalent to that found in representative samples of Norwegian physicians, while job stress was reduced to a level significantly lower than among Norwegian physicians in general. The level of mental distress was significantly reduced, but not to the normative level. The lower levels were sustained from one- to three-year follow-up. There were no gender differences in reduction of distress.

- There was an increase in the proportion of physicians attending psychotherapy after the intervention. There was also a reduction in the number of work hours/week and a temporary increase in <u>number of weeks on sick leave</u> during the same period compared with the year before the intervention. A substantial reduction was found in <u>proportion</u> of physicians on sick leave at one-year follow-up, compared with baseline, and the reduction was sustained at three-year follow-up.

- Reduction in emotional exhaustion was found to be associated with reduction in work hours, and among men, post-intervention satisfaction predicted reduction in emotional exhaustion at one-year follow-up. .

- Reduction in emotion-focused coping and in job stress – particularly job stress associated with social stressors (time pressure and work-home interaction) and fear of litigation – were found to have an impact on reduction in emotional exhaustion.

- The results indicate that post-intervention psychotherapy could contribute to a reduction in emotion-focused coping strategies among the most distressed

physicians.

7.2. Clinical implications

- The reduction and long-term sustainment of distress levels after a counselling intervention for distressed physicians is promising in face of the relatively high prevalence of burnout and mental distress within this profession, and the negative consequences this may have for patient care as well as for the individual physician.
- An easily accessible, low threshold counselling intervention program, ensuring the necessary confidentiality, may reach physicians in need, and could motivate physicians to seek help.
- The results indicate that a counselling intervention for physicians may be conducive towards acknowledging and accepting their own needs in relation to high levels of distress, inducing steps to be taken after the intervention, like seeking psychotherapy, getting a period of sick leave and reducing work hours.
- Focusing on coping strategies, and especially emotion-focused coping strategies, could be an important strategy for reduction in emotional exhaustion for the individual physician.
- There are several results in this study underscoring the importance of addressing the work situation in relation to distress in physicians. The problems physicians experience in relation to professional identity, the association between reduction in work hours and reduction in emotional exhaustion, as well as the association found between reduction in levels of job stress having an impact on reduction in emotional exhaustion, should all encourage work-place-based interventions.

7.3 Research implications:

- To study the possible association between an improvement in distress measures and the counselling intervention, more sophisticated study designs are needed. A program evaluation with pre-, post and follow-up assessments could indicate whether the outcomes studied at follow-up occur in relation to the intervention. A randomized controlled design, for example using different types of interventions, could investigate causal changes between intervention factors and outcome measures.

- Our results indicated that among men physicians, those who were most satisfied with the intervention obtained most reduction in emotional exhaustion. Further research should investigate whether pre-intervention factors can predict any effect. A qualitative approach might identify such factors.
- To determine factors associated with the reduction in emotional exhaustion found among women physicians, there is a need to explore factors not assessed in this study. Factors related to social support, and more specific factors related to work-home interface stress, should be studied for both genders.
- Emotion-focused coping seems to be amenable to change and to have importance for reduction in emotional exhaustion. Both the relationship between coping strategies and reduction in emotional exhaustion, as well as the role of psychotherapy for reduction in emotion-focused coping among distressed physicians should be further investigated.
- The results in this study point to the need for both work-place and work-home related interventions for distressed physicians, and studies with combinations of person- and organization-directed interventions are important to pursue.

References

1. Greene G. A burnt-out case. Harmondsworth, England: Penguin books ltd; 1960.

2. Schaufeli WB, Enzmann D. The Burnout Companion to study and practice. Taylor and Francis Ltd. London: 1998.

3. Partridge E. A dictionary of slang and unconventional English. Routledge and Kegan Paul. London; 1961.

4. Freudenberger HJ. Staff burn-out**.** Journal of Social Issues 1974;30**:**159-65.

5. Maslach C, Jackson SE. The measurement of experienced burnout. Journal of Occupational Behavior 1981;2**:**99-113.

6. Matthiesen SB. Utbrenthet i det moderne - en oversikt. In Burntout. Utbrent. Krevende jobber - gode liv? Edited by Roness A, Matthiesen SB. 3rd edition. Fagbokforlaget. Bergen. 2002:20-56.

7. Tungesvik HO. Vekst gjennom kriser**.** In Utbrent. Krevende jobber - gode liv? 3rd edition. Edited by Roness A, Matthiesen SB. Fagbokforlaget.Bergen. 2002:233-43.

8. Nygren A, Asberg M, Jensen I, Vingard E, Nathell L, Lisspers J. Eriksson S, Magnussion S. Vetenskaplig utvärdering av prevention och rehabilitering vid långvarig ohälsa. Institusjonen för klinisk neurovetenskap, sektionerna för pesonskadeprevention resp. psykiatri. Institutionen för omvårdnad. Karolinska Institutet, Stockholm.2001: 29-36

9. Grassi L, Magnani K. Psychiatric morbidity and burnout in the medical profession: an Italian study of general practitioners and hospital physicians. Psychotherapy & Psychosomatics 2000; 69(6):329-34

10. Olkinuora M, Asp S, Juntunen J, Kauttu K, Strid L, Aarimaa M. Stress symptoms, burnout and suicidal thoughts in Finnish physicians. Social Psychiatry & Psychiatric Epidemiology 1990; 25(2):81-6,.

11. Toyry S. Burnout and self-reported health among finnish physicians. Kuopio university publications d. Medical Sciences 2005;365.

12. Gopal R, Glasheen JJ, Miyoshi TJ, Prochazka AV. Burnout and internal medicine resident work-hour restrictions. Arch Intern Med 2005; 65:2595-600.

13. Goitein L, Shanafelt TD, Wipf JE, Slatore CG, Back AL. The effects of work-hour limitations on resident well-being, patient care, and education in an internal medicine residency program. Arch Intern Med 2005; 165: 2601-6.

14. Kirwan M, Armstrong D. Investigation of burnout in a sample of British general practitioners. Br J Gen Pract 1995; 45: 259-60.

15. Kluger MT, Townend K, Laidlaw T. Job satisfaction, stress and burnout in Australian specialist anaesthetists. Anaesthesia 2003; 58:339-45.

16. Prins JT, Hoekstra-Weebers J, van de Wiel HBM, Gazendam-Donofrio SM, Sprangers F, Jaspers FCA, van der Heijden FMMA. Burnout among Dutch medical residents. The international journal of behavioral medicine 2007; 14:119-25.

17. Falkum E. Hva er utbrenthet?. Tidsskrift for Den Norske Laegeforening 2000;120(10):1122-8.

18. Shanafelt TD, Bradley KA, Wipf JE, Back AL. Burnout and self-reported patient care in an internal medicine residency program. Ann Intern Med 2002;136:358-67.

19. West CP, Huschka MM, Novotny PJ, Sloan JA, Kolars JC, Habermann TM, Shanafelt TD. Association of perceived medical errors with resident distress and empathy: a prospective longitudinal study. *JAMA* 2006; 296:1071-8.

20. Firth-Cozens J, Greenhalgh J. Doctors' perceptions of the links between stress and lowered clinical care. Social Science & Medicine 1997; 44(7):1017-22.

21. Fahrenkopf AM, Sectish TC, Barger LK, Sharek PJ, Lewin D, Chiang VW, Edwards S, Wiedermann BL, Landrigan CP. Rates of medication errors among depressed and burnt out residents: prospective cohort study. BMJ 2008;336: 488-91.

22. Rosvold EO, Bjertness E. Physicians who do not take sick leave: hazardous heroes? Scandinavian Journal of Public Health 2001;29(1):71-5.

23. Toyry S, Rasanen K, Kujala S, Aarimaa M, Juntunen J, Kalimo R, Luthala R, Makela P, Myllymaki K, Seuri M, Husman K. Self-reported health, illness, and self-care among finnish physicians: a national survey. Archives of Family Medicine 2000; 9(10):1079-85.

24. Thompson WT, Cupples ME, Sibbett CH, Skan DI, Bradley T. Challenge of culture, conscience, and contract to general practitioners' care of their own health: qualitative study. BMJ 2001; 323:728-31.

25. Kivimaki M, Sutinen R, Elovainio M, Vahtera J, Rasanen K, Toyry S, Ferrie JK, Firth-Cozens J. Sickness absence in hospital physicians: 2 year follow up study on determinants. Occupational & Environmental Medicine 2001;58(6):361-6.

26. Davidson SK, Schattner PL. Doctors' health-seeking behaviour: a questionnaire survey. Med J Aust 2003; 179:302-5.

27. Taylor C, Graham J, Potts HW, Richards MA, Ramirez AJ. Changes in mental health of UK hospital consultants since the mid-1990s. Lancet 2005;366(9487):742-4.

28. Falkum E, Gjerberg E, Hofoss D, Aasland OG. Tidspress blant norske leger. Tidsskrift for Den Norske Laegeforening 1997;117(7):954-9.

29. Tyssen R, Vaglum P, Gronvold NT, Ekeberg O. The impact of job stress and working conditions on mental health problems among junior house officers. A nationwide Norwegian prospective cohort study. Medical Education 2000;34(5):374-84.

30. McMurray JE, Williams E, Schwartz MD, Douglas J, Van KJ, Konrad TR, Gerrity M, Bigby JA, Linzer M. Physician job satisfaction: developing a model using qualitative data. SGIM Career Satisfaction Study Group. J Gen Intern Med 1997; 12:711-4.

31. Arnetz BB. Psychosocial challenges facing physicians of today. Soc Sci Med 2001; 52:203-13.

32. Aasland OG, Forde R. Legers faglige ytringsfrihet. Tidsskr Nor Laegeforen 2008; 128:1838-40.

33. Firth-Cozens J. Depression in doctors. In Depression and physical illness. Edited by Robertson MM, Katona CLE. John Wiley & Sons Ltd. New York 1997:95-111.

34. Caplan RP. Stress, anxiety, and depression in hospital consultants, general practitioners, and senior health service managers. BMJ 1994;309:1261-3.

35. Schernhammer ES, Colditz GA. Suicide rates among physicians: a quantitative and gender assessment (meta-analysis). Am J Psychiatry 2004; 161: 2295-302.

36. Schaufeli WB, Buunk B.P. Burnout: An overview of 25 years of research and theorizing. In The handbook of work and health psychology. Second edition. Edited by Schabracq MJ, Winnubst JAM, Cooper CL.: John Wiley and son.Ltd. Chichester 2003:383-425.

37. Hallsten L, Josephson M, Torgén M. Performance-based self-esteem. A driving force in burnout processes and its assessment. Arbete och Hälsa from National Institute for Working Life, Stockholm 2005:4.

38. Dyrbye LN, West CP, Shanafelt TD. Defining burnout as a dichotomous variable. J Gen Intern Med 2009; 24: 440.

39. Maslach C, Schaufeli WB, Leiter MP. Maslach Burnout Inventory. Manual, 3rd edition. Consulting Psychologists Press; 1996.

40. Peterson U, Bergstrom G, Samuelsson M, Asberg M, Nygren A. Reflecting peer-support groups in the prevention of stress and burnout: randomized controlled trial. J Adv Nurs 2008; 63:506-16.

41. Dahlin M, Joneborg N, Runeson B. Performance-based self-esteem and burnout in a cross-sectional study of medical students. Med Teach 2007; 29:43-8.

42. Kristensen TS, Borritz M, Villadsen E, Christensen KB. The Copenhagen Burnout Inventory: A new tool for the assessment of burnout. Work and Stress 2005; 19:192-207.

43. Martini S, Arfken CL, Balon R. Comparison of burnout among medical residents before and after the implementation of work hours limits. Academic Psychiatry 2006; 30:352-5.

44. Deckard G, Meterko M, Field D. Physician burnout: an examination of personal, professional, and organizational relationships. Med Care 1994; 32:745-54.

45. Ramirez AJ, Graham J, Richards MA, Cull A, Gregory WM. Mental health of hospital consultants: the effects of stress and satisfaction at work.Lancet 1996;347:724-8.

46. Schaufeli WB, Bakker AB, Hoogduin K, Schaap C, Kladler A. On the clinical validity of the Maslach Burnout Inventory and the Burnout Measure. Psychology and health 2001; 16:565-82.

47. Aasland OG, Olff M, Falkum E, Schweder T, Ursin H. Health complaints and job stress in Norwegian physicians: the use of an overlapping questionnaire design. Social Science & Medicine 1997;45(11):1615-29.

48. McMurray JE, Linzer M, Konrad TR, Douglas J, Shugerman R, Nelson K. The work lives of women physicians results from the physician work life study. The SGIM Career Satisfaction Study Group. J Gen Intern Med 2000; 15:372-80.

49. Glass DC, McKnight JD. Perceived control, depressive symptomatology, and professional burnout: a review of the evidence. Psychology and health 1996; 11: 23-48.

50. Glass DC, McKnight JD, Valdimarsdottir H. Depression, burnout, and perceptions of control in hospital nurses. Journal of Consulting & Clinical Psychology 1993; 61:147-55.

51. Tyssen R. Health problems and the use of health services among physicians: a review article with particular emphasis on Norwegian studies. Ind Health 2007; 45:599-610.

52. Wall TD, Bolden RI, Borrill CS, Carter AJ, Golya DA, Hardy GE, Haynes CE, Rick JE, Shapiro DA, West MA. Minor psychiatric disorder in NHS trust staff: occupational and gender differences. British Journal of Psychiatry 1997;171:519-23.

53. Vaglum P, Falkum E. Self-criticism, dependency and depressive symptoms in a nationwide sample of Norwegian physicians. Journal of Affective Disorders 1999; 52(1-3):153-9.

54. Kringlen E, Torgersen S, Cramer V. Mental illness in a rural area: a Norwegian psychiatric epidemiological study. Social Psychiatry & Psychiatric Epidemiology 2006, 41: 713-9.

55. Hem E, Haldorsen T, Aasland OG, Tyssen R, Vaglum P, Ekeberg O. Suicide rates according to education with a particular focus on physicians in Norway 1960-2000. Psychological Medicine 2005; 35(6):873-80.

56. Dyrbye LN, Thomas MR, Massie FS, Power DV, Eacker A, Harper W, Durning S, Moutier C, Szydlo DW, Novotny PJ, Sloan JA, Shanafelt TD. Burnout and suicidal ideation among U.S. medical students. Ann Intern Med 2008; 149**:**334-41.

57. Tyssen R, Hem E, Vaglum P, Gronvold NT, Ekeberg O. The process of suicidal planning among medical doctors: predictors in a longitudinal Norwegian sample. Journal of Affective Disorders 2004;80(2-3):191-8.

58. Hsu K, Marshall V. Prevalence of depression and distress in a large sample of Canadian residents, interns, and fellows. American Journal of Psychiatry 1987; 144(12):1561-6.

59. Firth-Cozens J. Emotional distress in junior house officers. British Medical Journal Clinical Research Ed 1987; 295:533-6.

60. Tyssen R, Vaglum P, Aasland OG, Gronvold NT, Ekeberg O. Use of alcohol to cope with tension, and its relation to gender, years in medical school and hazardous

drinking: a study of two nation-wide Norwegian samples of medical students. Addiction 1998; 93(9):1341-9.

61. Tyssen R, Vaglum P, Gronvold NT, Ekeberg O. Suicidal ideation among medical students and young physicians: a nationwide and prospective study of prevalence and predictors. Journal of Affective Disorders 2001; 64(1):69-79.

62. Buddeberg-Fischer B, Klaghofer R, Stamm M, Siegrist J, Buddeberg C. Work stress and reduced health in young physicians: prospective evidence from Swiss residents. International Archives of Occupational & Environmental Health 2008; 82:31-8.

63. Edwards N, Kornacki MJ, Silversin J. Unhappy doctors: what are the causes and what can be done? BMJ 2002, 324: 835-8.

64. Cooper CL, Rout U, Faragher B. Mental health, job satisfaction, and job stress among general practitioners. BMJ 1989; 298(6670):366-70.

65. Rovik JO, Tyssen R, Hem E, Gude T, Ekeberg O, Moum T, Vaglum P. Job stress in young physicians with an emphasis on the work-home interface: a nine-year, nationwide and longitudinal study of its course and predictors. Ind Health 2007; 45: 662-71.

66. Linzer M, Visser MR, Oort FJ, Smets EM, McMurray JE, de Haes HC, Society of General Internal Medicine (SGIM), Career Satisfaction Study Group (CSSG). Predicting and preventing physician burnout: results from the United States and the Netherlands. Am J Med 2001; 111: 170-5.

67. Visser MR, Smets EM, Oort FJ, de Haes HC. Stress, satisfaction and burnout among Dutch medical specialists. Canadian Medical Association Journal 2003;168: 271-5.

68. McManus IC, Winder BC, Gordon D. The causal links between stress and burnout in a longitudinal study of UK doctors. Lancet 2002; 359: 2089-90.

69. Innstrand ST, Langballe EM, Espnes GA, Falkum E, Aasland OG. Positive and negative work-family interaction and burnout:A longitudinal study of reciprocal relations. Work and Stress 2008; 22:1-15.

70. Barrack RL, Miller LS, Sotile WM, Sotile MO, Rubash HE. Effect of duty hour standards on burnout among orthopaedic surgery residents. Clin Orthop 2006; 449: 134-7.

71. Hutter MM, Kellogg KC, Ferguson CM, Abbott WM, Warshaw AL. The impact of the 80-hour resident workweek on surgical residents and attending surgeons. Ann Surg 2006; 243: 864-71.

72. Deary IJ, Blenkin H, Agius RM, Endler NS, Zealley H, Wood R. Models of job-related stress and personal achievement among consultant doctors. Br J Psychol 1996; 87: 3-29.

73. McCranie EW, Brandsma JM. Personality antecedents of burnout among middle-aged physicians. Behav Med 1988; 14:30-6.

74. McManus IC, Keeling A, Paice E. Stress, burnout and doctors' attitudes to work are determined by personality and learning style: a twelve year longitudinal study of UK medical graduates. BMC Medicine 2004; 2:29.

75. Depue RA, Monroe SM. Conceptualization and measurement of human disorder in life stress research: the problem of chronic disturbance. Psychol Bull 1986; 99:36-51.

76. Eysenck HJ, Eysenck SBG. Manual of the Eysenck personality questionnaire. Hodder and Stoughton. London 1975.

77. Folkman S, Lazarus RS. An analysis of coping in a middle-aged community sample. J Health Soc Behav 1980; 21:219-39.

78. Martin CA, Wilson JF, Fiebelman ND, III, Gurley DN, Miller TW. Physicians' psychologic reactions to malpractice litigation. South Med J 1991; 84:1300-4.

79. Post DM, Weddington WH. Stress and coping of the African-American physician. J Natl Med Assoc 2000; 92:70-5.

80. Vitaliano PP, Russo J, Carr JE, Maiuro RD, Becker J. The ways of coping checklist: revision and psychometric properties. Multivariate Behavioral Research 1985; 20:3-26.

81. Tyssen R, Vaglum P, Gronvold NT, Ekeberg O. Factors in medical school that predict postgraduate mental health problems in need of treatment. A nationwide and longitudinal study. Medical Education 2001:35(2):110-20.

82. Weiniger CF, Shalev AY, Ofek H, Freedman S, Weissman C, Einav S. Posttraumatic stress disorder among hospital surgical physicians exposed to victims of terror: a prospective, controlled questionnaire survey. J Clin Psychiatry 2006; 67:890-6.

83. Sharma A, Sharp DM, Walker LG, Monson JR. Stress and burnout among colorectal surgeons and colorectal nurse specialists working in the National Health Service. Colorectal Disease 2008; 10:397-406.

84. Gardiner M, Lovell G, Williamson P. Physician you can heal yourself! Cognitive behavioural training reduces stress in GPs. Fam Pract 2004; 21:545-51.

85. Peiró JM, Gonzalez-Roma V, Tordera N, Manas MA. Does role stress predict burnout over time among health care professionals? Psychology and health 2001; 16: 511-25.

86. Schaufeli WB, Bakker AB, Frank MMA, Van der Heijden BI, Prins JT. Workaholism, burnout and well-being among junior doctors: The mediating role of role conflict. Work and Stress 2009; 23: 155-72.

87. King MB, Cockcroft A, Gooch C. Emotional distress in doctors: sources, effects and help sought. J R Soc Med 1992; 85: 605-8.

88. Firth-Cozens J. Interventions to improve physicians' well-being and patient care. Social Science & Medicine 2001; 52(2):215-22.

89. Davis DA, Mazmanian PE, Fordis M, Van Harrison R, Thorpe KE, Perrier L. Accuracy of physician self-assessment compared with observed measures of competence: a systematic review. JAMA 2006;296:1094-1102.

90. Borritz M, Bultmann U, Rugulies R, Christensen KB, Villadsen E, Kristensen TS. Psychosocial work characteristics as predictors for burnout: findings from 3-year follow up of the PUMA Study. J Occup Environ Med 2005; 47:1015-25.

91. Langballe EM. Burnout and work-related sickness absence: A longitudinal study among seven different occupational groups in Norway in Burnout in modern work life: concept and consequences. Examined in different occupational groups in Norway. Department of Psychology, Faculty of Social Sciences, University of Oslo; 2008.

92. Sivertz K. When physicians need admission to a psychiatric unit. BC Medical Journal 1998; 40:156-8.

93. Centrella M. Physician addiction and impairment--current thinking: a review. Journal of Addictive Diseases 1994; 13(1):91-105.

94. Nelson HD, Matthews AM, Girard DE, Bloom JD. Substance-impaired physicians probationary and voluntary treatment programs compared. West J Med 1996; 165:31-6.

95. Tyssen R, Rovik JO, Vaglum P, Gronvold NT, Ekeberg O. Help-seeking for mental health problems among young physicians: is it the most ill that seeks help? - A longitudinal and nationwide study. Social Psychiatry & Psychiatric Epidemiology 2004; 39(12):989-93.

96. McKevitt C, Morgan M, Dundas R, Holland WW. Sickness absence and 'working through' illness: a comparison of two professional groups. J Public Health Med 1997; 19: 295-300.

97. Ingstad B, Christie VM. Encounters with illness: the perspective of the sick doctor. Anthropology & Medicine 2001; 8: 201-10.

98. Tyssen R. Lege-pasient-forholdet når pasienten også er lege. Review. Tidsskrift for Den Norske Laegeforening 2001; 121(30):3533-5.

99. Aasland OG. Hospital modernista. Tidsskrift for Den Norske Laegeforening 2001; 121(30):3638-9.

100. Lusilla P, Gual A, Roncero C, Bruguera E, Marcos V, Valero S, Casas M. Dual diagnosis in inpatient physicians: prevalence and clinical characteristics. Mental health and substance use: dual diagnosis 2008; 1:10-20.

101. Roness A, Kaldestad E. Psykiske lidelser hos leger innlagt i en psykiatrisk klinikk. Tidsskr Nor Laegeforen 1991; 111:3619-22.

102. Silvester S, Allen H, Withey C, Morgan M, Holland WW. The provision of medical services to sick doctors. A conspiracy of friendliness? A study by the Department of public health medicinc UMDS St. Thomas Campus. Edited by Mitchell D, Ledingham J, Ashley-Miller M. Burgess (Abingdon) Oxfordshire, Nuffield Provincial Hospitals Trust, London,1994.

103. Pitt E, Rosenthal MM, Gay TL, Lewton E. Mental health services for residents: more important than ever. Acad Med 2004; 79: 840-4.

104. Schancke V. Rapport 1/2003 of drift av forebygging.no til Statens institutt for rusmiddelforskning, SIRUS. Kompetansesenteret ved Nordlandsklinikker, Forebygginsseksjonen. 2003

105. Caplan G. Principles of preventive psychiatry. London: Tavistock, 1964.

106. Mrazek PJ, Haggerty RJ.Reducing risks for mental disorders: Frontiers for preventive intervention research.: Commitee on prevention of mental disorders. Institute of Medicine; Washington 1994: 19-52

107. Marine A, Ruotsalainen J, Serra C, Verbeek J. Preventing occupational stress in healthcare workers. Cochrane Database of Systematic Reviews 2006, CD002892.

108. McCray LW, Cronholm PF, Bogner HR, Gallo JJ, Neill RA. Resident physician burnout: is there hope?. Review. Fam Med 2008, 40: 626-32.

109. McCue JD, Sachs CL.A stress management workshop improves residents' coping skills. Arch Intern Med 1991, 151: 2273-77.

110. Margalit AP, Glick SM, Benbassat J, Cohen A, Katz M. Promoting a biopsychosocial orientation in family practice: effect of two teaching programs on the knowledge and attitudes of practising primary care physicians. Med Teach 2005; 27: 613-18.

111. von Vultèe P, Axelsson R, Arnetz B. Individual and organizational well-being of female physicians - an assessment of 3 different management programs. Medscape General Medicine 2004; 6(1)

112. Holt J, Del Mar C.Reducing occupational psychological distress: a randomized controlled trial of a mailed intervention. Health Educ Res 2006;21:501-7.

113. Krasner MS, Epstein RM, Beckman H, Suchman AL, Chapman B, Mooney CJ Quill TE. Association of an educational program in mindful communication with burnout, empathy, and attitudes among primary care physicians. JAMA 2009; 302:1284-93.

114. Rowe MM. Teaching health-care providers coping: results of a two-year study. Journal of Behavioral Medicine 1999; 22(5):511-27.

115. Maslach C, Schaufeli WB, Leiter MP. Job burnout. Annual Review of Psychology 2001;52:397-422.

116. Bergman D, Arnetz B, Wahlstrom R, Sandahl C. Effects of dialogue groups on physicians' work environment. Journal of Health Organization and Management 2007; 21: 27-38.

117. Dunn PM, Arnetz BB, Christensen JF, Homer L. Meeting the imperative to improve physician well-being: assessment of an innovative program. J Gen Intern Med 2007; 22:1544-52.

118. Awa WL, Plaumann M, Walter U. Burnout prevention: A review of intervention programs. Patient Educ Couns 2010; doi: 10.1016/j.pec.2009:04.008.

119. Hem E, Stokke G, Tyssen R, Gronvold NT, Vaglum P, Ekeberg O. Self-prescribing among young Norwegian doctors: a nine-year follow-up study of a nationwide sample. BMC Medicine 2005; 3:16.

120. Norwegian Medical Association. Statistics on physicians. http://www.legeforeningen.no/id/18; 2005.

121. Aasland OG, Falkum E, Thaulow IS. Hva vet norske leger om egne hjelpe- og støtteordninger? Tidsskr Nor Laegeforen 2006; 126:3256-7.

122. Lunde D. Det får vel være grenser. In Utbrent. Krevende jobber -gode liv? 3rd edition. Edited by Roness A, Matthiesen SB. Fagboksforlaget.Bergen. 2002:244-59.

123. Friis S, Vaglum P. Fra idé til prosjekt - en innføring i klinisk forskning 2nd edition 2002. Tano Aschehoug. Otta. 1986.

124. Nunnally JC, Bernstein IH. Psychometric theory, 2nd edn. New York: 1978.

125. Moum T. Mode of administration and interviewer effects in self-reported symptoms of anxiety and depression. Social Indicators Research 1998; 45: 279-318.

126. Langballe EM, Innstrand ST, Hagtvet KA, Falkum E, Gjerlow AO. The relationship between burnout and musculoskeletal pain in seven Norwegian occupational groups. Work 2009; 32:179-88.

127. Campbell DT, Fiske DW. Convergent and discriminant validation by the multitrait-multimethod matrix. Psychol Bull 1959; 56:81-105.

128. Tambs K, Moum T. How well can a few questionnaire items indicate anxiety and depression? Acta Psychiatr Scand 1993; 87:364-7.

129. Veijola J, Jokelainen J, Laksy K, Kantojarvi L, Kokkonen P, Jarvelin MR Joukamaa M. The Hopkins Symptom Checklist-25 in screening DSM-III-R axis-I disorders. Nordic Journal of Psychiatry 2003; 57:119-23.

130. Strand BH, Dalgard OS, Tambs K, Rognerud M. Measuring the mental health status of the Norwegian population: a comparison of the instruments SCL-25, SCL-10, SCL-5 and MHI-5 (SF-36). Nordic Journal of Psychiatry 2003;57(2):113-8.

131. Aasland OG, Falkum E. Legekårsundersøkelsen. Responsen på spørreskjemaundersøkelsen. Tidsskrift for Den Norske Laegeforening 1994; 114(26):3052-8.

132. Sandanger I, Moum T, Ingebrigtsen G, Sorensen T, Dalgard OS, Bruusgaard D. The meaning and significance of caseness: the Hopkins Symptom Checklist-25 and the Composite International Diagnostic Interview. II. Soc Psychiatry Psychiatr Epidemiol 1999; 34:53-9.

133. Gude T, Vaglum P, Tyssen R, Ekeberg O, Hem E, Rovik JO Finset K, Gronvold NT. Identification with the role of doctor at the end of medical school: a nationwide longitudinal study. Medical Education 2005; 39(1):66-74.

134. Francis LJ, Brown LB, Philipchalk R. The development of an abbreviated form of the Revised Eysenck Personality Questionnaire (EPQR-A): its use among students in England, Canada, the USA and Australia. Personality and Individual Differences 1992; 13: 443-9.

135. Tambs K. Explained variance and reliability of EPQ-shortened versions. 2008. Personal Communication

136. Mortensen EL, Reinisch JM, Sanders SA. Psychometric properties of the Danish 16 PF and the EPQ. Scand J Psychol 1996; 37:221-5.

137. First MB, Spitzer RL, Gibbon M, Williams JBW, Benjamin L. Structured clinical interview for DSM-IV(SCID II), (Version 2,0). Manual, New York State Psychiatric Institute. New York 1995

138. Paykel ES, Myers JK, Lindenthal JJ, Tanner J. Suicidal feelings in the general population: a prevalence study. British Journal of Psychiatry 1974;124:460-9.

139. Falkum E. Evaluering av virksomheten ved Ressurssenter for leger fra 1.oktober 1998 til 1. august 2000. Legeforeningens forskningsinstitutt, Oslo 2001.

140. Cohen J. Statistical power analysis for the behavioral sciences, Second edn. Hillsdale NJ: Laurence Earlbaum Associates; 1988.

141. Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. Structural equation modelling 1991; 6: 1-54.

142. Glymour MM, Weuve J, Berkman LF, Kawachi I, Robins JM. When is baseline adjustment useful in analyses of change? An example with education and cognitive change. Am J Epidemiol 2005, 162: 267-78.

143. Eliason SR. Maximal likelihood estimation. Logic and practice. Sage Publications Ltd, London; 1993.

144. Ellis JJ, Inbody DR. Psychotherapy with physicians' families: when attributes in medical practice become liabilities in family life. Am J Psychother 1988; 42:380-8.

145. Garelick AI, Gross SR, Richardson I, von der TM, Bland J, Hale R. Which doctors and with what problems contact a specialist service for doctors? A cross sectional investigation. BMC Medicine 2007;5:26.

146. Semmer NK. Job stress interventions and the organization of work. Scand J Work Environ Health 2006; 32:515-27.

147. Hargreave M, Petersson BH, Kastrup MC. Gender differences in stress among physicians. Ugeskr Laeger 2007; 169:2418-22.

148. Dumelow C, Littlejohns P, Griffiths S. Relation between a career and family life for English hospital consultants: qualitative, semistructured interview study. BMJ 2000; 320:1437-40.

149. Isaksson Rø KE, Gude T, Tyssen R, Aasland OG. A self-referral preventive intervention for burnout among Norwegian nurses: One-year follow-up study. Patient Educ Couns 2010; doi:10.1016/j.pec.2009:07.008.

150. Lambert VA, Lambert CE. Literature review of role stress/strain on nurses: an international perspective. Nursing and Health Sciences 2001; 3:161-72.

151. Oberle K, Hughes D. Doctors' and nurses' perceptions of ethical problems in end-of-life decisions. J Adv Nurs 2001; 33:707-15.

152. Alspach G. Critical care nurses as coworkers: are our interactions nice or nasty? Crit Care Nurse 2007; 27:10-14.

153. Kalvemark S, Hoglund AT, Hansson MG, Westerholm P, Arnetz B. Living with conflicts-ethical dilemmas and moral distress in the health care system. Soc Sci Med 2004; 58:1075-84.

154. Thomsen S, Soares J, Nolan P, Dallender J, Arnetz B. Feelings of professional fulfilment and exhaustion in mental health personnel: the importance of organisational and individual factors. Psychother Psychosom 1999; 68:157-64.

155. Petterson IL, Arnetz B. Perceived relevance of psychosocial work site interventions for improved quality of health care work environment. Vard Nord Utveckl Forsk 1997; 17:4-10.

156. Tyssen R, Vaglum P, Gronvold NT, Ekeberg O. The relative importance of individual and organizational factors for the prevention of job stress during internship: a nationwide and prospective study. Med Teach 2005; 27:726-31.

157. Barnett RC, Gareis KC, Brennan RT. Fit as a mediator of the relationship between work hours and burnout. J Occup Health Psychol 1999; 4:307-17.

158. Firth-Cozens J. Doctors, their wellbeing, and their stress. BMJ 2003; 326(7391):670-1.

159. Firth-Cozens J. The psychological problems of doctors. In Stress in health professionals: psychological and organisational causes and interventions. Edited by Firth-Cozens J, Payne RL. John Wiley and sons Ltd.Chichester 1999:79-92.

Appendix

Items in Maslach´s Burnout Inventory

1. Jeg føler at arbeidet tømmer meg følelsesmessig EXH

2. Jeg forstår lett hva pasientene mine føler ACC*

3. Jeg føler meg oppbrukt når arbeidsdagen er over EXH

4. Jeg ordner effektivt opp i pasientenes problemer ACC*

5. Jeg føler meg sliten når jeg står opp på morgenen og vet at jeg må på jobb EXH

6. Jeg føler at jeg har positiv innflytelse på andre menneskers liv gjennom det jeg gjør ACC*
    i jobben.

7. Jeg er redd for at denne jobben er i ferd med å gjøre meg følelsesmessig kald. DEP

8. Det er virkelig anstrengende for meg å jobbe med mennesker hele dagen. EXH

9.   Jeg føler meg full av energi EXH*

10. Jeg føler meg utbrent i jobben EXH

11. Jeg bryr meg egentlig ikke om hva som DEP
    hender med enkelte pasienter

12. Jeg skaper lett en avslappet atmosfære med pasientene mine. ACC*

13. Jeg føler meg frustrert i jobben. EXH

14. Jeg er blitt ufølsom overfor folk etter at jeg begynte i denne jobben DEP

15. Jeg føler meg oppkvikket når jeg har jobbet nært med pasientene. ACC*

16. Jeg føler at jeg arbeider for hardt i jobben. EXH

17. Jeg føler at pasientene gir meg skylden for noen av sine problemer DEP

18. Jeg har gjort mye som er verdt innsatsen i denne jobben.   ACC*

19. Å arbeide med mennesker er for stressende for meg.   EXH

20. Jeg føler et visst ubehag når jeg tenker på hvordan jeg har oppført meg overfor   DEP
    enkelte pasienter.

21. I jobben takler jeg følelsesmessige problemer på en rolig måte   ACC*

22. Jeg føler at jeg ikke orker stort mer.   EXH

23. Jeg føler meg på mange måter lik pasientene mine.   DEP

24. Jeg føler at jeg behandler enkelte pasienter som om de var upersonlige ting   DEP

25. Jeg føler meg personlig involvert i mine pasienters problem.   DEP

EXH – Emotional exhaustion, DEP – Depersonalisation/Cynicism, ACC – reduced personal
accomplishment   * - scores of item reversed

Items of Mental distress – SCL5

26. Nervøsitet, indre uro

27. Stadig redd eller engstelig

28. Følelse av håpløshet med tanke på fremtiden

29. Mye bekymret eller urolig

30. Nedtrykt, tungsindig

Items in Abbreviated version of Cooper´s job stress questionnaire

31.	Bekymring over klager fra pasienter	FL
32.	Telefoner/sykebesøk/utkallelser om natten	EM
33.	Tidspress	SO
34.	Jobben går ut over familieliv	SO
35.	Jobben går ut over sosialt liv	SO
36.	Daglig kontakt med døende og kronisk syke pasienter	EM
37.	Å ta seg av dødssyke pasienter og deres pårørende	EM
38.	Å ha sine venner som pasienter	EM
39.	Å ha sine slektninger som pasienter	EM
40.	Foreventninger om at legen skal hjelpe med også ikke-medisinske problemer	EM
41.	Faren for å bli trukket til rettslig ansvar	FL
42.	Å ta seg av lidende pasienter	EM
43.	Å få til en balanse mellom arbeid og privatliv	SO
44.	Faren for å gjøre medisinske feil	FL
45.	Krav om økonomiske hensyn i legearbeidet	SO
46.	Kritikk av leger i media	FL
47.	Andres urealistiske forventninger til deg som lege	FL

48.	Pasientene setter ikke pris på det du gjør	FL
49.	Følelsesmessig engasjement i pasienter	EM
50.	Økning av antall pasienter og pårørende som ønsker vurdering også av spesialist	EM
51.	Bekymring for egen økonomi	SO
52.	Være oppmerksom og opplagt på vakt	SO
53.	Sykejournaler og annet papirarbeid	SO
54.	Akuttsituasjoner/øyeblikkelig hjelp situasjoner	EM
55.	Avbrytelser og mas i arbeidssituasjonen	SO
56.	Arbeidsmiljø	SO

EM – emotional stress. SO – social stress FL – stress due fear of litigation

Items in abbreviated version of Vitaliano´s ways of coping checklist.

57.	Forandrer deg eller vokser som menneske på en god måte.	AC
58.	Ønsker at situasjonen skulle bli borte eller på et eller annet vis gå over av seg selv.	EC
59.	Snakker med noen som kan gjøre noe med problemet.	AC
60.	Ønsker du kunne forandre måten din å føle på.	EC
61.	Skulle ønske du var sterkere – mer optimistisk og hadde mer krefter.	EC
62.	Du snakker med noen for å finne ut mer om situasjonen.	AC

63. Dagdrømmer eller tenker deg inn i en bedre tid eller et bedre sted enn den/der du er nå.   EC

64. Finner fram til flere forskjellige løsninger på problemet.   AC

65. Du klandrer deg selv.   EC

66. Snakker med noen om hvordan du har det.   AC

67. Ønsker du kunne forandre det som er skjedd.   EC

68. Spør en slektning eller en venn du respekterer om råd.   AC

69. Kommer sterkere og bedre rustet ut av hendelsen enn du gikk inn i den.   AC

70. Tenker på noe fantastisk eller utrolig som kunne skje (slik som hevn, eller at du fant 1 million) som fikk deg til å føle deg bedre.   EC

71. Gjør en forandring slik at det vil gå bra til slutt.   AC

72. Har fantasier eller ønsker om hvordan det skal gå til slutt.   EC

73. Tar i mot sympati og forståelse fra noen.   AC

74. Kritiserer eller sier til deg selv hva du burde ha gjort.   EC

AC – Active coping   EC – Emotion-focused coping

Items in Eysenck´s abbreviated personality questionnaire on neuroticism and intro-/extroversion.

75. Er du ofte bekymret?   N

76. Blir dine følelser lett såret?   N

77. Hender det ofte at du "går trøtt"?   N

78. Plages du av "nerver"?   N

79. Har du ofte følt deg trøtt og likeglad uten grunn?   N

80. Bekymrer du deg for at fryktelige ting kan skje?   N

81. Klarer du å få fart i et selskap?   E

82. Er du stort sett stille og tilbakeholden når du er sammen med andre?   E*

83. Liker du å treffe nye mennesker?   E

84. Liker du å ha masse liv og røre rundt deg?   E

85. Er du forholdsvis livlig?   E

86. Tar du vanligvis selv initiativet for å få nye venner?   E

N – Neuroticism E – dimension of extro/introversion * - scores of item reversed

I

Research article

Does a self-referral counselling program reach doctors in need of help? A comparison with the general Norwegian doctor workforce

Karin E Isaksson Rø*[1,2], Tore Gude[1,2] and Olaf G Aasland[3]

Address: [1]Department of Behavioural Sciences in Medicine, Institute of Basic Medical Sciences, Faculty of Medicine, University of Oslo, Norway Postbox 1111 Blindern, 0317 Oslo, Norway, [2]The Research Institute, Modum Bad, 3370 Vikersund, Norway and [3]The Research Institute, The Norwegian Medical Association, Postbox 1152 Sentrum, 0107 Oslo, Norway and Institute of Health Management and Health Economics, University of Oslo, Postbox 1111 Blindern, 0317 Oslo, Norway

Email: Karin E Isaksson Rø* - k.e.i.ro@medisin.uio.no; Tore Gude - tore.gude@medisin.uio.no; Olaf G Aasland - olaf.aasland@legeforeningen.no

* Corresponding author

Abstract

Background: Doctors have a relatively high degree of emotional distress, but seek help to a lesser degree and at a later stage than other academic groups. This can be deleterious for themselves and for their patients. Prevention programs have therefore been developed but it is unclear to what extent they reach doctors in need of help. This study describes doctors who participated in a self-referrral, easily accessible, stress relieving, counselling program in Norway, and compares them with a nationwide sample of Norwegian doctors.

Methods: Two hundred and twenty seven (94%) of the doctors, 117 women and 110 men, who came to the resort centre Villa Sana, Modum, Norway, between August 2003 and July 2005, agreed to participate in the study. Socio-demographic data, reasons for and ways of help-seeking, sick-leave, symptoms of depression and anxiety, job stress and burnout were assessed by self-reporting questionnaires.

Results: Forty-nine percent of the Sana doctors were emotionally exhausted (Maslach) compared with 25% of all Norwegian doctors. However, they did not differ on empathy and working capacity, the other two dimensions in Maslach's burnout inventory. Seventy-three percent of the Sana doctors could be in need of treatment for depression or anxiety based on their symptom distress scores, compared with 14% of men and 18% of women doctors in Norway. Twenty-one percent of the Sana doctors had a history of suicidal thoughts, including how to commit the act, as compared to 10% of Norwegian doctors in general.

Conclusion: Sana doctors displayed a higher degree of emotional exhaustion, symptoms of depression and anxiety as well as job related stress, compared with all Norwegian doctors. This may indicate that the program at Villa Sana to a large extent reaches doctors in need of help. The counselling intervention can help doctors to evaluate their professional and private situation, and, when necessary, enhance motivation for seeking adequate treatment.

Background

Emotional distress and impaired function among doctors can be deleterious for patients, as well as for the doctors themselves, their colleagues, other co-workers and families [1-3]. Doctors have a relatively high prevalence of depression, as well as higher suicide rates compared to other academic groups [4-8], and possibly also an increasing prevalence of burn-out [9]. Whereas these facts should lead to early helpseeking, doctors seem to seek help to a lesser degree, and later in the course of disease than do other groups [10,11]. Doctors do not easily adapt to the patient role and they also have problems being professional when treating a colleague [12,13]. Especially regarding mental health problems, doctors tend to be passive, embarrassed to seek help and worried about lack of confidentiality [2,14]. The term "hazardous heroes" has been used about doctors going to work with symptoms and problems for which they would have given their patients sick-leave [15].

Internationally it has been observed that doctors obtain treatment late in the course of emotional distress; many have been prompted by third parties such as insurance companies, police and review boards, which indicates that job performance has been impaired [16,17]. Treatment programs have with some success tried to lower the threshold for seeking treatment by letting the doctors use pseudonyms [16,18], offering treatment at one centralized national hospital in order to avoid the local environment [19], and by ensuring complete confidentiality, easy access and offices not identifiable with psychiatry [20,21].

The conditions described above have also led to the establishment of preventive programs. Primary and secondary preventive interventions for doctors have focused on developing appropriate stress management and coping skills [22-24]. Possible effects of such programs on emotional distress need further documentation. It is also important to explore the characteristics of the doctors recruited to such programs. Do the programs really reach doctors in need of help? To answer this, one needs to compare the help seeking group with the general doctor population. Few studies of this kind have been performed, and none in Norway.

In 1998, the Norwegian Medical Association (NMA) established a short-term counselling program for doctors, called Villa Sana. The declared aims for this effort were to enhance health and life quality, strengthen professional awareness and identity and prevent burnout. A prospective study of sociodemographic and clinical characteristics of doctors entering this program over a two-year period from August 2003 was initiated. The questionnaires were chosen in order to make the data comparable to those from a nationwide sample of Norwegian doctors. In this paper, we have raised the following research questions:

1. What characterizes doctors who seek help at Villa Sana with regard to gender, age and speciality compared to all Norwegian doctors?

2. a) How do doctors apply for help at Villa Sana, and what reasons do they give for seeking help?

b) To what degree did they seek help before coming to Villa Sana?

3. Do doctors seeking help at Villa Sana differ from Norwegian doctors concerning degree of job stress, burnout and symptoms of depression and anxiety?

The Villa Sana program

The program offers two kinds of interventions for doctors or doctors with partners, who feel the need to reflect on their situation, related either to professional or private matters or both. One is a single day counselling session with one counsellor if the doctor comes alone, or two counsellors when there is also a partner or a spouse. The session lasts for 6–7 hours, aiming to give time and possibility to discuss the doctor's life situation and to suggest steps needed to handle the situation. This can include advice on seeking formal medical treatment including psychotherapy. The other type of intervention is a group-based, week-long course with boarding, dimensioned for eight individual doctors or four couples. There are daily lectures, group discussions and physical activity. One individual counselling session is offered during the week. Themes for the lectures are: possibilities and restraints in working life, the individual's resources and personality, concepts of identity, family relations, communication, team work and prevention of burnout. The group discussions are based on the participants' own experiences, providing the possibility to share these issues with colleagues.

The idea behind Villa Sana was that the program should be easily accessible. This includes making contact procedures as simple as possible, having readily available times for counselling appointments and having few restrictions as to reasons for contact. Doctors can contact Villa Sana directly on the phone, by post or by e-mail for an appointment. No referral is needed. All applicants are welcomed, except when need for immediate medical treatment is obvious, like serious risk for suicide or psychotic breakthrough. The program has been presented in the Norwegian Medical Journal and is announced twice a year in the same Journal. There are internet links to Villa Sana from the Norwegian Medical Association's web pages, as well as from Modum Bad's web pages. Members of the staff at

Villa Sana are also invited to different physician meetings to inform about the program.

The Norwegian Medical Association covers all expenses, including travelling costs, making it possible for doctors from all parts of Norway to use Villa Sana. Since the program is defined as a preventive and not a clinical intervention, no medical records are kept.

Methods

Of 242 eligible doctors, who participated in the Villa Sana programs between August 2003 and July 2005, 227 doctors (94%) gave their informed, written consent to participate in the study. Eighty-two percent (n = 187) came for a counselling session and 18% (n = 40) took part in the course program. The Sana doctors are compared with data from a survey of health, work conditions and life quality of Norwegian doctors from 1993 [25], comprising from 1009 – 6600 doctors depending on the object of inquiry.

Specialities are grouped into

non-specialist, general practice (GP), internal medical specialities, surgical specialities, psychiatric specialities, public health and laboratory medicine [25].

Ways of help-seeking

There are five dichotomous categories (0-no, 1-yes). If more than one category is marked yes, only one is chosen, ranking "referral" highest, "prompting by a colleague" second, "the doctor's own initiative" third, "coming because partner asked them to" fourth and "other reasons" fifth.

Reason(s) for help-seeking

are defined as one or more of the following areas: health and life quality, exhaustion/burnout, professional identity (meaning identification with the role as a doctor) [26], work-related conditions, private relations and "other reasons" with an option for free text. Specified reasons under "other" were all, except one, possible to categorize under one of the first five areas – hence "other" is in the following omitted. Reasons are scored on a five-point scale (0- not decisive for help-seeking to 4-decisive for help-seeking). Scores 3 or 4 were considered "weighty reason".

Job stress

A 26 items version of the original 43 items Cooper's job stress questionnaire [27], was used. Responses were given on a five-point scale with 1 = no stress and 5 = very much stress. This reduction was based partly on a Principal Component Analysis of data from a Norwegian student/doctor cohort from 1993 [28] yielding a 17-item version, and partly on the inclusion of nine other relevant items from the original instrument, amounting to 26 items (Cronbach's α = .90) with three subscales: emotional

stress (10 items, α = .83), fear of litigation (6 items, α =.85), and social job-stress including time stress (10 items, α = .83).

Burnout

Maslach's Burnout Inventory (MBI), with three sub-scales, was used – emotional exhaustion (10 items), reduced empathy (8 items), and reduced work capacity (7 items) [3,29]. Scores were given on a five-point scale (1 – does not fit, 5 – fits very well) evaluating the last two weeks of work. Reduced work capacity is presented with a reverse scale, so that a high value means low capacity. The dimensions are dichotomized in high and low, with cut-off >3 called case [3].

General measure of depression and anxiety

Hopkin's symptom check list 5 (SCL-5) [30]was used. Answers were given on a five-point scale (1 – not at all, 5 – very much) evaluating the last two weeks. Studies on SCL-5 presented in literature, have used a four-point scale (1-not at all, 4-very much), with a cut-off of 1.67 for men and 1.75 for women indicating psychiatric case-ness/need for treatment [31]. Multiplying our cut-offs with 5/4 can give a case-estimate based on the five-point scale, yielding a cut-off of 2.09 for men and 2.19 for women. (Moum T, personal communication).

Suicidal disposition

Measured by three of Paykel's five items [32]: "Have you ever had thoughts about taking your own life?", scored on a five-point scale (0 – never, 4 – very often), "Have you ever seriously considered taking your own life with plans on how to do so?" and " Have you ever attempted to commit suicide?"(both scored 0 – no and 1- yes).

Sick leave

On sick-leave now (0-no, 1-on full-time sick-leave, 2- on part-time sick-leave, 3- full-time rehabilitation or disability leave, 4 – part-time rehabilitation or disability leave, 5 -on retirement).

Present contact with GP

(0-no, 1-yes)

Present contact with psychiatrist or psychologist

(0-no, 1-yes)

Control samples

Due to the ten year gap between the 1993 survey and our study, we also investigated possible differences in comparable measurements with a nationwide medical student cohort followed from end of medical school (1993) throughout internship and residency (2003). The cohort is described by Tyssen et al [28], but the 10-year follow-up data from 2003 are not yet publicised (Røvik Jan Ole, per-

sonal communication). Controlled regarding gender and age, there were no significant differences on Hopkin's Symptom Check list (SCL5) nor on the dimension of emotional exhaustion (MBI) between the young doctor cohort in 2003 and all Norwegian doctors surveyed in 1993. Job stress showed a statistically significant, higher level in 2003, caused by the subdimension emotional stress: 1.97 (95% Confidence Interval [CI] 1.88–2.06) for 2003 versus 1.72 (95% CI 1.68–1.74) in 1993, p < 0.001. The two other job stress dimensions did not differ significantly. Suicidal measures were lower in 2003, but reported as last year's incidence, as opposed to life-time prevalence in 1993.

In addition, we have used general statistical data from the Norwegian Medical Association for 2004 and 2005, including doctors < 70 years (NMA web site).

Statistics
Means, correlations, Students' t-test, Chi-square, ANCOVA, Logistic and Linear Regression Analysis were used, with the statistical program SPSS 13.0.

The study is approved by the Regional Ethical Committee for Ethical Research in the South of Norway and by the Data Inspectorate through the Norwegian Social Science Data Services.

Results
Gender, age and speciality
There were 117 (52%) women and 110 (48%) men in the Sana sample. For comparison on gender, age and special-

ity between the Sana-population and Norwegian doctors, see Table 1.

The proportion of GPs was significantly higher in the Sana population (Odds Ratio (OR) = 1,67 95% Confidence Interval (CI) 1.20 to 2.32 p = 0.002), whereas other speciality differences between the two samples were not significant, when controlled for age and gender.

Help-seeking
Fourty-five percent of the doctors came to Villa Sana on their own initiative, 37% reported that they were prompted by a colleague, 10% were referred, 6% came because they were asked by their partner and 2% came "for other reasons", without gender or age differences.

Weighty reasons for contacting Villa Sana are presented in Table 2. Most doctors state that health and life quality and exhaustion were weighty reasons for coming. More women than men stated exhaustion, and more men than women came for private reasons. Problems with professional identity were reported by 46% (95% CI 27–55) of those younger than 40 years, by 30% (95% CI 21–39) for those between 40–50 years and by 19% (95%CI 10–27) for those over 50 years of age. There is a significant difference between the youngest and the oldest group (p < 0.01).

Among the Sana doctors two were recipients of 100% and four of 50% rehabilitation or disability benefits, and one doctor was retired. Among the remaining doctors (N = 219, one person not having answered) 41% (95% CI 33–47) were on sick-leave at the time of their first visit, with

Table 1: Demographic data comparing Sana-doctors, Norwegian doctors 1993 and Norwegian doctors 2004/2005.

	Sana-doctors Mean (95%CI) Percentage (95% CI) n = 226	Norwegian doctors 1993 Mean (95%CI) Percentage (95% CI) n = 6602	Sign.	Norwegian doctors 2004/2005 * Mean Percentage n = 17500
Age (years)				
The whole population	46.9 (31.9–67.2)	42.5 (23.9– 60.7)	p < 0.001	45
Men	49.7 (32.0–67.3)	44.0 (25.4–62.6)	p < 0.001	
Women	44.3 (28.2– 60.4)	38.9 (21.5–56.3)	p < 0.001	
Gender (%)				
Men/Women	48 (42–55)/52 (45–58)	71 (70–72)/29 (28–30)	p < 0.001	64/36
Specialities (%)				
Non-specialist	30 (24–36)	42 (40–43)	p = 0.001	45
General practice	22 (17–28)	14 (13–15)	p = 0.001	13
Internal medical specialities	16 (11–21)	15 (14–16)	ns	15
Surgical specialities	15 (10–19)	14 (13–15)	ns	14
Psychiatric specialities	8 (5–12)	6 (5–7)	ns	6
Others (including social medicine and laboratory specialities)	8 (5–12)	9 (8–10)	ns	8

*Data from the Norwegian Medical Association. Doctors < 70 years.

Table 2: Reasons for seeking help.

Weighty reasons for helpseeking (>2 on a scale from 0–4)	Total % (95% CI) n = 224	Men/Women % (95% CI) n = 108/116	Sign.
Health and life quality	68 (62–74)	67 (58–76)/69 (60–77)	ns
Exhaustion/Burn-out	61 (55–68)	52 (42--61)/69 (60–77)	P = 0.01
Private relations	56 (49–62)	65 (56–74)/48 (39–57)	p < 0.05
Work-related conditions	44 (38–51)	41 (31–50)/46 (37–55)	ns
Professional identity	28 (22–34)	25 (17–33)/31 (23–39)	ns

Proportions of doctors presenting each of the following reasons as a weighty reason for coming to Villa Sana. (Each doctor can present one or more reasons).

significant gender differences: 49% (95% CI 40–58) women (including 5 doctors on part-time sick-leave) versus 32% (95%CI 23–41) men (including 4 doctors on part-time sick-leave) p < 0.05. Age did not influence the proportion of doctors on sick-leave.

Thirty-nine percent had a present GP- contact, and 20% were in therapy with a psychiatrist or a psychologist when contacting Villa Sana.

Distress assessments
The comparison between the Sana doctors and all Norwegian doctors regarding distress assessments showed that Sana doctors had significantly higher levels of emotional exhaustion (MBI), depression and anxiety (SCL5), all job stress dimensions and suicidal thoughts controlled for age and gender (Table 3). They did not have higher levels of reduced empathy or reduced work capacity (MBI).

In the Sana group, 49% (95% CI 43 to 56) were defined as "cases" on the dimension of emotional exhaustion (MBI), compared to 25% (95% CI 22 to 28) among Norwegian doctors (p < 0.001).

Concerning SCL-5, cases with scores above cut-off and thus possibly in need of treatment were 73% (95% CI 64 to 81) among male Sana doctors versus 14% (95% CI 12–17) among Norwegian male doctors. Among women, 73% (95% CI 65–81) of the Sana doctors compared with 18% (95% CI 14–22) among Norwegian doctors scored above cut-off (p < 0.001 for both men and women).

Twenty-one percent (95% CI 15 to 26) of Sana doctors compared to 10% (95% CI 8 to 12) of all Norwegian doctors had seriously considered suicide, as well as having planned it (p < 0.001). Concerning attempted suicide, 2.6% (95% CI 0.6 to 4.7) of Sana-doctors compared to 1.6% (95% CI 0.8 to 2.3) of Norwegian doctors reported this (non significant difference).

Discussion
One of the main findings in this study is the high level of distress among the Sana doctors compared with all Norwegian doctors, assessed with regard to emotional exhaustion, symptoms of depression and anxiety (SCL5 and suicidal thoughts and plans) and job stress parameters. Data indicate that 73% of the doctors coming to Villa

Table 3: Comparison of burnout, SCL-5, job stress and suicidal thoughts between Sana-doctors and Norwegian doctors 1993.

	Sana-doctors Estimated Marginal Mean (95% CI of standard error)	Norwegian doctors 1993 Estimated Marginal Mean (95% CI of standard error)	Sign.
MBI – emotional exhaustion (1–5)	3.11 (3.00–3.22)	2.52 (2.46–2.57)	p < 0.001 ‡
MBI – reduced empathy (1–5)	1.96 (1.89–2.03)	1.92 (1.89–1.96)	ns † ‡
MBI – reduced capacity (1–5)	2.31 (2.25–2.37)	2.45 (2.42–2.48)	p < 0.001 ‡
SCL-5 (1–5)	2.91 (2.81–3.01)	1.55 (1.50–1.60)	p < 0.001
Job stress: Total (1–5)	2.51 (2.42–2.60)	2.02 (1.99–2.05)	p < 0.001 ‡
Job stress: Emotional (1–5)	2.19 (2.08–2.29)	1.70 (1.66–1.73)	p < 0.001 ‡
Job stress: Social (1–5)	2.88 (2.78–2.98)	2.28 (2.25–2.31)	p < 0.001 ‡
Job stress: Fear of litigation (1–5)	2.28 (2.17–2.39)	2.12 (2.08–2.15)	p < 0.01 ‡
Suicidal thoughts (0–4)	1.19 (1.08–1.30)	0.54 (0.49–0.60)	p < 0.001 ‡

Controlled for gender and age.
n for Sana = 222–227, n for Norwegian doctors 1993 1070 – for MBI and SCL-5, 1009 for suicidal thoughts, and 2497 for job stress.
For significant independent gender effect p < 0.01 = †
For significant independent age effect p < 0.01 = ‡

Sana could be in need of treatment. The program thus reaches doctors who potentially are in serious need of help. Villa Sana being easily accessible, and the fact that the institution is not part of the ordinary medical services, probably facilitates help-seeking. The program seems to be a way of coming into contact with emotionally distressed doctors, where counselling can help them to evaluate their professional and private situation, in addition to enhancing their motivation for treatment, when necessary. Given the reluctance among doctors to ask for help [10,11], such motivation is probably important in a process of seeking adequate professional treatment.

Emotional exhaustion has, according to Falkum [3], been viewed by most authors as the primary dimension in a subsequent development of burnout. The apparent discrepancy in the Sana doctors between reporting high levels of emotional exhaustion, and at the same time not demonstrating reduced empathy or work capacity, is interesting, suggesting either that they take action in time to prevent burnout or stay working as "hazardious heroes", even with considerable distress, in order to fulfill their obligations and to maintain their self-esteem. Two recent studies have found a relationship between burnout dimensions and self-perceived sub-optimal patient care or medical mistakes, one of them suggesting a reciprocal cycle of the one triggering the other [33,34]. These studies, consonant with our findings, point to the importance of burnout prevention, both for the doctors' and their patients' well-being. More research concerning these relationships is needed [35].

Most of the doctors seeking help at Villa Sana present health issues, exhaustion and burnout as weighty reasons for coming. This is in line with the aims of the program, since it was established for potentially exhausted doctors. Among the younger doctors, problems with professional identity were found to be an important reason for help-seeking. This is consonant with a Finnish study, in which plans for changing career were associated with burnout especially among young doctors [36], as well as a study from the United States where career satisfaction showed a strong inverse relationship to burnout [33]. The early phases of the career, before speciality choices have been made, may be a period in which some doctors could benefit from counselling.

Although some studies indicate that female doctors have a higher prevalence of depression or minor psychiatric disease than male doctors [2,5,6,37], women doctors have not been found to have a higher degree of help-seeking than men [21,38]. The help-seeking studies however, refer mainly to younger doctors, whereas there are indications of increasing mental distress with age among women doctors, at least in the United Kingdom [6]. This might

explain the higher proportion of women at Villa Sana. The issue of confidentiality could also be more important for women than for men [14], and Villa Sana provides a more confidential setting than ordinary psychiatric treatment.

The relative over-representation of GPs in the Sana group indicates that also Norwegian GPs experience more stress than other specialists, as found elsewhere [36,39,40].

Of the doctors who were already in therapy when contacting Villa Sana, many, according to our experience, wanted to discuss aspects of work. We have no registration of the intensity or type of therapy offered to these doctors and there might be several reasons for contacting Villa Sana while in therapy. One possibility is that some therapists and/or doctors view Villa Sana as a place of competence regarding problems related to doctors' work.

The comparative data used were collected ten years prior to our study, which is a limitation to interpreting the results. On the other hand, a more recent study in 2003 of Norwegian doctors, demonstrates that there is little difference between doctors in 1993 and 2003 on some important measures relevant to this study, indicating that the level of distress and mental health problems among Norwegian doctors has not changed dramatically over this period.

Another limitation is the self-reported information, including possible influence of distress symptoms on self-assessment of empathic aptitude and work capacity. The comparable data and studies referred to also use self-reporting forms, thus validating the comparison. There is, however, great need for a more objective evaluation of the relation between self-assessment and objective assessment as underlined in a recent review-article [41].

The major strength of this study is that it recruits a group of doctors seeking help at a counselling program, few studies of this kind having been done previously. The possibility to compare the help-seeking group with Norwegian doctors in general strengthens the design. The prospective aspect of the study enables us to follow the course of distress in the Sana doctors, one and three years after the short-term intervention they have been offered, and to document further help-seeking patterns.

Conclusion
In comparison with all Norwegian doctors, this study shows high levels of emotional exhaustion, symptoms of depression and anxiety and job-related stress in doctors coming to an easily accessible, short term counselling program. In view of doctors' general reluctance to seek treatment, it is important to document that making a program easily accessible seems to be a way of reaching doctors in

need of help. The counselling intervention can help doctors to evaluate their professional and private situation, and, when necessary, enhance motivation for treatment. Our prospective study will have the potential to document whether distress levels are reduced with time, and whether advice to seek treatment, given during the Sana intervention, is followed.

Abbreviations
Norwegian Medical Association (NMA)

General Practioner (GP)

Hopkin's Symptom Check List with 5 items (SCL 5)

Maslach's Burnout Inventory (MBI)

Odds Ratio (OR)

Confidence Interval (CI)

Non significant (ns)

Competing interests
The author(s) declare that they have no competing interests.

Authors' contributions
KIR has had the main responsibility for this manuscript, with study design, development of the questionnaire used, data collection with analysis and interpretation and manuscript development.

TG has contributed to study design, development of the questionnaire used, to data analysis and interpretation and to manuscript development.

OA is responsible for data collection of the comparison sample, has participated in constructing the specific questionnaire used, and has contributed to manuscript revision.

All authors read and approved of the final manuscript.

Acknowledgements

References
1. Firth-Cozens J, Greenhalgh J: **Doctors' perceptions of the links between stress and lowered clinical care.** *Social Science & Medicine* 1997, **44(7):**1017-22.
2. King MB, Cockcroft A, Gooch C: **Emotional distress in doctors: sources, effects and help sought.** *J R Soc Med* 1992, **85(10):**605-608.
3. Falkum E: **What is burnout?** *[in Norwegian: Hva er utbrenthet?]* *Tidsskrift for Den Norske Laegeforening* 2000, **120(10):**1122-8.
4. Tyssen R, Vaglum P: **Mental health problems among young doctors: an updated review of prospective studies.** *[Review] [63 refs].* *Harvard Review of Psychiatry* 2002, **10(3):**154-65.
5. Firth-Cozens J: **Depression in doctors.** In *Depression and physical illness* Edited by: Robertson MM, Katona CLE. New York: John Wiley & Sons Ltd; 1997:95-111.
6. Wall TD, Bolden RI, Borrill CS, Carter AJ, Golya DA, Hardy GE, Haynes CE, Rick JE, Shapiro DA, West MA: **Minor psychiatric disorder in NHS trust staff: occupational and gender differences.** *British Journal of Psychiatry* 1997, **171:**519-23.
7. Hem E, Haldorsen T, Aasland OG, Tyssen R, Vaglum P, Ekeberg O: **Suicide rates according to education with a particular focus on physicians in Norway 1960–2000.** *Psychological Medicine* 2005, **35(6):**873-80.
8. Lindeman S, Laara E, Hakko H, Lonnqvist J: **A systematic review on gender-specific suicide mortality in medical doctors.** *British Journal of Psychiatry* 1996, **168(3):**274-9.
9. Taylor C, Graham J, Potts HW, Richards MA, Ramirez AJ: **Changes in mental health of UK hospital consultants since the mid-1990s.** *Lancet* 2005, **366(9487):**742-4.
10. Rosvold EO, Bjertness E: **Illness behaviour among Norwegian physicians.** *Scandinavian Journal of Public Health* 2002, **30(2):**125-32.
11. Kivimaki M, Sutinen R, Elovainio M, Vahtera J, Rasanen K, Toyry S, Ferrie JE, Firth-Cozens J: **Sickness absence in hospital physicians: 2 year follow up study on determinants.** *Occupational & Environmental Medicine* 2001, **58(6):**361-6.
12. Ingstad B, Christie VM: **Encounters with illness: the perspective of the sick doctor.** *Anthropology & Medicine* 2001, **8(2/3):**201-210.
13. Tyssen R: **The physician-patient relationship when the patient is a physician.** *[in Norwegian: Lege-pasient-forholdet når pasienten også er lege]. Tidsskr Nor Laegeforen* 2001, **121(30):**3533-3535.
14. Davidson SK, Schattner PL: **Doctors' health-seeking behaviour: a questionnaire survey.** *Med J Aust* 2003, **179(6):**302-305.
15. Rosvold EO, Bjertness E: **Physicians who do not take sick leave: hazardous heroes?** *Scandinavian Journal of Public Health* 2001, **29(1):**71-5.
16. Centrella M: **Physician addiction and impairment–current thinking: a review.** *[Review] [31 refs]. Journal of Addictive Diseases* 1994, **13(1):**91-105.
17. Nelson HD, Matthews AM, Girard DE, Bloom JD: **Substance-impaired physicians probationary and voluntary treatment programs compared.** *West J Med* 1996, **165(1–2):**31-36.
18. Aasland OG: **Hospital modernista.** *[in Norwegian]. Tidsskrift for Den Norske Laegeforening* 2001, **121(30):**3638-9.
19. Roness A, Kaldestad E: **Mental disorders among physicians hospitalized in a psychiatric clinic.** *[in Norwegian Psykiske lidelser hos leger innlagt i en psykiatrisk klinikk]. Tidsskr Nor Laegeforen* 1991, **111(30):**3619-3622.
20. Silvester S, Allen H, Withey C, Morgan M, Holland WW: **The provision of medical services to sick doctors. A conspiracy of friendliness.** In *A study by the Department of public health medicinc UMDS St. Thomas Campus* Edited by: Mitchell D, Ledingham J, Ashley-Miller M. Burgess (Abingdon) Ltd, London; 1994.
21. Pitt E, Rosenthal MM, Gay TL, Lewton E: **Mental health services for residents: more important than ever.** *Acad Med* 2004, **79(9):**840-844.
22. Matthews DA, Classen DC, Willms JL, Cotton JP: **A program to help interns cope with stresses in an internal medicine residency.** *J Med Educ* 1988, **63(7):**539-547.
23. McCue JD, Sachs CL: **A stress management workshop improves residents' coping skills.** *Arch Intern Med* 1991, **151(11):**2273-2277.
24. Mushin IC, Matteson MT, Lynch EC: **Developing a resident assistance program. Beyond the support group model.** *Arch Intern Med* 1993, **153(6):**729-733.
25. Aasland OG, Olff M, Falkum E, Schweder T, Ursin H: **Health complaints and job stress in Norwegian physicians: the use of an overlapping questionnaire design.** *Social Science & Medicine* 1997, **45(11):**1615-29.
26. Gude T, Vaglum P, Tyssen R, Ekeberg O, Hem E, Rovik JO, Finset K, Gronvold NT: **Identification with the role of doctor at the end of medical school: a nationwide longitudinal study.** *Medical Education* 2005, **39(1):**66-74.

27. Sutherland VJ, Cooper CL: **Job stress, satisfaction, and mental health among general practitioners before and after introduction of newcontract.** *BMJ* 1992, **304(6841):**1545-8.
28. Tyssen R, Vaglum P, Gronvold NT, Ekeberg O: **The impact of job stress and working conditions on mental health problems among junior house officers. A nationwide Norwegian prospective cohort study.** *Medical Education* 2000, **34(5):**374-84.
29. Maslach C, Jackson SE: **The measurement of experienced burnout.** *Journal of Occupational Behavior* 1981, **2:**99-113.
30. Tambs K, Moum T: **How well can a few questionnaire items indicate anxiety and depression?** *Acta Psychiatr Scand* 1993, **87(5):**364-367.
31. Sandanger I, Moum T, Ingebrigtsen G, Sorensen T, Dalgard OS, Bruusgaard D: **The meaning and significance of caseness: the Hopkins Symptom Checklist-25 and the Composite International Diagnostic Interview. II.** *Soc Psychiatry Psychiatr Epidemiol* 1999, **34(1):**53-59.
32. Paykel ES, Myers JK, Lindenthal JJ, Tanner J: **Suicidal feelings in the general population: a prevalence study.** *British Journal of Psychiatry* 1974, **124(0):**460-9.
33. Shanafelt TD, Bradley KA, Wipf JE, Back AL: **Burnout and self-reported patient care in an internal medicine residency program.** *Ann Intern Med* 2002, **136(5):**358-367.
34. West CP, Huschka MM, Novotny PJ, Sloan JA, Kolars JC, Habermann TM, Shanafelt TD: **Association of perceived medical errors with resident distress and empathy: a prospective longitudinal study.** *JAMA* 2006, **296(9):**1071-1078.
35. Gerrity MS: **Interventions to improve physicians' well-being and patient care: a commentary.** *Social Science & Medicine* 2001, **52(2):**223-5.
36. Toyry S: **Burnout and self-reported health among finnish physicians.** In *Department of Medical Sciences* PhD-thesis. Kuopio university publications; 2005:365.
37. Hsu K, Marshall V: **Prevalence of depression and distress in a large sample of Canadian residents, interns, and fellows.** *American Journal of Psychiatry* 1987, **144(12):**1561-6.
38. Tyssen R, Rovik JO, Vaglum P, Gronvold NT, Ekeberg O: **Help-seeking for mental health problems among young physicians: is it the most ill that seeks help? – A longitudinal and nationwide study.** *Social Psychiatry & Psychiatric Epidemiology* 2004, **39(12):**989-93.
39. Grassi L, Magnani K: **Psychiatric morbidity and burnout in the medical profession: an Italian study of general practitioners and hospital physicians.** *Psychotherapy & Psychosomatics* 2000, **69(6):**329-34.
40. Olkinuora M, Asp S, Juntunen J, Kauttu K, Strid L, Aarimaa M: **Stress symptoms, burnout and suicidal thoughts in Finnish physicians.** *Social Psychiatry & Psychiatric Epidemiology* 1990, **25(2):**81-6.
41. Davis DA, Mazmanian PE, Fordis M, Van Harrison R, Thorpe KE, Perrier L: **Accuracy of physician self-assessment compared with observed measures of competence: a systematic review.** *JAMA* 2006, **296(9):**1094-1102.

Pre-publication history

The pre-publication history for this paper can be accessed here:

http://www.biomedcentral.com/1471-2458/7/36/prepub

II

Counselling for burnout in Norwegian doctors: one year cohort study

Karin E Isaksson Rø, medical doctor,[1,2] Tore Gude, professor,[1,2] Reidar Tyssen, associate professor ,[2] Olaf G Aasland, director, professor[3,4]

[1]Research Institute, Modum Bad, NO-3370 Vikersund, Norway

[2]Department of Behavioural Sciences in Medicine, Institute of Basic Medical Sciences, Faculty of Medicine, University of Oslo, PO Box 1111 Blindern, NO-0317 Oslo, Norway

[3]Research Institute of the Norwegian Medical Association, PO Box 1152 Sentrum, NO-0107 Oslo, Norway

[4]Institute of Health Management and Health Economics, University of Oslo, Norway

Correspondence to: K Isaksson Rø
karin.roe@modum-bad.no

ABSTRACT

Objective To investigate levels and predictors of change in dimensions of burnout after an intervention for stressed doctors.

Design Cohort study followed by self reported assessment at one year.

Setting Norwegian resource centre.

Participants 227 doctors participating in counselling intervention, 2003-5.

Interventions Counselling (lasting one day (individual) or one week (group based)) aimed at motivating reflection on and acknowledgement of the doctors' situation and personal needs.

Main outcome measures Levels of burnout (Maslach burnout inventory) and predictors of reduction in emotional exhaustion investigated by linear regression.

Results 185 doctors (81%, 88 men, 97 women) completed one year follow-up. The mean level of emotional exhaustion (scale 1-5) was significantly reduced from 3.00 (SD 0.94) to 2.53 (SD 0.76) (t=6.76, P<0.001), similar to the level found in a representative sample of 390 Norwegian doctors. Participants had reduced their working hours by 1.6 hours/week (SD 11.4). There was a considerable reduction in the proportion of doctors on full time sick leave, from 35% (63/182) at baseline to 6% (10/182) at follow-up and a parallel increase in the proportion who had undergone psychotherapy, from 20% (36/182) to 53% (97/182). In the whole cohort, reduction in emotional exhaustion was independently associated with reduced number of work hours/week (β=0.17, P=0.03), adjusted for sex, age, and personality dimensions. Among men "satisfaction with the intervention" (β=0.25, P=0.04) independently predicted reduction in emotional exhaustion.

Conclusions A short term counselling intervention could contribute to reduction in emotional exhaustion in doctors. This was associated with reduced working hours for the whole cohort and, in men, was predicted by satisfaction with the intervention.

INTRODUCTION

Research on the mental health of doctors has led to a call for preventive interventions to lower the risk of burnout and mental distress.[1-4] The importance of early intervention is underlined by the high prevalence of depression[5 6] and suicide[7-9] in doctors compared with other groups and by their reluctance to seek help.[10-13] Doctors who work with reduced levels of functioning can be harmful to themselves, their coworkers, and patients.[1 14-17]

Early intervention programmes could ensure that practising doctors in trouble get help in time, before their problems interfere with care of patients and give rise to medical errors,[14 16] but such programmes have been poorly investigated. McCue and Sachs found reduced emotional exhaustion (one of the three dimensions in the Maslach burnout inventory) six weeks after a group intervention for young doctors,[18] and Holt and Del Mar found reduced levels of mental distress measured with the general health questionnaire three months after they sent an intervention to general practitioners.[19] These results emphasise the need for further long term follow-up studies to determine which factors contribute to positive changes.

Doctors in danger of reduced wellbeing or functioning might need diverse interventional approaches.[4 20] Individual (sex,[5 6 21-23] age, personality traits[24]) and contextual factors (marital status, caring for children, job stress, and number of work hours[25]) contribute to risk. The impact of different types of stressors can vary with sex,[26] and it is therefore important to investigate whether men and women benefit from different elements in an intervention.

Doctors are reluctant to seek help and often need prompting by colleagues or legislative pressure to do so.[10-12] It is important to look at the effects of a short term intervention in doctors who are prompted to attend compared with those who attend on their own initiative.

A resource centre in Norway (Villa Sana) offers a counselling programme designed to prevent burnout, enhance mental health and quality of life, and strengthen professional awareness and identity. The self referral counselling intervention aims to motivate doctors to reflect on and acknowledge their own situation and personal needs. This might subsequently lead to them seeking medical treatment, reducing working hours, and reconsidering personal and professional priorities.[27]

In a previous cross sectional study doctors participating in this counselling programme reported a high degree of satisfaction with the intervention.[10 28] The association between satisfaction and outcome is fairly high.[29]

In a previous study we found that doctors entering the programmes had significantly higher levels of emotional exhaustion, mental distress, and job stress than Norwegian doctors in general.[27] We studied the same cohort and carried out assessments before, immediately after, and about one year after the intervention to examine various factors associated with burnout (see box).

Questions examined in study

- Will levels of burnout dimensions change from baseline to follow-up, and will levels of mental distress, job stress, treatment (with a general practitioner, with a psychotherapist, or with antidepressants), sick leave, or number of work hours per week vary in the same time span?

- How will levels of burnout, job stress, and mental distress at follow-up differ from representative data for Norwegian doctors?

- Is change in emotional exhaustion (one dimension of burnout) from baseline to follow-up:

  Predicted by age, sex, personality, route of contact, or satisfaction with the intervention?

  Associated with seeking treatment, coming back for additional counselling, being on sick leave, starting use of antidepressants, or reducing number of work hours per week during the year after the intervention?

METHODS

Study design

We included doctors consecutively attending the resource centre for a counselling intervention from August 2003 to July 2005. They completed self reported assessments in the four weeks before (baseline) and the three weeks after (intervention satisfaction) baseline intervention. Fifty three weeks (SD 6.4, range 40-70 weeks) after the intervention, they completed follow-up questionnaires, posted in eight groups (two reminders given) from autumn 2004 to spring 2006. The data were compared with data from a survey of Norwegian doctors in 2003. Baseline data indicated that the intervention programmes reached doctors in need of help as reported previously.[27]

Sample

The mean age of included doctors was 46.9 (45.0 among practising Norwegian doctors in 2004-5), and 48% of the sample were men (64%). More details are available elsewhere.[27]

The figure shows the flow of doctors participating in the study. Initially, 187 doctors came to the single day session and 40 came to the one week course. Of the follow-up sample of 185 doctors, within the year after

baseline 19 had an additional one day session and 51 had an additional course; of these 53% returned within the first eight weeks and 91% within the first six months. Seventy (38%) doctors attending the initial intervention and 12 (6%) attending a follow-up intervention brought their spouse. The interventions were basically similar for doctors with or without spouses. We examined attendance at only one session or at two sessions during the year as a predictor for reduced emotional exhaustion. Further subdivisions of the sample, according to intervention types and combinations of interventions, resulted in small subgroups that are difficult to analyse meaningfully.

Setting

The resource centre is open to all Norwegian doctors and was initiated in cooperation between the Norwegian Medical Association and Modum Bad psychiatric hospital. Although it is a self referral centre, some doctors reported being prompted (and some were even referred) to come by their general practitioner or another colleague.

Intervention

The interventions were based on an integrative approach with psychodynamic, cognitive, educational, and motivational interviewing theories. Doctors chose one of two interventions.

Single day counselling session—Individual doctors underwent one session, lasting six to seven hours, with a psychiatrist or a specialist in occupational health. The counselling had a common structure, irrespective of counsellor. The intervention was completely confidential and did not use medical records. Doctors were invited to describe their situation including contextual factors, both related to the job and otherwise. The counsellor investigated sources of identity, self esteem, and self reliance and identified, acknowledged, and challenged present coping strategies. The doctors' present needs in the short and longer term were focused on, and they were often advised to acknowledge these needs (for example, for treatment).

Week long course—These courses consisted of sessions for eight participants led by one of the same counsellors in collaboration with an occupational therapist. A daily lecture (90 minutes) introduced themes of possibilities and restraints in working life, the individuals' resources and personality with concepts of identity, communication at work and in private, team work, and prevention of burnout. This was followed by group discussions (90 minutes) based on the participants' own experiences, providing the opportunity to share these issues with colleagues. Doctors could do daily physical activity (75 to 360 minutes) and one session of individual counselling (60 minutes) during the week. The programme is fully described elsewhere.[27]

Comparison sample

We compared our participating doctors with a sample of Norwegian doctors, all of whom had graduated in
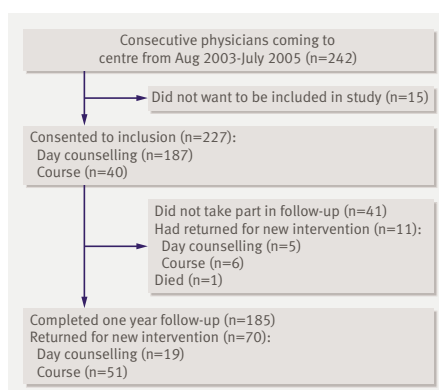
Participation in study at baseline and at follow-up

Norway in 1993-4. The data we used were collected at the 10 year follow-up in 2003 (n=390).[25 30] Age and sex differences were controlled for.

Our main outcome variables were changes in dimensions of burnout, mental distress, and job stress. We used regression analysis to examine prediction of change in emotional exhaustion by individual factors, satisfaction with the intervention, and changes made after the intervention, including potential confounding.

Data at baseline and immediately after intervention

Demographic data and personality—We collected data on sex, age, marital status, and having children under 16 years (dichotomous variable). We used Eysenck's personality questionnaire with six items from the neuroticism scale and six from the introvert-extrovert scale.[31] The scales explain 82% and 83% variance, respectively, of the original scales. Cronbach's α was

0.70 and 0.80, respectively. We scored items dichotomously (1=yes or 0=no) and obtained a sum score between 1 and 6 for each dimension, with higher scores indicating more neuroticism or being more extrovert.

Contact with resource centre—To determine how doctors originally contacted the centre we dichotomised answers into prompted by own general practitioner or another doctor or referred (1) and attending on own initiative (2). For the amount of contact, we dichotomised into one intervention (1) and two interventions (2)

Satisfaction with intervention—We used questions on satisfaction developed by the Research Institute of the Norwegian Medical Association to evaluate services at the centre after the two first years of services[28]: "How high were your expectations of the counselling session?" scored on a five point scale from very small (1) to very high (5); "Did the counselling session correspond to your expectations?" scored on a five point scale from not at all (1) to corresponded completely to expectations, including "better than expected" (5); "Did the counselling session help to clarify important factors in your situation?" scored on a four point scale from not at all (1) to a substantial degree (4); "Do you feel more able to handle your problems after the counselling session?" scored on a three point scale from no (1) to a bit more able (2), to much more able (3).

Outcome variables at baseline and follow-up

Burnout—We used Maslach's burnout inventory with three subscales: emotional exhaustion (10 items), depersonalisation/cynicism (8 items), and reduced personal accomplishment (7 items). Cronbach's α was 0.92, 0.69, and 0.71, respectively. As in previous studies of Norwegian doctors,[32] we used a five point scale (1=does not fit, 5=fits very well), with reference to the last two weeks at work, as the original frequency

Table 1 | Individual variables, route of attendance, personality dimensions, and satisfaction with intervention for 185 doctors after participation in counselling intervention for burnout. Figures are means (SD) or numbers of participants (%, 95% confidence interval)

	Men (n=88)	Women (n=97)
Age (years)	49.4 (9.0)	44.7 (8.2)
Married/cohabiting	76/88 (86.4, 79.2 to 93.6)	74/97 (76.3, 66.8 to 86.0)
Have children aged <16 years	38/88 (43.2, 32.9 to 53.5)	47/97 (48.5, 38.6 to 58.4)
Prompted by doctor to come to counselling	27/88 (30.7, 21.1 to 40.3)	42/97 (43.3, 33.4 to 53.2)
Personality dimension:		
Neuroticism (1-6)	2.85 (1.87)	2.51 (1.76)
Extroversion (1-6)	3.41 (2.16)	3.98 (1.87)
How high were expectations to counselling session? (1-5)	3.77 (0.66)*	3.72 (0.70)†
Were expectations to counselling session fulfilled? (1-5)	4.50 (0.61)*	4.44 (0.63)†
Counselling contributed to clarify important factors (1-4)	3.63 (0.64)*	3.53 (0.57)†
Felt more able to handle problems after counselling (1-3)	2.39 (0.49)*	2.37 (0.56)†

*n=69/70.
†n=79/81.

Table 2 | Comparison between doctors at baseline who completed and who did not complete follow-up. Figures are means (SD) or numbers of participants (%; 95% confidence interval)

	Completed follow-up (n=181-185)	Did not complete follow-up (n=41-42)	Level of significance
Age (years)	47.0 (8.9)	46.8 (9.5)	−0.07,* P=0.94
Men	88/185 (47.6; 40.0 to 54.8)	22/42 (52.4; 37.3 to 67.5)	0.32,† P=0.57
SCL5 (1-5)	2.83 (1.09)	3.06 (1.15)	1.18,* P=0.24
Maslach burnout inventory:			
Emotional exhaustion (1-5)	3.03 (0.94)	3.25 (0.94)	1.37,* P=0.17
Depersonalisation (1-5)	1.90 (0.56)	2.00 (0.56)	1.06,* P=0.29
Reduced personal accomplishment (1-5)	2.30 (0.51)	2.19 (0.50)	−1.24,* P=0.21
Total job stress (1-5)	2.42 (0.71)	2.52 (0.77)	0.85,* P=0.39
Use of antidepressants	35/183 (19; 13.3 to 24.7)	16/41 (38; 23.1 to 52.9)	7.01,† P=0.008

*t test for continuous variables
†χ² for dichotomous variables.

scale has been criticised for having categories that are not mutually exclusive.[33] Personal accomplishment was presented with a reverse scale, so that high values meant low levels of accomplishment. We dichotomised emotional exhaustion into high and low, with scores above 3 indicating caseness.[32]

Measure of mental distress—We used Hopkins symptom checklist with five items (SCL5), which is a shortened version of SCL25 (based on SCL90R[34]), a widely used instrument designed to measure mental distress, mainly symptoms of anxiety and depression in population surveys.[34 35] The correlation between SCL5 and SCL25 was 0.91.[34] Cronbach's α was 0.90. The five point scale (1=not at all, 5=very much) evaluating the last two weeks has been used in previous studies of Norwegian doctors.[36 37] The measure was also dichotomised, with scores above 2.09 for men and 2.19 for women denoting cases in potential need of treatment.[27]

Perceived job stress—The modified version of the Cooper job stress questionnaire (Cooper, 32 items, self report,[26] modified by Tyssen et al[38]) consisted of 17 items from a principal component analysis of data from the Norwegian student/doctor cohort[38] in addition to nine clinically prompted items from the questionnaire.[27] Cronbach's α for the full 26 item instrument (job stress as reported in this paper) was 0.90, summing up scales for emotional distress (10

items), work-home interface stress (10 items), and fear of litigation (six items). Scores were given on a five point scale (1=no stress, 5=a lot of stress) with reference to the last two weeks at work.

Sick leave—We calculated number of weeks on full time or part time sick leave or rehabilitation or disability during the preceding year and recorded current status.

Treatment—We recorded if the doctor was being treated by a general practitioner, if they used antidepressants, and if they were in psychotherapy with a psychiatrist or a psychologist.

Working hours—Working hours were the total hours a week of direct contact with patients, meetings, paperwork, on the telephone, research, and "other work activities." To determine individually initiated reduction of work hours after the intervention we calculated work hours a week at baseline minus work hours a week at follow-up reported continuously and dichotomised (1=reduction, 0=no change or increase).

Statistics

We calculated means, frequencies, and Pearson's product moment correlations. Continuous variables were analysed with *t* test (for independent and paired samples) or Mann-Whitney U test for independent samples and Wilcoxon's rank test for paired samples.

Table 3 | Burnout, mental distress, and job stress at baseline and at one year follow-up in cohort of doctors participating in counselling for burnout. Figures are means (SD) or numbers of participants (%; 95% confidence interval)

	Baseline	One year follow-up	Difference	Paired *t* test	P value
Maslach burnout inventory:					
Emotional exhaustion (1-5) (n=168)	3.00 (0.94)	2.53 (0.76)	0.47 (0.91)	6.76	‹0.001
Emotional exhaustion: score indicates caseness (›3)	76 (45.2; 37.7 to 52.7)	41 (24.4; 17.9 to 30.0)	35 (20.8; 14.7 to 26.9)	—	‹0.001*
Depersonalisation/cynicism (1-5) (n=166)	1.90 (0.57)	1.75 (0.52)	0.16 (0.50)	4.02	‹0.001
Reduced personal accomplishment (1-5) (n=168)	2.29 (0.49)	2.25 (0.52)	0.03 (0.51)	0.80	0.43
SCL5 (Hopkins symptom checklist:					
Score (1-5) (n=181)	2.84 (1.08)	2.07 (0.92)	0.77 (0.96)	10.73	‹0.001
Score indicates caseness	131/181 (72.3; 65.8 to 78.8)	73/181 (40.3; 33.1 to 47.4)	58/181 (32; 25.2 to 38.8)	—	‹0.001*
Total job stress:					
Score (1-5) (n=177)	2.40 (0.70)	1.97 (0.61)	0.43 (0.67)	8.52	‹0.001

*McNemar.

Dichotomous variables were analysed with χ^2 or McNemar's test for repeated measures. We used analysis of covariance to compare means between the present sample and the representative sample of Norwegian doctors.

We tested prediction of reduction in emotional exhaustion with linear regression. In a multivariate model with sex and age we included significant bivariate associations with preceding predictors (personality dimensions, marital status, having children aged under 16, way of contact, satisfaction with the intervention) and concurrent predictors (such as starting psychotherapy, taking sick leave, starting antidepressants, reduced working hours, and returning for an additional counselling session during follow-up). We examined interactions between sex and significant predictors and also performed separate analyses by sex. Results are reported as standardised β values.

Missing data

The variables for satisfaction with the intervention were missing for 34 individuals. There were no significant differences in demographic or distress variables between the groups with and without missing variables so inclusion should not reduce the internal validity.

When one or a few items were missing in an instrument we used the mean score of completed items. Some of the items in the Maslach burnout inventory and in job stress were not relevant for all respondents because of differences in working conditions (not working directly with patients such as in laboratory work, leadership, research). Mean scores of remaining items were used. Instruments with all items missing reduced the number in the relevant analyses (this concerned three to four instruments at baseline

and four to 15 instruments at follow-up). For all analyses we used SPSS 15.0.

RESULTS

The cohort comprised 227 doctors (94% of 242 eligible). Of these, 88 men and 97 women (185, 81%) completed follow-up, three did not want to be assessed, one had died, and 38 gave no response (figure).

Table 1 shows the demographic variables, personality dimensions, route of attendance, and satisfaction with the intervention for doctors who completed follow-up. The expectations of the intervention were generally high: 52/149 (35%) had medium high, 80/149 (54%) quite high, and 17/149 (11%) very high expectations. Further baseline data, including a comparison with Norwegian doctors in general, have been presented previously.[27]

We found no significant differences in age, sex, or stress levels at baseline between those who completed and those who did not complete follow-up assessments (table 2). A higher proportion of those who did not complete follow-up were taking antidepressants at baseline.

Levels of burnout (emotional exhaustion), mental distress (SCL5), and job stress were significantly lower at one year follow-up than at baseline (table 3). There were no significant differences in these changes according to sex, route of attendance, or with attending one or two interventions during the year. There was a significant reduction in the proportion of the cohort above levels indicating burnout in relation to emotional exhaustion and need for treatment in relation to SCL5 at follow-up (table 3).

The proportion of doctors who had undergone psychotherapy increased substantially, from 20% at baseline to 53% in the year after the intervention (table 4). The

Table 4 | Proportion of doctors receiving treatment and on sick leave at baseline and follow-up, number of weeks of sick leave during preceding year, and working hours among those participating in counselling for burnout. Percentages with 95% confidence intervals shown in parentheses

	Baseline	One year follow-up	P value
No (%) (McNemar's test):			
In treatment with general practitioner at present	68/173 (39.3; 32.0 to 46.6)	69/173 (39.9; 32.6 to 47.2)	0.991
In psychotherapy at some point during past year	36/182 (19.8; 14.0 to 25.6)	97/182 (53.3; 46.1 to 60.1)	<0.001
Taking antidepressants	34/175 (19.4; 13.5 to 25.3)	31/175 (17.7; 12.0 to 23.4)	0.72
Full time sick leave	63/182 (34.6; 27.4 to 41.2)	10/182 (5.5; 2.2 to 8.8)	<0.001
Part time sick leave	7/182 (3.8; 1.0 to 6.6)	11/182 (6.0; 2.5 to 9.5)	0.48
Full time disability/rehabilitation benefits	1/182 (0.5; −0.5 to 1.5)	10/182 (5.5; 2.2 to 8.8)	0.004
Part time disability/rehabilitation benefits	3/182 (1.6; −0.2 to 3.4)	2/182 (1.1; −0.4 to 2.6)	0.99
Mean (SD) (Wilcoxon rank test)			
No of weeks on full time sick leave in preceding year (n=162)*	4.0 (6.9)	8.0 (13.7)	z=−3.39, 0.001
No of weeks on full time sick leave/disability or rehabilitation benefits in preceding year (n=167)	4.4 (7.9)	8.5 (14.4)	z=−3.29, 0.001
Working hours/week (n=165)	43.6 (7.9)	42.0 (12.1)	z=2.25, 0.03
Working hours/week for doctors who reduced working hours after baseline (n=81)	46.0 (7.6)	37.7 (10.9)	z=−7.82, <0.001
Working hours/week for doctors who did not reduce working hours after baseline (n=84)	41.3 (7.6)	46.0 (11.9)	z=6.75, <0.001

*Not including those on disability/rehabilitation benefits or retired at follow-up.

Table 5 | Doctors at one year follow-up compared with Norwegian doctors surveyed in 2003, controlled for sex and age. Figures are means of estimated marginal (95% confidence interval of standard error)

	Doctors at follow-up (n=170/185)	Norwegian doctors 2003 (n=390)	F, P value
Emotional exhaustion (1-5)	2.52 (2.39 to 2.65)	2.47 (2.38 to 2.57)	F=0.24, 0.62 (0.05*)
SCL5 (1-5)	2.12 (1.99 to 2.49)	1.54 (1.43 to 1.64)	F=39.56, ‹0.001
Total job stress (1-5)	1.99 (1.89 to 2.09)	2.20 (2.13 to 2.28)	F=9.54, 0.002 (0.01*)

*For independent sex effect.

number of weeks on sick leave in the preceding year and proportion of physicians receiving disability or rehabilitation benefits increased after the intervention, whereas the proportion of physicians on current full time sick leave was substantially lower at follow-up (6% v 35%, table 4). A higher proportion of women were on full time sick leave at baseline: 35/86 (41%, 95% confidence interval 31% to 51%) v 18/80 men (22%, 10% to 26%), P=0.01. There were no significant sex differences at follow-up.

The numbers of hours worked a week in the cohort at baseline was not significantly different from that of the representative survey of doctors in 2003[25] (43.4 (SD 7.90) v 43.6 (SD 8.14), P=0.12). Participating doctors reduced their working hours by a mean of 1.6 hours a week at follow-up (table 4). Compared with women, men worked a higher average number of hours a week at baseline: 45.1 hours (SD 7.58) v 42.0 hours (SD 7.94) (P=0.01). This difference disappeared at follow-up.

Compared with Norwegian doctors surveyed in 2003, the follow-up sample had lower or non-significantly different levels of emotional exhaustion and total job stress but still had significantly higher values on the Hopkins symptom checklist, adjusted for age and sex (table 5).

We found significant bivariate associations for the whole sample between reduction in emotional exhaustion and a linear function of age ($\beta=-0.16$, P=0.04; younger doctors have a greater reduction), neuroticism ($\beta=0.29$, P<0.001), extroversion ($\beta=-0.23$, P=0.003; more introversion gives more reduction), and reduction of work hours ($\beta=0.21$, P=0.01). The significant effects maintained in the multivariate model were from neuroticism, with 8.7% explained variance ($\beta=0.23$, P=0.005), extroversion, with an additional 3.7% explained variance ($\beta=-0.20$, P=0.01), and reduction of work hours, with an additional 2.7% explained variance ($\beta=0.17$, P=0.03), n=158.

There were no interactions between sex and significant predictors. Among men, reduction in emotional exhaustion was associated with neuroticism ($\beta=0.39$, P<0.001), extroversion ($\beta=-0.32$, P=0.004), satisfaction with the intervention ("did the counselling session correspond to your expectations?") ($\beta=0.27$, P=0.04), and reduction of work hours ($\beta=0.25$, P=0.03). The significant effects maintained in the multivariate model were from neuroticism, with 17.5% explained variance ($\beta=0.32$, P=0.02), and satisfaction with the intervention, with an additional 6.5% explained variance ($\beta=0.25$, P=0.04), n=58.

There were no bivariate associations among women.

DISCUSSION

Principal findings

One year after a counselling intervention initially stressed doctors reported a reduction in emotional exhaustion (burnout) and job stress to the levels found in a representative sample of Norwegian doctors. The substantial reduction in the proportion of those in need of treatment according to SCL5 and in burnout (emotional exhaustion) underlines the clinical relevance of this improvement in wellbeing. After adjustment for sex, age, and the personality dimensions of neuroticism and introversion, reduced emotional exhaustion was associated with "reduction of work hours" after the intervention in the whole cohort. Among men reduction in emotional exhaustion was also predicted by satisfaction with the intervention (that is, "the counselling intervention corresponded to my expectations," where reported expectations generally were high), indicating that the observed reduction in distress could be related to the intervention.

The considerable reduction in full time sick leave at follow-up compared with baseline, together with a relatively modest reduction in weekly work hours (less than two hours), supports the notion that the intervention had a positive impact on the working capacity of the doctors. Relatively small adjustments might thus have had considerable impact on their mental health and functioning at work. Further investigation could determine whether this was caused by, or mediated through, the increase in number of weeks on sick leave after the intervention or the fact that more doctors sought psychotherapy.

Strengths and weaknesses

The longitudinal design with one year follow-up and the comparison with a representative sample of Norwegian doctors are strengths in this study. The high proportion of participants who completed follow-up (81%) strengthens the internal reliability of the results.

The validity of the self reported findings is strengthened by our adjustment for neuroticism, which can influence the perception of distress variables towards reporting negatively (so called negative affectivity).[39]

The non-significant differences in reduction of distress parameters for doctors prompted ("referred") by a colleague compared with attending on their own initiative strengthens the generalisability of the results as previous studies show that doctors often need prompting or referral to health services.[3-41]

The study has several limitations, principally the opportunistic design that impedes determination of a causal relation to the intervention, because of spontaneous regression towards the mean, or to other factors not assessed in this study. The regression analysis, however, indicates an association between intervention and outcome.

We did not find any association between the change in stress levels and attending an additional intervention during follow-up, which increases the generalisability of the study. The lack of further analyses of subgroups

WHAT IS ALREADY KNOWN ON THIS TOPIC

Previous research on doctors' mental health has documented need for interventions to prevent burnout and distress

Few evaluations of such interventions have been published, and follow-up times have been short

WHAT THIS STUDY ADDS

A short term counselling intervention could contribute to reduction of emotional exhaustion (one dimension of burnout)

Reduction in emotional exhaustion was associated with reduction in working hours, and, among men, satisfaction with the intervention predicted reduction in exhaustion

according to intervention types and combinations of interventions could, however, give a false negative finding (type II error). The regression analyses for each sex are also subject to possible type II errors. Near significant associations found should be studied in larger samples to ascertain sex differences. Recall bias, especially concerning sick leave and working hours during the preceding year, could be an issue, and objective measures could have given more accurate estimates. More of the participants lost to follow-up reported taking antidepressants at baseline, but as this does not correspond with significantly higher distress rates at baseline we consider it of minor importance to the results.

Strengths and weaknesses in relation to other studies

Previous intervention studies have shown a reduction in emotional exhaustion and in scores on the general health questionnaire after short follow-up periods (six weeks, three months), and they describe educational group interventions,[18][19] whereas the programmes we studied used individual counselling (as well as group sessions) and a one year follow-up period. Comparisons are therefore difficult.

High expectations and demands of capacity and ability to cope, combined with a low acceptance of personal needs,[5][42] has led to a reluctance among doctors to seek treatment, especially for mental distress.[10][11][23][26] In accordance with this, a study of a self referral specialist service for doctors in England[43] as well as the cross sectional study of our programmes[27] suggest that such services can lead to earlier engagement, thus "enhancing the possibility of nipping problems in the bud."[43] The increase after the intervention in treatment seeking indicates increased acknowledgment (possibly perception) and acceptance of personal needs, and perception of high levels of emotional distress has been shown to predict professional help seeking.[44]

The personality dimensions of neuroticism and introversion predict burnout in doctors[24][45] but are also important for functioning well. Self criticism, closely related to neuroticism, is associated both with depressive symptoms as well as with a higher capacity for empathy.[46] Support related to these personality dimensions would thus help doctors towards sound mental health in combination with good performance and empathic ability.[47]

The relation between work hours and perceived stress is ambiguous in Norwegian studies.[10][25][38] Work hours vary between countries, with longer average hours in the United States[48] and in the United Kingdom than in Norway. A potential mediator between work hours and burnout has been suggested to be the "fit," defined as "the extent to which workers realize . . . their plans for optimizing their own work—and non-work needs."[49] Fit will necessarily be influenced by the norms of the particular society. This could explain the positive impact of reduced working hours on reduction in emotional exhaustion as seen in the US[48][50] after the implementation of duty hour standards as well as after the individually initiated reduction in work hours found in our study.

Male doctors have previously reported more stress caused by job demands,[26] whereas female doctors have reported more stress related to the work-home interface,[26][51] and women value social support at work more.[52] The sex differences regarding the importance of reduced working hours and satisfaction with the intervention (among men but not among women) could indicate that the chosen outcome variables did not adequately reflect the more complex matters involved in assessing the relation between the observed reduction in emotional exhaustion and multiple factors in the work-home interface[51] and social relations at work.[25] Further investigations of sex differences are important to tailor relevant interventions.

Possible explanations and implications

Our findings indicate that seeking a counselling intervention could be conducive to reduction of burnout among doctors. Considering doctors' reluctance to seek help, despite high levels of distress, it is important to offer interventions that facilitate access and that can enhance motivation to reconsider personal and professional priorities when necessary.

Unanswered questions and future research

This study is a preliminary study examining the associations between the alleviation of burnout and a counselling intervention. The indications of factors possibly contributing to reduction in emotional exhaustion need to be further investigated with a more controlled design.

research committee in the south of Norway did not consider consent necessary for this study. All doctors gave written informed consent.
Provenance and peer review: Not commissioned; externally peer reviewed.

1 Firth-Cozens J. Interventions to improve physicians' well-being and patient care. *Soc Sci Med* 2001;52:215-22.
2 Linzer M, Konrad TR, Douglas J, McMurray JE, Pathman DE, Williams ES, et al. Managed care, time pressure, and physician job satisfaction: results from the physician worklife study. *J Gen Intern Med* 2000;15:441-50.
3 Taub S, Morin K, Goldrich MS, Ray P, Benjamin R, Council on Ethical and Judicial Affairs of the American Medical Association. Physician health and wellness. *Occup Med* 2006;56:77-82.
4 Schattner P, Davidson S, Serry N. Doctors' health and wellbeing: taking up the challenge in Australia. Promoting psychological wellness in doctors requires tailored interventions. *Med J Aust* 2004;181:348-9.
5 Firth-Cozens J. Depression in doctors. In: Robertson MM, Katona CLE, eds. *Depression and physical illness*. New York: John Wiley, 1997:95-111.
6 Wall TD, Bolden RI, Borrill CS, Carter AJ, Golya DA, Hardy GE, et al. Minor psychiatric disorder in NHS trust staff: occupational and gender differences. *Br J Psychiatry* 1997;171:519-23.
7 Lindeman S, Laara E, Hakko H, Lonnqvist J. A systematic review on gender-specific suicide mortality in medical doctors. *Br J Psychiatry* 1996;168:274-9.
8 Hem E, Haldorsen T, Aasland OG, Tyssen R, Vaglum P, Ekeberg O. Suicide rates according to education with a particular focus on physicians in Norway 1960-2000. *Psychol Med* 2005;35:873-80.
9 Schernhammer ES, Colditz GA. Suicide rates among physicians: a quantitative and gender assessment (meta-analysis). *Am J Psychiatry* 2004;161:2295-302.
10 Tyssen R. Health problems and the use of health services among physicians: a review article with particular emphasis on Norwegian studies. *Ind Health* 2007;45:599-610.
11 Sivertz K. When physicians need admission to a psychiatric unit. *B C Med J* 1998;40:156-8.
12 Rosvold EO, Bjertness E. Illness behaviour among Norwegian physicians. *Scand J Public Health* 2002;30:125-32.
13 Kivimaki M, Sutinen R, Elovainio M, Vahtera J, Rasanen K, Toyry S, et al. Sickness absence in hospital physicians: 2 year follow up study on determinants. *Occup Environ Med* 2001;58:361-6.
14 Fahrenkopf AM, Sectish TC, Barger LK, Sharek PJ, Lewin D, Chiang VW, et al. Rates of medication errors among depressed and burnt out residents: prospective cohort study. *BMJ* 2008;336:488-91.
15 Shanafelt TD, Bradley KA, Wipf JE, Back AL. Burnout and self-reported patient care in an internal medicine residency program. *Ann Intern Med* 2002;136:358-67.
16 West CP, Huschka MM, Novotny PJ, Sloan JA, Kolars JC, Habermann TM, et al. Association of perceived medical errors with resident distress and empathy: a prospective longitudinal study. *JAMA* 2006;296:1071-8.
17 DiMatteo MR, Sherbourne CD, Hays RD, Ordway L, Kravitz RL, McGlynn EA, et al. Physicians' characteristics influence patients' adherence to medical treatment: results from the medical outcomes study. *Health Psychol* 1993;12:93-102.
18 McCue JD, Sachs CL. A stress management workshop improves residents' coping skills. *Arch Intern Med* 1991;151:2273-7.
19 Holt J, Del Mar C. Reducing occupational psychological distress: a randomized controlled trial of a mailed intervention. *Health Educ Res* 2006;21:501-7.
20 Cohen D, Rollnick S, Smail S, Kinnersley P, Houston H, Edwards K. Communication, stress and distress: evolution of an individual support programme for medical students and doctors. *Med Educ* 2005;39:476-81.
21 Hem E, Gronvold NT, Aasland OG, Ekeberg O. The prevalence of suicidal ideation and suicidal attempts among Norwegian physicians. Results from a cross-sectional survey of a nationwide sample. *Eur Psychiatry* 2000;15:183-9.
22 Hsu K, Marshall V. Prevalence of depression and distress in a large sample of Canadian residents, interns, and fellows. *Am J Psychiatry* 1987;144:1561-6.
23 King MB, Cockcroft A, Gooch C. Emotional distress in doctors: sources, effects and help sought. *J R Soc Med* 1992;85:605-8.
24 McManus IC, Keeling A, Paice E. Stress, burnout and doctors' attitudes to work are determined by personality and learning style: a twelve year longitudinal study of UK medical graduates. *BMC Med* 2004;2:29.
25 Rovik JO, Tyssen R, Hem E, Gude T, Ekeberg O, Moum T et al. Job stress in young physicians with an emphasis on the work-home interface: a nine-year, nationwide and longitudinal study of its course and predictors. *Ind Health* 2007;45:662-71.
26 Cooper CL, Rout U, Faragher B. Mental health, job satisfaction, and job stress among general practitioners. *BMJ* 1989;298:366-70.
27 Ro KE, Gude T, Aasland OG. Does a self-referral counselling program reach doctors in need of help? A comparison with the general Norwegian doctor workforce. *BMC Public Health* 2007;7:36.
28 Falkum E. *Evaluering av virksomheten ved Ressurssenter for leger fra 1.oktober 1998 til 1. august 2000*. [Evaluation of the Resource centre for medical doctors from 1st of October 1998 til 1st of August 2000.] Oslo: Research Institute, Norwegian Medical Association, 2001. (In Norwegian.)
29 Hall JA, Dornan MC. What patients like about their medical care and how often they are asked: a meta-analysis of the satisfaction literature. *Soc Sci Med* 1988;27:935-9.
30 Hem E, Stokke G, Tyssen R, Gronvold NT, Vaglum P, Ekeberg O. Self-prescribing among young Norwegian doctors: a nine-year follow-up study of a nationwide sample. *BMC Med* 2005;3:16.
31 Francis LJ, Brown LB, Philipchalk R. The development of an abbreviated form of the revised Eysenck personality questionnaire (EPQR-A): its use among students in England, Canada, the USA and Australia. *Pers Individ Diff* 1992;13:443-9.
32 Falkum E. Hva er utbrenthet? [What is burnout?] *Tidsskr Nor Laegeforen* 2000;120:1122-8. (In Norwegian.)
33 Barnett RC, Brennan RT, Gareis KC. A closer look at the measurement of burnout. *J Appl Biobehav Res* 1999;4:65-78.
34 Strand BH, Dalgard OS, Tambs K, Rognerud M. Measuring the mental health status of the Norwegian population: a comparison of the instruments SCL-25, SCL-10, SCL-5 and MHI-5 (SF-36). *Nord J Psychiatry* 2003;57:113-8.
35 Tambs K, Moum T. How well can a few questionnaire items indicate anxiety and depression? *Acta Psychiatr Scand* 1993;87:364-7.
36 Aasland OG, Falkum E. Legekårsundersøkelsen. Responsen på spørreskjema-undersøkelsen. [A study of the medical society. The response to a questionnaire survey.] *Tidsskr Nor Laegeforen* 1994;114:3052-8. (In Norwegian.)
37 Tyssen R, Vaglum P, Aasland OG, Gronvold NT, Ekeberg O. Use of alcohol to cope with tension, and its relation to gender, years in medical school and hazardous drinking: a study of two nation-wide Norwegian samples of medical students. *Addiction* 1998;93:1341-9.
38 Tyssen R, Vaglum P, Gronvold NT, Ekeberg O. The impact of job stress and working conditions on mental health problems among junior house officers. A nationwide Norwegian prospective cohort study. *Med Educ* 2000;34:374-84.
39 Depue RA, Monroe SM. Conceptualization and measurement of human disorder in life stress research: the problem of chronic disturbance. *Psychol Bull* 1986;99:36-51.
40 Pitt E, Rosenthal MM, Gay TL, Lewton E. Mental health services for residents: more important than ever. *Acad Med* 2004;79:840-4.
41 Silvester S, Allen H, Withey C, Morgan M, Holland WW. *The provision of medical services to sick doctors. A conspiracy of friendliness? A study by the department of public health medicine UMDS St Thomas's Campus*. London: Nuffield Provincial Hospital Trust, 1994.
42 Ellis JJ, Inbody DR. Psychotherapy with physicians' families: when attributes in medical practice become liabilities in family life. *Am J Psychother* 1988;42:380-8.
43 Garelick AI, Gross SR, Richardson I, von der Tann M, Bland J, Hale R. Which doctors and with what problems contact a specialist service for doctors? A cross sectional investigation. *BMC Med* 2007;5:26.
44 Tyssen R, Rovik JO, Vaglum P, Gronvold NT, Ekeberg O. Help-seeking for mental health problems among young physicians: is it the most ill that seeks help? A longitudinal and nationwide study. *Soc Psychiatry Psychiatr Epidemiol* 2004;39:989-93.
45 McCranie EW, Brandsma JM. Personality antecedents of burnout among middle-aged physicians. *Behav Med* 1988;14:30-6.
46 Firth-Cozens J. Emotional distress in junior house officers. *BMJ* 1987;295:533-6.
47 Tyssen R, Dolatowski FC, Rovik JO, Thorkildsen RF, Ekeberg O, Hem E, et al. Personality traits and types predict medical school stress: a six-year longitudinal and nationwide study. *Med Educ* 2007;41:781-7.
48 Gopal R, Glasheen JJ, Miyoshi TJ, Prochazka AV. Burnout and internal medicine resident work-hour restrictions. *Arch Intern Med* 2005;165:2595-600.
49 Barnett RC, Gareis KC, Brennan RT. Fit as a mediator of the relationship between work hours and burnout. *J Occup Health Psychol* 1999;4:307-17.
50 Barrack RL, Miller LS, Sotile WM, Sotile MO, Rubash HE. Effect of duty hour standards on burnout among orthopaedic surgery residents. *Clin Orthop* 2006;449:134-7.
51 Hargreave M, Petersson BH, Kastrup MC. Kønsforskelle i stress blant læger? [Gender differences in stress among physicians.] *Ugeskr Laeger* 2007;169:2418-22. (In Danish.)
52 Vaglum P, Falkum E. Self-criticism, dependency and depressive symptoms in a nationwide sample of Norwegian physicians. *J Affect Dis* 1999;52:153-9.

III

A three-year cohort study of the relationships between coping, job stress, and burnout after a counselling intervention for help-seeking physicians.

Karin E Isaksson Ro[1,2]*, Reidar Tyssen[2], Asle Hoffart[1],
Harold Sexton[1], Olaf G Aasland[3], Tore Gude[1,2]

[1]The Research Institute, Modum Bad, NO-3370 Vikersund, Norway

[2]Department of Behavioural Sciences in Medicine, Institute of Basic Medical

Sciences, Faculty of Medicine, University of Oslo, Boks 1111 Blindern, NO-0317

Oslo Norway

[3]The Research Institute of the Norwegian Medical Association, Postbox 1152

Sentrum, NO-0107 Oslo and The Institute of Health Management and Health

Economics, University of Oslo, Norway

*Corresponding author

e-mail addresses:

Karin E Isaksson Ro: k.e.i.ro@medisin.uio.no

Reidar Tyssen: reidar.tyssen@medisin.uio.no

Asle Hoffart: asle.hoffart@modum-bad.no

Harold Sexton: hal.sexton@gmail.com

Olaf G Aasland: olaf.aasland@legeforeningen.no

Tore Gude: tore.gude@medisin.uio.no

Abstract:

Objective: We lack prospective studies on the impact of change in coping strategies among distressed physicians. The present study aimed to investigate the interplay of personality, stress, ways of coping, and emotional exhaustion in a three-year follow-up after a counselling intervention for burnout.

Methods: 227 physicians who attended a counselling intervention for burnout at the Resource Centre Villa Sana, Norway in 2003-2005, were followed with self-report assessments at baseline, one-year, and three-year follow-up. Main outcome measures were burnout, job stress, coping strategies, and neuroticism. Changes in these measures were analyzed with repeated measures ANOVA. Temporal relationships between changes were examined using structural modelling with cross-lagged and synchronous models and with construction of a path model to describe the interplay.

Results: 184 physicians (81%, 83 men, 101 women) completed the three-year follow-up assessment. The significantly reduced levels of emotional exhaustion (one dimension of burnout), job stress, and emotion-focused coping strategies from baseline to one year after the intervention, were maintained at three-year follow-up.

Panel modelling indicated that changes in emotion-focused coping (z= 4.05, p<0.001), job stress (z=3.16, p=0.003), and active coping (z=-3.32, p=0.002) preceded changes in emotional exhaustion. The path model confirmed the indication of this interplay as reduction in job stress (standardized path coefficient (r) =.50) and reduction in emotion-focused coping (r=.42) preceded the reduction in emotional exhaustion.

Conclusion: Reduction in emotion-focused coping and job stress had direct effects on reduction in emotional exhaustion. These results indicate that coping strategies and job stress are important foci in intervention programs that aim to reduce or prevent burnout in help-seeking physicians.

BACKGROUND:

The prevalence and predictors for the development of burnout in the medical profession have been explored to some extent [1-4], but there are very few follow-up studies after interventions for burnout among physicians. In particular, we lack prospective studies on the role of coping strategies in this group.

Coping strategies have been defined as strategies used by a person to reduce the possible harm of an event that is considered potentially dangerous to the person's psychological well-being [5], and they are usually grouped into (1) active, problem-focused and (2) emotion-focused ways of coping. Wishful thinking, an emotion-focused way of coping, has been found to be associated with depression in medical students [6], and has predicted need of mental health treatment in young doctors [7]. In cross-sectional studies, emotion-focused coping has also been associated with job stress and burnout among physicians [8,9] and with post traumatic stress disorder among Israeli doctors [10]. The use of active coping strategies has been described to increase with stress from malpractice litigations [11] and with work-related stress due to racism [12]. Therapeutic interventions, with the potential to change unfavourable coping strategies, have been described in patient populations faced with chronic stress [13]. It is important to study whether interventions, such as counselling or psychotherapy, could influence changes in coping strategies also among distressed physicians and whether such changes are related to reduction in emotional exhaustion.

Reduction in emotional exhaustion, often described as the primary dimension of burnout [14,15], has been found six weeks after a stress management workshop for residents [16] and one year after a counselling intervention for Norwegian doctors [17]. Following a general work hour limitation for residents in the United States in 2003, several studies found reduced rates of emotional exhaustion six months to a year later [18-21], whereas no

significant reduction was found after two years [22]. In a follow-up after a preventive intervention for health care workers, including physicians, initial reduction of emotional exhaustion was found, but levels increased again through two years of follow-up in the group without further interventions [23]. These results emphasize the need for follow-up studies over more than one to two years, in order to study the long-term course of burnout after interventions.

Theoretically, work load precedes work stress, which then may entail burnout. This process is influenced by both individual (e.g. personality and ways of coping) and organizational factors (e.g. specialist status). Therefore one may expect that reduction in burnout will be preceded by a reduction in job stress [24]. In cross-sectional samples an association between job stress (and two of its sub-dimensions, time pressure and work-home interface stress) and emotional exhaustion have been found among physicians [2,4]. In longitudinal normative samples of doctors, however, only reciprocal and no clear one-way directional relationships between job stress and emotional exhaustion have been found [25,26]. Although one study has found an association between number of work hours (one component of work load) and burnout among physicians [22], other studies have failed to do so [4,27-29]. A reduction in number of work hours/week has, however, been shown to be associated with reduction in emotional exhaustion, not only among US residents, but also in a cohort of Norwegian doctors [17].Thus factors that have not been documented as predictors of burnout development may, nevertheless, be important in the remission of burnout. This emphasizes the importance of models that control for multiple variables.

The personality trait most consistently associated with emotional exhaustion is neuroticism [14]. In a cross-sectional study of physicians this trait had 31% shared variance with exhaustion [8]. Neuroticism has predicted emotional exhaustion in physicians in long-

term prospective studies [3,30]. The role of neuroticism is thus important to study in relation to interventions for burnout.

A counselling program, offered to doctors at a Resource Centre for Health Personnel, Villa Sana in Norway, emphasized two main intervention areas; (1) Mapping and discussing the doctors´ present life situation, with an emphasis on (reduction of) job stress - often job stress related to the work-home interface. (2) Identifying and challenging the coping strategies being used by the physicians [17].

Baseline data from this program indicated that the intervention programs reached doctors in need of help [31], and data from one-year follow-up indicated a substantial reduction of emotional exhaustion [17]. Data on coping strategies in this cohort have not been reported previously.

On this basis, we examined the following research questions at three year follow-up with data from the same cohort.

1. How will emotional exhaustion, job stress, coping strategies and neuroticism change from baseline to three-year follow-up?

2. Will changes in neuroticism, job stress and ways of coping influence change in emotional exhaustion from baseline to three-year follow-up?

3. Will ways of coping be affected by post-intervention therapy?

METHODS:

Study design: The consecutively participating physicians in a counselling intervention at The Resource Centre for Health Personnel in Norway from August 2003 through July 2005 were eligible for inclusion in the study. Participants signed an informed, written consent. Self-report instruments were completed before the intervention (baseline) and were mailed to participants approximately one and three years after the intervention (two reminders given). Three-year follow-up was completed 36.9 months (SD 1.9, range 34-44.5) after baseline.

Sample: The cohort comprised 227 physicians at baseline (94% of 242 eligible). Three-year follow-up was completed by 184/227(81%), 83 men and 101 women. Data from all three assessment points (baseline, one-year, and three-year follow-up) were registered by 169/227 (74%) (Figure 1). The included physicians were on average 46.9 years old at baseline. Several of the physicians who were training to become specialists at baseline, had completed their training at follow-up (Table 1). The point prevalence and the number of weeks during the past year of full-time sick leave were significantly lower than at baseline (as found at one year follow-up [17]). The point prevalence of part-time sick leave, full- and part-time disability/rehabilitation/retirement benefits did not differ significantly from baseline (2-7/184; 1.1%-3.8%).

The decreased number of work hours/week from baseline to one-year persisted at three-year follow-up (Table 1). Eighty-nine/184 (48.4%) reported attending psychotherapy during one-year follow-up. Base-line data for the whole cohort, including a comparison with Norwegian doctors in general, have been presented previously [31].

Attrition analysis: There were proportionally more women than men who completed the three-year follow-up (101/117, 86.3%, 95% CI 80.1- 92.5 vs. 83/110, 75.5%, 95% CI 67.5-83.5, Chi-square =4.4, p=0.04). Physicians not completing three-year follow-up (n=43), compared with those completing three-year follow-up (n=184), had significantly higher baseline levels of emotional exhaustion (3.33 SD 0.88 vs. 3.01 SD 0.94, t=2.05, p=0.04), job stress (2.65 SD 0.74 vs. 2.39 SD 0.72, t=2.14, p=0.03) and emotion-focused coping strategies (3.25 SD 0.63 vs. 2.90 SD 0.76 t=2.75, p=0.006). There were no significant differences in age, the two other burnout dimensions, or active coping strategies.

Intervention: The Resource Centre is available for all Norwegian physicians. It is funded by the Norwegian Medical Association and is located at a psychiatric facility, Modum Bad.

The interventions are based on an integrative approach incorporating psychodynamic, cognitive, educational, and motivational interviewing theories [17].

Physicians chose to participate in one of two different interventions. The first was a single day, six to seven hour counselling session for one physician with a psychiatrist or a specialist in occupational medicine (MD). A "non-treatment" setting without medical records and with absolute confidentiality was ensured. After being invited to describe his or her situation the physician was asked to map both work-related and private contextual factors contributing to stress. Coping strategies, often related to sources of identity, self-esteem, and self-reliance in the individual, were identified, acknowledged, and challenged. The physician's present needs in both a short and a longer perspective were identified, and it was usually recommended that the doctor actively should deal with these needs (for example by stress reduction or obtaining treatment, such as psychotherapy).

The second type of intervention was a five day, group based course for eight participants, boarding at the Centre, and led by one of the same counsellors in collaboration with an occupational therapist. Daily lectures, group discussions, and physical activity were offered as well as an individual counselling session during the week. The intervention is described in more detail elsewhere [17,31].

Variables:

Burnout: Maslach´s Burnout Inventory with three subscales was used [32]. In this paper emotional exhaustion (10 items, Cronbach´s α=.92) is presented. As in previous studies of Norwegian physicians, a five-point scale (1–does not fit, 5–fits very well), with reference to the last two weeks at work, was used [14,17].

Personality: Eysenck´s abbreviated personality questionnaire with six items for neuroticism explaining 82% variance of the original scale was used (α=.71) [33]. Items were scored

dichotomously (1-yes or 0-no), and a sum score from 1-6 was obtained, in which higher scores designate more neuroticism.

Perceived job stress: 17 items from a modified version of the Cooper Job Stress Questionnaire, used in the Norwegian student/doctor cohort, were selected by a Principal Component Analysis. In addition nine clinically prompted items from the questionnaire were included, as previously described [17]. Job stress with 26 items (α=.92), as reported in this paper, consists of three subscales; emotional stress (10 items, α=.85), social stress, including work-home interface stress and time stress (10 items, α=.83) and fear of litigation (6 items, α=.86). The correlations between the subscales ranged from .48 to .64. Scores were given on a five-point scale (1 = no stress, 5 = very much stress), with reference to the two last weeks at work.

Coping strategies: Eighteen of 42 items in Vitaliano and colleagues` Ways of Coping Checklist were selected by a Principal Component Analysis of data from the Norwegian student/doctor cohort [6,7]. Vitaliano defines two main dimensions of coping strategies; the more adaptive ways of coping and the potentially maladaptive ways of coping [6]. Among the adaptive strategies two subscales are "problem-focused coping" and "seeking social support." In this study they are described with four and five items respectively, together designated as "active coping strategies" (α =.81). Among the potentially maladaptive strategies two subscales are "wishful thinking" and "blaming self." In this study they are described with seven and two items respectively, together designated as "emotion-focused coping strategies" (α=.82). Scores were given on a five-point scale (1=does not fit at all and 5=fits completely).

Demographic data: Gender, age, marital status, having children under 16 years of age (dichotomous variable).

Specialist status: Categorized into internal medical specialties, surgical specialties, psychiatric specialties, general practice (in Norway general practice or family medicine is an

approved specialty), public health and laboratory medicine, non-specialist (usually in specialty training) [31].

Work hours: Sum of hours per week used in direct patient contact, meetings, paperwork, on the telephone etc, research, and "other work activities" [17].

Psychotherapy: Attending psychotherapy during the first year after baseline intervention (0-no and 1-yes).

Sick leave: Number of weeks on full time/part time sick leave/rehabilitation/disability during the preceding year and registration of point prevalence.

Statistics:

Continuous, repeated parameters were tested with time (baseline, one-year and three-year), and with interactions between time and psychotherapy, in repeated measures ANOVA (repeated contrast).

Wilcoxon´s rank test was used for continuous, non-parametric data, while repeated measures with dichotomous variables were tested with McNemar´s test. t-tests and Chi-square tests were used respectively for comparison between different groups.

Effect sizes using pooled SD were calculated according to the method of Cohen, defining values of <0.20 as indicating no effect, 0.20-0.49 indicating small and 0.50-0.79 indicating moderate effect [34].

The temporal relationships among the variables neuroticism, active and emotion-focused coping, job stress, and emotional exhaustion were examined using the structural modelling program EQS 6.1, beta version, in a series of cross-lagged and synchronous models. The sample size was adequate for maximum likelihood estimation of models with a small number of parameters to be estimated [35]. Cronbach´s α-values from 0.71 - 0.92 support the internal consistency of the variables. The lack of excessive kurtosis or skewness in the variables indicated an adequately normal distribution of the data.

Modelling procedure:

(i) Panel modelling:

Cross-lagged panel models were constructed to examine the temporal relationships between changes in the parameters referred to above. When there were no significant cross-lagged paths, or if the model's fit was inadequate, we constructed synchronous effect models. The variables were allowed to correlate at baseline. A critical ratio (parameter/standard error) of 1.96 or greater was used to determine whether or not a path was significant at the 0.05-level.

(ii) Path model construction:

A path model was constructed to describe the interplay between baseline levels and changes in all four parameters. The results indicate how change in one parameter may cause change in other parameters. Due to a restricted number of subjects (n=184), the hypothesized path model was built on the findings from the panel models. The Wald test was used to guide the removal of paths that were not significant in the model and the Lagrangian Multiplier test was used to guide the addition of significant paths until the final path model was obtained. Significant correlations among the baseline variables were retained.

The Maximum Likelihood (ML)-based Comparative Fit Index >=0.95 in combination with the Standardized Root Mean squared Residual (SRMR)<=0.08 (which is independent of sample size) were used to determine model fit [35]. Robust statistics were used in testing the path model.

Missing data: One or a few missing items in instruments measuring coping strategies and neuroticism were replaced by the mean score of completed items. The instruments measuring job stress and emotional exhaustion included items that were not relevant for all respondents due to differences in working conditions (not working directly with patients as in laboratory work, leadership, research). Mean score of relevant items for each individual was used.

Zero to four/184 (0-2.2 %) of the instruments on burnout, job stress, coping and neuroticism at baseline, and 0-18/184 (0-9.8%) at three year follow-up were insufficiently completed.

Ethics:

Participants signed an informed, written consent. The study has been approved by the Data Inspectorate through the Norwegian Social Science Data Services. The Regional Ethical Research Committee in the South of Norway did not find special consent necessary for this study.

RESULTS:

Changes from baseline to three year follow-up (repeated measures ANOVA). Figure 2 shows overall changes and changes from baseline to one year and from one to three years in levels of emotional exhaustion, job stress, coping and neuroticism. There was a significant decrease in levels from baseline to one year follow-up for emotional exhaustion, emotion-focused coping, and job stress, with medium effect sizes, but little change from one to three year follow-up. All three subscales of job stress had a pattern similar to the main dimension of job stress. Neuroticism, however, decreased near-significantly from baseline to one year and significantly from one to three year follow-up. There were no significant changes in levels of active coping strategies.

Panel modelling of the temporal relationships among stress, neuroticism, coping and emotional exhaustion. Cross-lagged panel models indicated that high job stress at baseline increased active coping from baseline to three year follow-up and that high active coping at baseline reduced changes in emotion-focused coping from baseline to three year follow-up. (Table 2).

Synchronous panel models showed several significant directional effects indicating that improvement in one parameter was influencing change in other parameters. Decrease in emotion-focused coping and in job stress as well as increase in active coping had unilateral, significant and direct effects on decrease in emotional exhaustion. (Table 2)

Decrease in emotional exhaustion and in job stress had unilateral, significant, direct effects on decrease in neuroticism. (Table 2)

Constructing a path model for relationships among stress, coping and emotional exhaustion. Based on the significant, cross-lagged, and synchronous panel models we constructed a path model for describing the interrelationships among the parameters. The tentative path model based on the findings above resulted in non-significant relationships between emotion-focused coping and neuroticism. As neuroticism had no direct or indirect effect on emotional exhaustion and since we had a limited number of subjects, neuroticism was not included in the further modelling. As active coping at T3 did not influence emotional exhaustion directly or indirectly it was also excluded. The final path model was set up according to the remaining significant panel models. The Lagrangian Multiplier test suggested two additional paths, between emotion-focused coping at baseline and job stress at T3, as well as a negative relationship between emotional exhaustion at baseline and job stress at T3 for attaining the best fit. The final path model (Figure 2) thus indicates that reduction in job stress (standardized path coefficient r=0.67, Critical ratio CR =9.79, p<0.001) and reduction in emotion-focused coping (r=0.41, CR=8.06, p<0.001) led to a reduction in emotional exhaustion. Indirectly emotional exhaustion is influenced by active coping at baseline (via effect on emotion-focused coping) and by emotion-focused coping and burnout at baseline, via job stress (Figure 2). The standardized direct effect parameter coefficients on emotional exhaustion at three-year follow-up were .50 x job stress at three-year follow-up + .42 x emotion-focused coping at three-year follow-up + .12 x emotional exhaustion at baseline.

To test the stability of these relationships we constructed panel and path models also for values at one-year follow-up. The direct effects of changes in job stress and emotion-focused coping on changes in emotional exhaustion were similar to those for three-year follow-up in panel models and in the path model. [See Appendix]

Since job stress is a complex concept, separate analyses for the three job stress subscales were performed. Between baseline and three-year levels of these subscales we found that emotional distress did not have any significant cross-lagged or synchronous relationships to the other parameters, while changes in job stress due to social stress and due to fear of litigation had synchronous significant influences on changes in emotional exhaustion. Both reduction in social job stress and in fear of litigation influenced reduction in emotional exhaustion in the path models [See Appendix].

Role of psychotherapy: Doctors who received psychotherapy the first year after the intervention (n=89) reported higher baseline levels of emotional exhaustion (3.17 SD 0.89 vs. 2.85 SD 0.97, t=2.29, p=0.02) and neuroticism (2.91 SD 1.80 vs. 2.34 SD 1.78, t= 2.17, p=0.03) than the rest of the cohort (n=95). However, there were no significant differences in coping strategies or job stress at baseline. The two groups had a similar overall change in emotion-focused coping over the three-year period. There was, however, a significant interaction between time and change in emotion-focused coping $F(2,318)=4.54$, $p=0.01$. The repeated contrast indicated significant interactions both from baseline to one-year $F(1,159)=4.96$, $p=0.03$ and from one- to three-year follow-up $F(1,159)=8.90$, $p=0.003$. Repeated measures ANOVA was done for each group. The group in therapy had some reduction in emotion-focused coping during the first year of follow-up $F(1,87)=5.06$, $p=0.03$ and more from one to three years $F(1,87)=8.94$, $p=0.004$. The group without therapy had a reduction from baseline to one year $F(1,72) = 33.6$, $p<0.001$, but no further reduction from one to three years $F(1,72)=0.67$, ns. Levels at three-year follow-up were not significantly

different between the groups. There were no interactions between therapy and time for reduction in emotional exhaustion, job stress, active coping or neuroticism.

DISCUSSION

In this prospective, three-year follow-up study of physicians who had sought a counselling intervention we found that the significantly reduced level of emotional exhaustion, seen at one year follow-up compared with baseline, was maintained at three-year follow-up [17]. This contrasts with results from the few previous follow-up studies of preventive interventions for physicians that showed reduction in emotional exhaustion up to a year later [16,20,36] but indicated that levels tended to increase again without additional interventions [22,23]. In the present cohort there were no planned additional interventions. Some individuals have, however, on their own initiative, chosen to come to a second intervention at the Resource Centre (primarily within the first six months of follow-up), some have sought psychotherapy, and some have implemented a practical intervention by reducing weekly work hours, as reported previously [17]. All these post-intervention initiatives may have contributed to the reduction in emotional exhaustion over the years.

There was a reduction in emotion-focused coping strategies, with the reduction in emotion-focused coping leading to a reduction in emotional exhaustion. Although previous studies have found that physicians under stress report more use of active coping strategies than their colleagues [11,12], this study indicates that it was a reduction in emotion-focused coping strategies, rather than an increase in active coping, that influenced reduction in emotional exhaustion. Reduction of emotion-focused coping, such as self-blame or wishful thinking, may be a factor that can reduce the risk of relapse in emotional exhaustion with renewed stress-exposure. The associations between active and emotion-focused coping strategies and their influence on emotional exhaustion should be investigated further.

The rate of reduction in emotion-focused coping strategies was slower in the group of doctors who attended psychotherapy during the first post-intervention year than in the group who did not. The former group was initially more distressed, reporting higher baseline levels of emotional exhaustion and neuroticism than the rest of the cohort. Our results indicate that some physicians can change coping strategies after a short-term intervention (like the intervention at the Resource Centre, Villa Sana), while the most distressed physicians appear to perceive a need for additional psychotherapy that may have contributed to a reduction in emotion-focused coping. These findings could strengthen previous recommendations of counselling and psychotherapy as primary and secondary preventive interventions for doctors [37,38], as studies of other distressed groups also have found that therapeutic interventions can have the potential to change unfavourable coping strategies [13]. Since therapy in this study was self-selected, further studies are needed to confirm these findings.

Longitudinal studies have previously shown reciprocal relationships between changes in emotional exhaustion and changes in job stress in normative samples of physicians [25,26]. Here, however, a reduction in job stress unilaterally led to a reduction in emotional exhaustion. This could imply that the relationship between these parameters is different among physicians with high initial levels of emotional exhaustion, as in the present cohort, compared with physicians in normative samples.

As mentioned above, previous studies have shown a relationship between work-home interface stress and emotional exhaustion [2,4,26]. Consistent with this, we found that a change in social stress (including both work-home interface stress and time pressure) influenced change in emotional exhaustion, whereas change in emotional stress did not. We also found that reduction in stress due to fear of litigation had an influence on reduction in emotional exhaustion. Focusing on reduction in job stress, especially social job stress and fear of litigation, could thus be important in interventions for distressed physicians.

Neuroticism has previously been described as a relatively stable trait [30], whereas in this study it is near-significantly reduced from baseline to one year and significantly from one- to three-year follow-up. Neuroticism has previously been associated with and has predicted emotional exhaustion [3,8,30], whereas in this study changes in neuroticism (as estimated by the revised Eysenck´s Personality Questionnaire) were predicted by changes in job stress and emotional exhaustion. These relationships might differ between normative groups of physicians and a selected group, as in the present cohort. Further studies of the relationships between changes in emotional exhaustion, job stress and personality traits in initially distressed doctors are needed.

Strengths and limitations:

Strengths in this study are the prospective design and the high proportion of participants completing one- and three-year follow-up (81%), increasing the reliability of the results. The high response rate also strengthens the external validity of positive long-term outcome following a counselling intervention, like the one described, among physicians with burnout.

The one-group opportunistic design is a major limitation to interpreting the presented results as having a causal relation to the intervention. The main objective in this study was, however, to investigate the course and interplay of variables important for reduction of emotional exhaustion in a cohort of physicians after having participated in a counselling intervention.

The sample size is important in structural equation modelling techniques [35,39]. In order to limit the number of parameters in the model observed, rather than latent, variables were used. This was possible since the internal consistencies of the measures were acceptable. The constructed models fit the data quite well as indicated by the satisfactory model fit indices. In spite of restrictions due to the limited sample size, the main relationships between

16

emotional exhaustion, job stress and coping strategies were generally consistent at one- and three-year follow-up.

The study indicates that reduction in emotion-focused coping and job stress influenced reduction in emotional exhaustion. These findings do not necessarily reflect the only possible lagged relationships among these parameters. As stated above, the intervention focused on the use of coping strategies and reduction of stress, and the directions found might reflect this focus. Also, these directional changes are found in a group of physicians with initially elevated levels of emotional exhaustion who have decided to seek a counselling intervention and cannot be generalized to all physicians.

Participants lost to three-year follow-up were more often men and had higher levels of distress (emotional exhaustion and job stress), as well as higher levels of emotion-focused coping strategies at baseline. It is difficult to estimate how inclusion of these participants would have influenced results concerning change of these parameters from baseline to follow-up as well as regarding how measures influence each other during follow-up. Since the proportion lost to follow-up is relatively small (19%), the influence from this group on over-all results can be considered to be without major importance.

CONCLUSIONS:

Follow-up of physicians who participated in a counselling intervention showed that the significantly reduced levels of emotional exhaustion, job stress, and emotion-focused coping found at one-year, compared with baseline, were maintained at three-year follow-up. The results of structural modelling are compatible with the assumption that reduction in emotion-focused coping and in job stress influence reduction in emotional exhaustion. The clinical implication of these findings is that both change in coping strategies and reduction in

job stress are important foci for interventions with physicians aiming to reduce or prevent development of burnout.

Competing interests:

KR has been employed at the Resource center, Villa Sana, and is employed at the Research Institute, Modum Bad. She has once been reimbursed for a presentation of preliminary results from the study at an internal meeting of the Norwegian Medical Association .

RT and TG run part-time, semi-private specialist practices in psychiatry that also include some physician-patients who have participated in the Villa Sana programmes.

TG, AH and HS are employed at the Research Institute, Modum Bad.

OA is employed by the Norwegian Medical Association.

There are no other competing interests.

Authors´ contributions.

KR and TG conceptualized and designed the study, developed the construction of the questionnaire, analyzed and interpreted data and drafted the paper.

RT has contributed to drafting the paper.

AH and HS have contributed to analyzing and interpreting data.

OA has participated in the development and the construction of the questionnaire.

All authors have participated in revising the manuscript critically for important intellectual content and have approved the final manuscript.

References

1. Toyry S: *Burnout and self-reported health among Finnish physicians*. PhD thesis. Kuopio university publications d. Medical Sciences 365; 2005.

2. Linzer M, Visser MR, Oort FJ, Smets EM, McMurray JE, de Haes HC: **Predicting and preventing physician burnout: results from the United States and the Netherlands.** *Am J Med* 2001;111:170-5.

3. McCranie EW, Brandsma JM: **Personality antecedents of burnout among middle-aged physicians.** *Behav Med* 1988;14:30-6.

4. Visser MR, Smets EM, Oort FJ, de Haes HC: **Stress, satisfaction and burnout among Dutch medical specialists.** *CMAJ* 2003;168:271-5.

5. Folkman S, Lazarus RS: **An analysis of coping in a middle-aged community sample.** *J Health Soc Behav* 1980; 21:219-39.

6. Vitaliano PP, Russo J, Carr JE, Maiuro RD, Becker J: **The ways of coping checklist: revision and psychometric properties.** *Multivariate Behavioral Research* 1985;20:3-26.

7. Tyssen R, Vaglum P, Gronvold NT, Ekeberg O: **Factors in medical school that predict postgraduate mental health problems in need of treatment. A nationwide and longitudinal study.** *Medical Educ* 2001:35:110-20.

8. Deary IJ, Blenkin H, Agius RM, Endler NS, Zealley H, Wood R: **Models of job-related stress and personal achievement among consultant doctors.** *Br J Psychol* 1996;87:3-29.

9. Sharma A, Sharp DM, Walker LG, Monson JR: **Stress and burnout among colorectal surgeons and colorectal nurse specialists working in the National Health Service.** *Colorectal Disease* 2008;10:397-406.

10. Weiniger CF, Shalev AY, Ofek H, Freedman S, Weissman C, Einav S: **Posttraumatic stress disorder among hospital surgical physicians exposed to victims of terror: a prospective, controlled questionnaire survey.** *J Clin Psychiatry* 2006;67:890-6.

11. Martin CA, Wilson JF, Fiebelman ND III; Gurley DN, Miller TW: **Physicians' psychologic reactions to malpractice litigation.** *South Med J* 1991;84:1300-4.

12. Post DM, Weddington WH: **Stress and coping of the African-American physician.** *J Natl Med Assoc* 2000;92:70-5.

13. Folkman S, Greer S: **Promoting psychological well-being in the face of serious illness: when theory, research and practice inform each other.** *Psychooncology* 2000;9:11-19.

14. Schaufeli WB, Enzmann D: *The Burnout Companion to study and practice***.** London: Taylor and Francis Ltd 1998

15. Falkum E: **Hva er utbrenthet? [What is burnout?]**. [Norwegian]. *Tidsskr Nor Laegefor* 2000:120:1122-8.

16. McCue JD, Sachs CL: **A stress management workshop improves residents' coping skills.** *Arch Intern Med* 1991; 151(11):2273-7.

17. Isaksson Rø KE, Gude T, Tyssen R, Aasland OG. **Counselling for burnout in Norwegian doctors; one-year cohort study.** *BMJ* 2008; 337(a2004).

18. Goitein L, Shanafelt TD, Wipf JE, Slatore CG, Back AL: **The effects of work-hour limitations on resident well-being, patient care, and education in an internal medicine residency program.** *Arch Intern Med* 2005; 165:2601-6.

19. Hutter MM, Kellogg KC, Ferguson CM, Abbott WM, Warshaw AL: **The impact of the 80-hour resident workweek on surgical residents and attending surgeons.** *Ann Surg* 871;243:864-71.

20. Gopal R, Glasheen JJ, Miyoshi TJ, Prochazka AV: **Burnout and internal medicine resident work-hour restrictions.** *Arch Intern Med* 2005; 165:2595-600.

21. Martini S, Arfken CL, Balon R: **Comparison of burnout among medical residents before and after the implementation of work hours limits.** *Academic Psychiatry* 2006;30:352-5.

22. Barrack RL, Miller LS, Sotile WM, Sotile MO, Rubash H: **Effect of duty hour standards on burnout among orthopaedic surgery residents.** *Clin Orthop* 2006;449:134-7.

23. Rowe MM: **Teaching health-care providers coping: results of a two-year study.** *Journal of Behavioural Medicine* 1999:22:511-27.

24. Buddeberg-Fischer B, Klaghofer R, Stamm M, Siegrist J, Buddeberg C: **Work stress and reduced health in young physicians: prospective evidence from Swiss residents.** *Int Arch Occup Environ Health* 2008;82:31-8.

25. McManus IC, Winder BC, Gordon D: **The causal links between stress and burnout in a longitudinal study of UK doctors.** *Lancet* 2002;359:2089-90.

26. Innstrand ST, Langballe EM, Espnes GA, Falkum E, Aasland OG: **Positive and negative work-family interaction and burnout: A longitudinal study of reciprocal relations.** *Work and Stress* 2008;22:1-15.

27. Tyssen R, Vaglum P, Gronvold NT, et al. **The impact of job stress and working conditions on mental health problems among junior house officers. A nationwide Norwegian prospective cohort study.** *Medical Educ* 2000:34:374-84.

28. Tyssen R, Vaglum P, Gronvold NT, Ekeberg O: **The relative importance of individual and organizational factors for the prevention of job stress during internship: a nationwide and prospective study.** *Med Teach* 2005;27:726-31.

29. Tyssen R: **Health problems and the use of health services among physicians: a review article with particular emphasis on Norwegian studies.** *Ind Health* 2007;45:599-610.

30. McManus IC, Keeling A, Paice E: **Stress, burnout and doctors' attitudes to work are determined by personality and learning style: a twelve year longitudinal study of UK medical graduates.** *BMC Medicine* 2004;2:29.

31. Ro KE, Gude T, Aasland OG: **Does a self-referral counselling program reach doctors in need of help? A comparison with the general Norwegian doctor workforce.** *BMC Public Health* 2007;7:36.

32. Maslach C, Jackson SE: **The measurement of experienced burnout.** *Journal of Occupational Behavior* 1981;2:99-113.

33. Francis LJ, Brown LB, Philipchalk R: **The development of an abbreviated form of the Revised Eysenck Personality Questionnaire (EPQR-A): its use among students in England, Canada, the USA and Australia.** *Personality and Individual Differences* 1992;13:443-9.

34. Cohen J: *Statistical power analysis for the behavioral sciences.* Hillsdale NJ: Laurence Earlbaum Associates; 1988.

35. Hu L, Bentler PM: **Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives.** *Structural equation modelling* 1991;6:1-54.

36. Holt J, Del Mar C: **Reducing occupational psychological distress: a randomized controlled trial of a mailed intervention.** *Health Educ Res* 2006;21:501-7.

37. Firth-Cozens J: **Doctors, their wellbeing, and their stress.** *BMJ* 2003:326:670-1.

38. Firth-Cozens J: **The psychological problems of doctors.** In: *Stress in health professionals: psychological and organisational causes and interventions.* Edited by Firth-Cozens J and Payne RL. Chichester: John Wiley and sons Ltd 1999:79-92.

39. Eliason SR: *Maximal likelihood estimation. Logic and practice*. London: Sage Publications Ltd 1993.

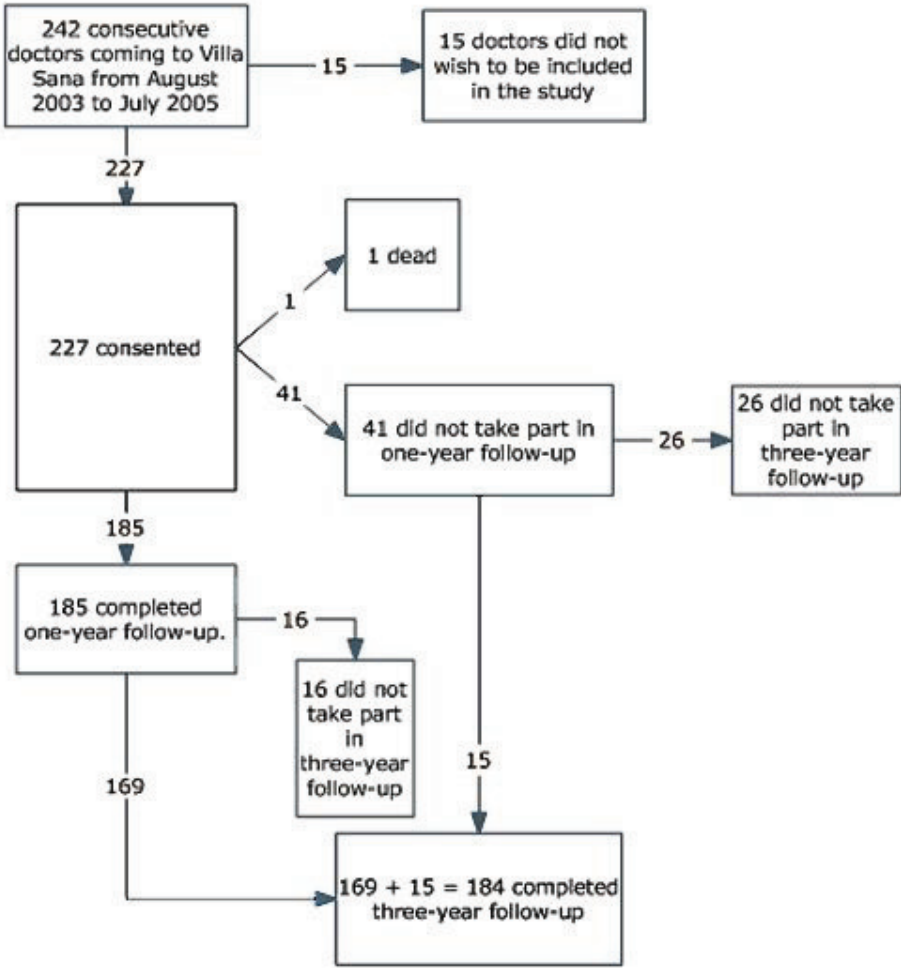**Figure 1. Flow chart over participation in the study.**

Figure 2. Levels of emotional exhaustion, job stress, coping and neuroticism.
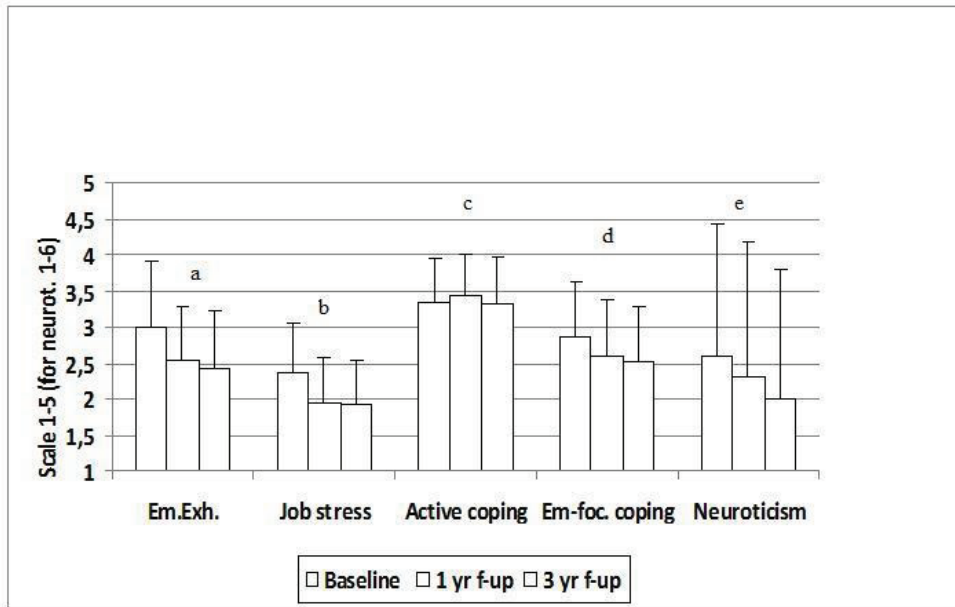
Repeated measures ANOVA for time (baseline, 1 yr, 3 yr) with contrasts for baseline-1 yr and 1 yr to 3 yr.

a. Overall ANOVA $F(1.8, 267.0^{\dagger})$ =33.1, p<0.001***. Baseline-1 yr $F(1,146)$=39.3 p<0.001***. 1 yr-3 yr $F(1,146)$=3.0, p=0.09. Effect size: Baseline-3 yr = 0.65

b. Overall ANOVA $F(2,314)$ =43.4, p<0.001***. Baseline-1 yr $F(1,157)$= 66.6, p<0.001***. 1 yr-3 yr $F(1,157)$= 0.4, p=0.51. Effect size: Baseline-3 yr = 0.70

c. Overall ANOVA $F(2,322)$ =2.5, p=0.09

d. Overall ANOVA $F(2,320)$ =24.5, p<0.001***. Baseline-1 yr $F(1,160)$=27.4, p<0.001***. 1 yr-3 yr $F(1,160)$=1.9, p=0.17. Effect size: Baseline-3 yr = 0.47

e. Overall ANOVA $F(2,322)$ =10.1, p<0.001 ***. Baseline-1 yr $F(1,161)$=3.6, p=0.06. 1 yr-3 yr $F(1,161)$=6.7. p=0.01**. Effect size: Baseline-3 yr = 0.34

*p< 0.05, **p<0.01, ***p<0.001

† - degrees of freedom corrected with Greenhouse-Geisser estimates, since Mauchly`s test showed a violation of the assumption of sphericity.

Figure 3. Final path with standardized path coefficients.
      n=163
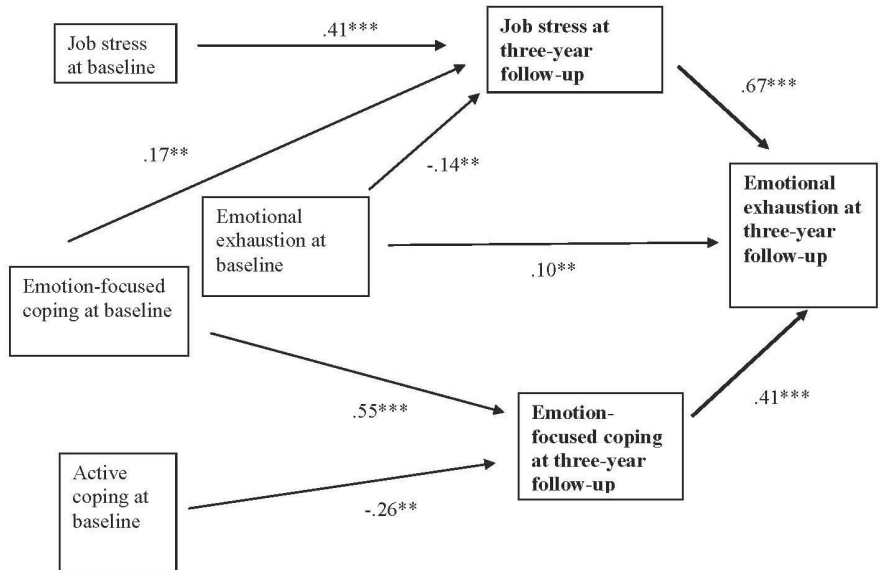
Note: χ² = 25.9, df=7, p<0.001, CFI=0.96 SRMR=0.06
*p<0.05 **p<0.01 ***p<0.001
Not shown, for reasons of clarity, are the significant correlations among the four baseline
measures, job stress, active coping, emotion-focused coping and emotional exhaustion.

Table 1. Description of physicians at baseline and at three-year follow-up after a counselling intervention.

		Baseline	Three-year Follow up	Level of significance
		Mean (SD) or Number (%, 95% CI)	Mean (SD) or Number (%, 95% CI)	McNemar´s test – p-value
Age (years at baseline) n=184		46.8 (8.9)		
Gender: Men/women n=184		83 (45%)/101 (55%)		
Married/cohabiting n=184		152 (82.6, 77.1-88.1)	135 (73.4, 67.0-79.8)	p=0.007**
Have children aged <16 years		90/184 (48.9, 41.7-56.1)	74/171 (40.2, 32.9-47.5)	p=0.02*
Specialty in: (n=184)	Internal medicine	27 (14.7, 9.6 – 19.8)	34 (18.5, 12.9-24.1)	p=0.02*
	Surgery	30 (16.3, 11.0-21.6)	34 (18.5, 12.9-24.5)	p=0.22
	Psychiatry	16 (8.7, 4.6 – 12.8)	17 (9.2, 5.0 – 13.4)	p=1.00
	General practice	45 (24.5, 18.3 – 30.7)	50 (27.2, 20.8 – 33.6)	p=0.18
	Social and laboratory med.	16 (8.7, 4.6 – 12.8)	19 (10.3, 5.9 – 14.7)	p=0.25
	Non-specialist	50 (27.2, 20.8 – 33.6)	18 (9.8, 5.5 – 14.1)	p<0.001***
	Missing		12 (6.5, 2.9 – 10.1)	
Proportion on full time sick leave at present (n=184)		60 (32.6%, 25.8 – 39.4))	10 (5.4%, 2.1 – 8.7)	p<0.001***
				Wilcoxon rank test
Number of weeks on full time sick leave/ disability/ rehab benefits during the preceding year		4.4 (7.9) (n=172)	3.2 (9.8) (n=178)	z=-3.1, p=0.002**
Work hours per week (h)		43.2 (8.5) (n=176)	39.6 (11.2) (n=166)	z=-3.7, p<0.001***

*p< 0.05, **p<0.01, ***p<0.001

Table 2: Panel models with good fit from baseline to three-year follow-up.

Cross-lagged significant paths[†]	Chi-square (df=1)	Confirmatory Fit Index (CFI)	Parameter/SE	CR‡, p-value
$JS_0 \longrightarrow AC_3$	4.53	0.95	0.14/0.06	2.26, p=0.03*
$AC_0 \longrightarrow JS_3$ (n=173)			0.04/0.07	-0.50, p=0.35
$AC_0 \longrightarrow EC_3$	6.24	0.96	0.20/0.08	-2.68, p=0.01*
$EC_0 \longrightarrow AC_3$ (n=183)			0.01/0.06	0.23, p=0.39
Synchronous Paths[†]				
$N_3 \longrightarrow EE_3$	0.98	1.00	0.09/0.07	1.38, p=0.15
$EE_3 \longrightarrow N_3$ (n=164)			0.70/0.23	3.11, p=0.003**
$AC_3 \longrightarrow EE_3$	0.50	1.00	-0.57/0.17	-3.32, p=0.002**
$EE_3 \longrightarrow AC_3$ (n=164)			0.24/0.13	1.84, p=0.07
$EC_3 \longrightarrow EE_3$	1.19	0.99	0.48/0.12	4.05, p<0.001***
$EE_3 \longrightarrow EC_3$ (n=164)			0.14/0.12	1.18, p=0.20
$JS_3 \longrightarrow EE_3$	6.63	0.98	0.72/0.23	3.16, p=0.003**
$EE_3 \longrightarrow JS_3$ (n=163)			0.12/0.15	0.78, p=0.29
$N_3 \longrightarrow JS_3$	0.05	1.00	-0.01/.04	-0.20, p=0.39
$JS_3 \longrightarrow N_3$ (n=172)			0.81/0.30	2.65, p=0.01*
$JS_3 \longrightarrow EC_3$	0.01	1.00	0.19/0.14	1.38, p=0.15
$EC_3 \longrightarrow JS_3$ (n=172)			0.13/0.10	1.34, p=0.16
$N_3 \longrightarrow AC_3$	0.35	1.00	0.02/0.04	0.53, p=0.35
$AC_3 \longrightarrow N_3$ (n=182)			-0.36/0.26	-1.39, p=0.15
$N_3 \longrightarrow EC_3$	0.40	1.00	0.14/0.04	3.79, p<0.001***
$EC_3 \longrightarrow N_3$ (n=181)			0.55/0.23	2.40, p=0.02*

Neuroticism (N), Active Coping (AC), Emotion-focused Coping (EC), Job Stress (JS), Emotional Exhaustion (EE). $_0$ - at baseline, $_3$-at three-year follow-up.
*p<0.05 **p<0.01 ***p<0.001. [†]Confirmatory fit index>=0.95 and Standardized root mean residual <0.08. ‡Critical ratio=parameter/standard error (distributed as z)

APPENDIX

Table A: Panel models with good fit from baseline to one-year follow-up.

| Cross-lagged, significant paths[†]	Chi-square (df=1)	Confirmatory Fit Index CFI[a]	Parameter/SE	CR‡, p-value
$AC_0 \longrightarrow EC_1$	6.34	0.96	-0.09/0.08	-1.10, p=0.22
$EC_0 \longrightarrow AC_1$ (n=176)			0.12/0.05	2.26, p=0.03*
Synchronous Paths[†]				
$N_1 \longrightarrow EE_1$	4.22	0.99	0.07/0.06	1.14, p=0.21
$EE_1 \longrightarrow N_1$ (n=164)			0.92/0.26	3.57, p<0.001***
$EC_1 \longrightarrow EE_1$	1.10	1.00	0.33/0.10	3.21, p=0.002**
$EE_1 \longrightarrow EC_1$ (n=163)			0.21/0.11	1.89, p=0.07
$JS_1 \longrightarrow EE_1$	3.67	0.99	0.44/0.19	2.26, p=0.03*
$EE_1 \longrightarrow JS_1$ (n=167)			0.24/0.12	1.92, p=0.06
$N_1 \longrightarrow JS_1$	1.88	0.99	-0.00/.04	-0.00, p=0.40
$JS_1 \longrightarrow N_1$ (n=173)			0.83/0.31	2.67, p=0.01*
$JS_1 \longrightarrow EC_1$	2.54	0.99	0.11/0.13	0.83, p=0.28
$EC_1 \longrightarrow JS_1$ (n=172)			0.19/0.08	2.37. p=0.02*
$N_1 \longrightarrow AC_1$	2.14	0.99	-0.01/0.03	-0.28, p=0.38
$AC_1 \longrightarrow N_1$ (n=177)			-0.20/0.32	-0.62, p=0.33
$N_1 \longrightarrow EC_1$	0.35	1.00	0.11/0.04	3.54, p<0.001***
$EC_1 \longrightarrow N_1$ (n=176)			0.68/0.25	2.69, p=0.01*

Neuroticism (N), Active Coping (AC), Emotion-focused Coping (EC), Job Stress (JS) and Emotional Exhaustion (EE)

$_0$- at baseline, $_1$-at one-year follow-up, *p<0.05 **p<0.01 ***p<0.001

[†]Confirmatory fit index>=0.95 and Standardized root mean residual <0.08

‡Critical ratio=parameter/standard error (distributed as z)

Figure (i). Final path with standardized path coefficients for baseline to one-year. n=163
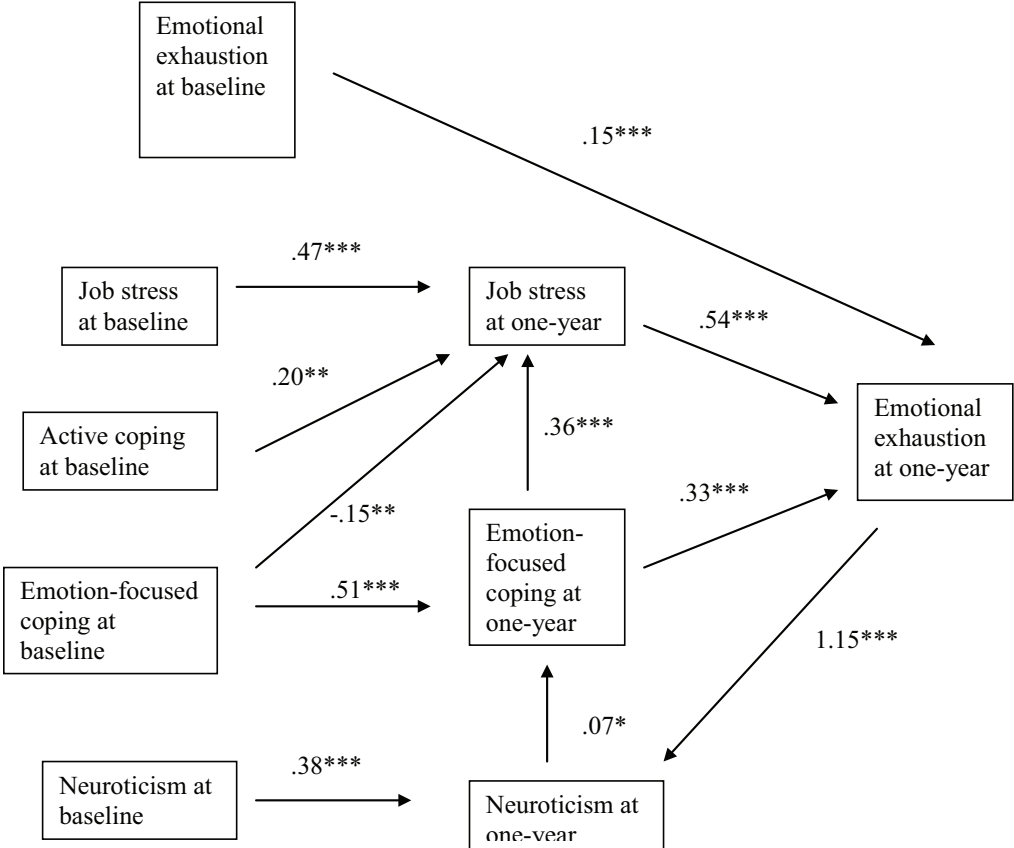
Note: χ^2 = 60.03, df=23, p<0.001, CFI=0.95 SRMR=0.05
*p<0.05 **p<0.01 ***p<0.001
Not shown, for reasons of clarity, are the significant correlations among the baseline measures, job stress, neuroticism, active and emotion-focused coping and emotional exhaustion

Table B: Panel models with good fit for sub-dimensions of job stress from baseline to three-year follow-up.

Synchronous Paths[†]	Chi-square (df=1)	Confirmatory Fit Index CFI[a]	Parameter/SE	CR[‡]
$JEm_3 \longrightarrow EE_3$	0.85	1.00	0.35/0.23	1.51, p=0.13
$EE_3 \longrightarrow JEm_3$ (n=160)			0.13/0.12	1.05, p=0.23
$JEm_3 \longrightarrow N_3$	0.16	1.00	0.62/0.32	1.95, p=0.06
$N_3 \longrightarrow JEm_3$ (n=167)			-0.04/.04	-0.92, p=0.26
$JEm_3 \longrightarrow AC_3$	3.03	0.97	0.09/0.14	0.66, p=0.32
$AC_3 \longrightarrow JEm_3$ (n=167)			-0.12/0.12	-1.03, p=0.23
$JEm_3 \longrightarrow EC_3$	0.002	1.00	0.03/0.14	0.24, p=0.39
$EC_3 \longrightarrow JEm_3$ (n=166)			0.11/0.09	1.25, p=0.18
$JSo_3 \longrightarrow EE_3$	20.08	0.93	0.57/0.15	3.74, p<0.001***
$EE_3 \longrightarrow JSo_3$ (n=163)			0.16/0.20	0.78, p=0.29
$JSo_3 \longrightarrow N_3$	0.23	1.00	0.61/0.22	2.77, p=0.009**
$N_3 \longrightarrow JSo_3$ (n=171)			-0.01/0.05	-0.16, p=0.39
$JSo_3 \longrightarrow AC_3$	4.29	0.96	0.11/0.10	1.08, p=0.22
$AC_3 \longrightarrow JSo_3$ (n=171)			-0.34/0.15	2.30, p=0.03*
$JSo_3 \longrightarrow EC_3$	0.004	0.99	0.13/0.10	1.39, p=0.15
$EC_3 \longrightarrow JSo_3$ (n=170)			0.16/0.11	1.44, p=0.14
$JFl_3 \longrightarrow EE_3$	0.14	1.00	0.49/0.19	2.62, p=0.01*
$EE_3 \longrightarrow JFl_3$ (n=163)			0.05/0.12	0.43, p=0.36
$JFl_3 \longrightarrow N_3$	0.04	1.00	0.52/0.30	1.75, p=0.09
$N_3 \longrightarrow JFl_3$ (n=171)			0.02/0.04	0.60, p=0.33
$JFl_3 \longrightarrow AC_3$	0.69	1.00	0.15/0.14	1.09, p=0.22
$AC_3 \longrightarrow JFl_3$ (n=172)			-0.23/0.14	-1.67, p=0.10

|				
JFl$_3$ → EC$_3$	0.24	1.00	0.22/0.13	1.70, p=0.09
EC$_3$ → JFl$_3$ (n=171)			0.10/0.11	0.98, p=0.25

Job stress due to Emotional stress (JEm), Social Job stress (JSo) and Job stress due to Fear of litigation (JFl) with Emotional Exhaustion (EE), Neuroticism (N), Active Coping (AC) and Emotion-focused Coping (EC). Note! Cross-lagged panel models either not significant or without good fit.

$_0$- at baseline, $_1$-at one-year follow-up, *p<0.05 **p<0.01 ***p<0.001

[†]Confirmatory fit index>=0.95 and Standardized root mean residual <0.08

[‡]Critical ratio=parameter/standard error (distributed as z)

Figure (ii). Final path with standardized path coefficients from baseline to three-year with stress sub-dimension Social job stress. n=163
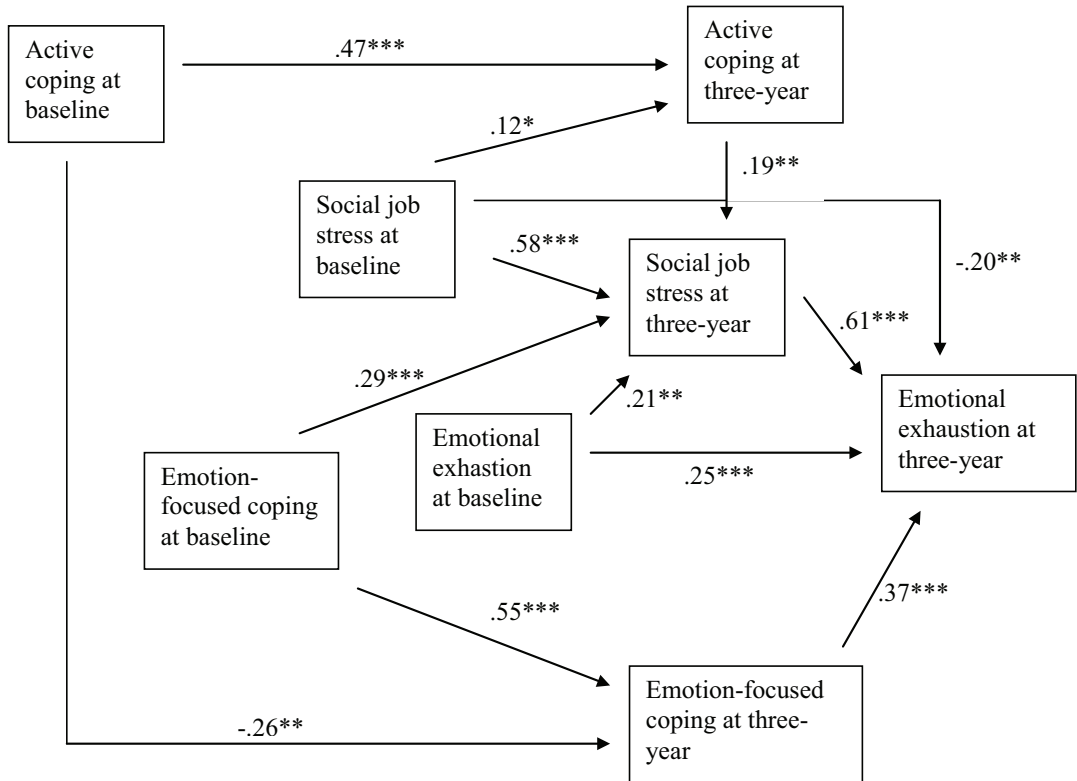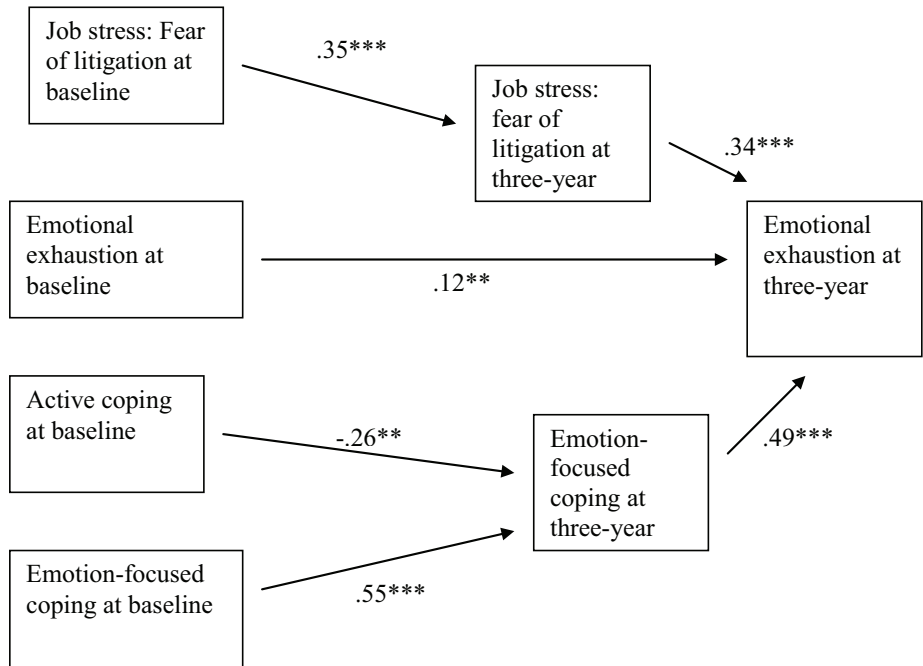

Note: χ^2 = 31.02, df=11, p=0.001, CFI=0.96 SRMR=0.08
*p<0.05 **p<0.01 ***p<0.001
Not shown, for reasons of clarity, are the significant correlations among the baseline measures, social job stress, active and emotion-focused coping and emotional exhaustion

Figure (iii). Final path with standardized path coefficients from baseline to three-year with stress sub-dimension Fear of litigation. n=163

Note: χ^2 = 24.08, df=9, p=0.004, CFI=0.95 SRMR=0.07
*p<0.05 **p<0.01 ***p<0.001
Not shown, for reasons of clarity, are the significant correlations among the baseline measures, job stress: fear of litigation, active and emotion-focused coping and emotional exhaustion