A study stress and burnout in nursing students in Hong Kong

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ABSTRACT

Background: Stress in nursing students may be related to attrition from nursing programmes and lead to a shortage of nurses entering clinical careers. In addition, stress leads to psychological morbidity which may have profound adverse consequences for individual nursing students.

Objectives: To follow a cohort of nursing students from entry to their programme to the end of the first year and to study the interrelationship between a range of psychological variables including personality, stress, coping and burnout.

Design: Prospective, repeated measures survey using self-administered questionnaires.

Setting: A university school of nursing in Hong Kong.

Participants: Students were selected on the basis of entry to their nursing programme in 2004; 158 students entered the study and 147 completed; 37 were male and 121 were female at entry. The mean age of the cohort at entry was 19.1 (SD 0.85); ages ranged from 18-26.

Methods: The questionnaires administered at wave 1 were: the NEO Five Factor Inventory, the Coping in Stressful Situations questionnaire, the 12 item General Health Questionnaire, the Maslach Burnout Inventory and the Stress in Nursing Students questionnaire. At wave 2 the 12 item General Health Questionnaire, the Maslach Burnout Inventory and the Stress in Nursing Students questionnaire were administered .

Results: Students suffered greater levels of psychological morbidity and burnout at the second time wave and this was largely explained by the personality trait of Neuroticism. Stress also increased and this was largely explained by Emotion oriented coping.

Conclusions: Undertaking a nursing programme leads to increased level of stress, burnout and psychological morbidity and this is largely related to individual personality and coping traits.

Key words: burnout, coping, general health, nurses, stress, students

What is already known about the topic:

- Nursing students suffer from stress and psychological morbidity
- Stress and psychological morbidity have adverse effects such as burnout and attrition

What this paper adds:

- Psychological morbidity in nursing students in Hong Kong is largely explained by individual personality traits
- Stress in nursing students in Hong Kong is largely explained by individual coping strategies

INTRODUCTION

There is now a global shortage of nurses (Buchan & Calman 2004) and a major contributory factor to this is the high attrition rates of nurses and nursing students, which are linked to stress and burnout. Recent and extensive coverage has been given to stress in nurses (Chang et al., 2005) and an increasing amount of research has focused on stress in nursing students (Jones & Johnson, 1997, 1999, 2000).

Stress

Stress is intrinsic to nursing and a highly demanding job with poor support, rapidly changing circumstances, shortage of resources and staff, and dealing with death and dying all contribute (Chang et al., 2005). Nursing is emotionally demanding and this interactive stress contributes to the daily stress of nurses (Mann & Cowburn, 2005). Environmental factors compound these intrinsic factors and these include difficult patients and their families, relationships with physicians and low institutional commitment to nursing (Chang et al., 2005). In addition to the daily stresses of nursing, nurses are required to undertake continuing professional development (Hogston, 1995) and part-time education (Timmins & Nicholl, 2005). High levels of stress seem to afflict newly qualified nurses and this is associated with entering the clinical setting for the first time whereby they seem to experience lack of confidence through exposure to unfamiliar circumstances (Chang et al., 2005; Chang & Hancock, 2003).

Outcomes of stress

Stress leads people to cope poorly with situations, such as using more emotion focused coping (Deary et al., 1996). Despite stress leading nurses to seek social support (LeSergent & Hanley 2005), a recent study by Wu et al. (2007) demonstrated that burnout amongst nursing staff was related, amongst other things, to increased level of occupational stress. Although stress is normal in a range of circumstances (Smith & Fawcett 2006) the negative consequences arising from workload factors associated with stress, such as increasing patient load, can lead to emotional exhaustion, or burnout (Maslach & Jackson 1986), a concept that will be described below.

Nursing students

In addition to the above, nursing students not only experience such stress in clinical practice but also from sources such as separation from home, financial worries, regular clinical and educational assessment and frequently changing clinical environments (Deary et al., 2003). Deary et al. (2003) showed that nursing students experience increasing levels of stress and psychological morbidity throughout their nursing programme and that the personality trait of neuroticism was initially associated with the emotional exhaustion aspect of burnout and that conscientiousness was associated with a greater sense of achievement from work. This relationship between personality factors and burnout has previously been demonstrated in nurses by Zellars et al. (2000).

Stress in nursing students does not just have negative effects on them; ultimately it will have a negative effect on the nursing workforce. These deleterious effects of stress on the workforce include leaving it periodically or permanently through stress related illness

(Ryan et al., 2005). The remaining workforce has to compensate for stress related absence and increasing their workload further increases their stress and leads to poor patient care

Attrition

Attrition is also a recognised problem among nursing students (Deary et al., 2003) which increases the costs of those who fund nurse education. For example, in response to increased government targets in the UK for recruiting nursing students, admission to the nursing register increased by nearly 8000 between 1998 and 2005 (Nursing & Midwifery Council, 2005), representing a 65% increase in nurses entering the register in England alone. However, the average level of attrition in UK universities providing nursing education is 13% representing an annual loss of over 2500 students. There is, therefore, a robust business case for studying factors related to attrition among nursing students. The UK national workforce projects/workforce review team (Buchan, 2005) reckoned that by 2014 the UK would need twice as many new entrants as it has now just to keep the workforce constant. Identifying the antecedent and consequent correlates of stress, which is a known factor in the attrition of nurses and student nurses (Jones & Johnson, 2000), may illuminate strategies for alleviating it. This could, possibly, lead to strategies for increasing retention of nursing students.

Hong Kong

In contrast to the UK, few data exist on issues such as stress and attrition in nurses and nursing students, which are important factors pertaining to workforce forecasting and

planning, in Hong Kong. Hong Kong, a special administrative region of the People's Republic of China, with a population of 6.8 million people, has around 35,000 practicing nurses (Chan et al., 2006). All nurses in Hong Kong are required to have a practice qualification at bachelor's degree level. Hong Kong started its first nursing degree programme in 1990 and now three of its eight universities offer four-year Bachelor of Nursing honours programmes, with a total intake of around 600 per annum (Thompson, 2006). Until recently, there has been no nursing shortage in Hong Kong; however, this is changing and in the very recent past nursing shortages are being reported (http://www.medill.northwestern.edu/medill/grad/special_programs/global/filed_from_residency/hong_kong_suffers_nursing_shortage_baptist_hospital_ceo_says.html; accessed 17 August 2007) and this is predicted to become much worse in the near future. Therefore, the case for studying factors that possibly relate to attrition in nursing students in Hong Kong is increasing and this, in part, justifies the study reported here.

Of additional, and specific, relevance to Hong Kong is the issue of suicide, in which there was a 50% increase between 1997 – 2003 (http://csrp.hku.hk/WEB/eng/statistics.asp accessed 1 December 2006). In fact, suicide is the leading cause of death in Hong Kong for those aged 15-24 (Yip et al., 2004), and the majority of the nursing students in this study were in that age group. Academic self-concept and parental dissatisfaction with academic performance have been significantly associated with suicidal ideation amongst Hong Kong adolescents (Lee et al., 2006). It is common, in Hong Kong, for parents to make significant financial sacrifice for their children's education, and stress in students could be partly due to Chinese cultural and Confucian concepts of collectivism versus

individualism, self-control, familial piety, good relationships with others and a sense of fulfilling obligations (Graham, 1991; Bond, 1992).

Theoretical perspectives on stress

Stress can be viewed as response-based, ie emanating from individuals' reactions to events and circumstances, stimulus-based, ie the result of events and circumstances, or as interactive and resulting from interplay between stimuli and responses (Furnham, 2005). The interactive or transactional model of stress proposed by Lazarus (1966) is entirely applicable to the circumstances of nursing students and is the framework adopted for the present study. Nursing students encounter an array of new and sometimes difficult circumstances when they enter their programme of education and this provides the stimulus for stress. These nursing students will all be individuals taking into their programmes a range of personality types and coping strategies providing responses to stressful situations; therefore, the interaction between their circumstances and their responses is of interest. In the case of nursing students, the kind of stress resulting from this transaction between stimuli and responses is classified as occupational or work-related stress (Jones & Johnson, 2000) and specific instruments, one of which will be described in the methods section below, have been developed to measure this kind of stress and some of these are specific to nursing students (Jones & Johnson, 1999; Deary et al., 2003).

Burnout

Stress is not an isolated outcome of the transaction between stimuli and responses and the concept of professional burnout is closely related to it (Schaufeli et al., 1993). Burnout, a phenomenon that is probably unique to people working in human caring services (Cox et al., 1993), leads to emotional exhaustion and a tendency to depersonalize those who are being cared for; it also reduces a sense of achievement. According to Cox et al. (1993) the transactional model of stress is closely related to burnout and maps on to several aspects of occupational stress. In the same way as response-based factors contribute to stress, individual characteristics also influence burnout, and the relationship between personality factors and burnout has also been studied (Cox et al., 1993).

The present study

The theoretical perspective of the present study is transactional and the aim was to study the relationship between personality, stress, burnout and psychological morbidity in nursing students in Hong Kong. Such a study has not previously been conducted in Hong Kong and it will serve to inform nursing educators in Hong Kong and it will also provide an international comparison with other, similar, studies. The research question guiding this study was: is there a relationship between individual traits and a range of psychological outcomes in nursing students?

METHODS

Design

The design of this study was prospective using repeated measures in a cohort sample and self-administered questionnaires for data collection. The data were collected in 2004 and 2005. Participants were nursing students in one university department of nursing in Hong Kong who entered their nursing programme in 2004. Data were collected in two waves: at the start of the programme (wave 1) and after seven months (wave 2), when the students were together for the last time prior to undertaking clinical practice. Access to the students was gained through the head of department and the proposal for the study was subject to ethical approval by the University's review procedure. The voluntary nature of participation in the study was explained to students in a letter of introduction to the study. Therefore, students could decide to participate or not and time was allocated twice (waves 1 & 2) within the curriculum for distribution of the questionnaires. There was no remuneration for participating. Questionnanires were taken home by the students, completed and returned the following day; it is estimated that completion of the questionnaires (185 items) took approximately one hour for wave 1 and 30 minutes for wave 2.

Sample

The sample consisted of all nursing students entering a programme of education towards general (adult) registration at one university department of nursing in Hong Kong. At the start of the study, 158 students participated of which 37 were male and 121 were female. No students decline to participate. The mean age of the cohort was 19.1 (SD 0.85); ages ranged from 18-26. Dropout from the programme of study was minimal between wave 1 and wave 2 and is not considered as a dependent variable in this study. The instruments

administered in this study were not used diagnostically with individual students. Therefore, students were not referred to support services as a result of outcomes measured in this study. However, all normal student support services were available to students throughout the study.

Self-administered instruments

Three widely used and commercially available, reliable and validated psychometric instruments – considered to be 'gold standards' in this field - were used to gather data in the present study to measure personality, psychological morbidity and burnout, respectively:

NEO Five Factor Inventory (NEOFFI) (Costa & McCrae, 1992)

This assesses five personality traits: Neuroticism (a greater tendency towards feelings of worry), Extraversion (a tendency towards sociability), Openness (being open to new experiences) and Agreeableness, (a tendency to be pleasant), and Conscientiousness (being careful and reliable). Each trait is assessed by 12 questions. The content validity of the NEOFFI has been extensively tested and the internal consistency, measured using Cronbach's alpha, of the five dimensions are: Neuroticism = 0.86; Extraversion = 0.77; Openness = 0.73; Agreeableness = 0.68; Conscientiousness = 0.81.

General Health Questionnnaire-12 (GHQ12) (Goldberg & Williams, 1988)

The total score of this 12 item instrument was used to measure psychological morbidity (minor, non-psychotic, psychiatric disorder). The scoring system used the 0-4 Likert

scoring system giving a possible range of GHQ12 scores from 0-36. The validity of the original GHQ30, from which the GHQ12 is derived, is well established and the internal consistency of the GHQ12, using Cronbach's alpha, is 0.85.

Maslach Burnout Inventory (MBI) (Maslach & Jackson, 1986)

This 22 item instrument measures the following aspects of professional burnout: Emotional exhaustion (feeling unable to carry on), Depersonalisation (treating people as objects) and Personal accomplishment (gaining satisfaction from the job). The validity of the MBI is well established (Cox et al., 1993) and the internal consistency of the dimensions of the MBI, using Cronbach's alpha, are: Emotional exhaustion = 0.09; Depersonalisation = 0.71; Personal accomplishment = 0.71.

In addition, the following two instruments were used:

The Coping Inventory for Stressful Situations (CISS) (Cosway et al., 2002)

This assesses the extent to which respondents use the following coping strategies: emotion oriented (becoming emotionally upset in the face of stress), task oriented (addressing the causes of stress) and avoidance oriented (doing something to avoid facing stress): divided into distraction oriented and social diversion oriented). The instrument has 48 items. The factorial validity of the CISS has been reported and the high internal consistency of the inventory (Cronbach's alpha > 0.8) in several professional groups indicates the reliability of the instrument.

Stress in Nursing Students (SINS) (Deary et al., 2003)

This 43 item instrument assesses stress related to the student nurse experience under the following dimensions: clinical work, confidence, education and finance. The SINS has a robust factor structure related to the above four dimensions. This instrument, which is content valid, has only been reported once previously and the internal consistency of the dimension of stress are reported in this paper under Results.

Procedure

Instruments were administered and data collected as follows:

- Wave 1: NEOFFI, CISS, GHQ12, MBI, SINS
- Wave 2: GHQ12, MBI, SINS

The number of questionnaires the students had to complete at any wave was minimized by avoiding repetition of the NEOFFI and CISS, and the above strategy also reflects that personality and coping strategies are more trait-like, and that individual differences were unlikely to change over the time of the study. To measure the impact of the programme on more state-like factors such as psychological morbidity, burnout and stress, these were measured at waves 1 and 2.

Analysis

Data were entered into an SPSS for Windows 14.0 database (http://www.spss.com/uk/; accessed 17 August 2007) for analysis including: t-testing, Pearson's correlation and partial correlation, stepwise multiple regression and Cronbach's alpha. The response rates

for each of the questionnaires was different as not all students at the second wave answered every question on every questionnaire, therefore, analysis was carried out using listwise deletion.

RESULTS

Participation and sample characteristics

At wave 1, 158 students participated as described earlier and 147 participated at wave 2 representing response rates of 100% and a maximum of 93% (not all questions were answered), respectively.

Relationship between personality and coping strategies

The principal associations between dimensions of the NEOFFI and CISS at wave 1 were as follows: positive correlations between Neuroticism and Emotion-oriented coping ($r = .59$; $p < 0.01$); Conscientiousness ($r=.37$; $p<.01$), Extraversion ($r=.31$; $p<.01$) and Openness($r=.25$; $p<.01$) and Task-oriented coping; and Extraversion and Social diversion-oriented coping ($r=.29$; $p<.01$). Because there were significant negative correlations between Neuroticism and Extraversion and Conscientiousness, the correlations were re-run, controlling for Neuroticism but the subsequent size and directions of the correlation between dimensions of the NEOFFI and CISS were very similar.

Relationship between personality and coping strategies with stress, burnout and psychological morbidity: contemporaneous

Correlations between dimensions of the NEOFFI and the CISS and SINS, MBI and GHQ12 are shown in Table 1. Higher Neuroticism is correlated with higher scores in all dimensions of SINS, with the Emotional exhaustion and Depersonalisation dimensions of the MBI, and with the GHQ12. Extraversion correlates negatively with SINS-E, MBI Emotional exhaustion and GHQ12. When Neuroticism is controlled for, the associations between Extraversion and Personal accomplishment and GHQ12 are much reduced and, in the case of GHQ12, non-significant. Conscientiousness shows a similar pattern of correlations to Neuroticism, though they are in the negative direction and often smaller, and it also correlates positively with the Personal accomplishment dimension of the MBI. When Neuroticism is controlled for, the associations between Conscientiousness and all SINS dimensions MBI-EE, MBI-DP and GHQ12 are much reduced and the majority non-significant. On the other hand, after controlling for Neuroticism, the correlation between Conscientiousness and MBI-PA increases. The Openness dimension of NEOFFI correlates negatively with the Depersonalisation and Personal accomplishment dimensions of the MBI and the correlations between the remaining dimensions of NEOFFI (ie controlling for Neuroticism) and GHQ12 are not significant, supporting the view that Neuroticism explains most of the variance in GHQ12.

Higher scores in the Emotion-oriented coping dimension of CISS are correlated with higher scores in all dimensions of SINS and MBI (except Personal accomplishment) and with the GHQ12. Task-oriented coping correlates significantly and positively with MBI Personal accomplishment.

SINS

The internal consistency using Cronbach's alpha of SINS, which has only been reported previously once (Deary et al., 2003), was examined in this study. The internal consistency of all dimensions was acceptable (Cronbach's alpha > 0.7), with even the lowest value, for the Financial dimension of SINS at wave 2, at an acceptable 0.67.

Stability of instruments used at both waves 1 and 2

The stability of GHQ12, SINS and MBI are shown in Table 2. All instruments show significant stability of individual differences based on the correlation of the measures across time. Absolute stability examined whether mean scores change across time. GHQ12 score increased. SINS Education and MBI Emotional Exhaustion and Depersonalisation increased between wave 1 and wave 2; SINS Clinical and MBI Personal accomplishment both decreased between wave 1 and wave 2.

Relationship between personality and coping styles with stress, burnout and psychological morbidity: across time

Correlations between dimensions of the NEOFFI and CISS at wave 1 with SINS, MBI and GHQ12 at wave 2 were studied. Higher Neuroticism at wave 1 is correlated significantly and positively with all SINS dimensions ($.29 \leq r \leq .47$; $p<.01$), MBI Emotional exhaustion ($r=.52$; $p<.01$) and Depersonalisation ($r=.19$; $p<.01$) and GHQ12 at wave 2 ($r=.47$; $p<.01$). There is a negative correlation between Neuroticism at wave 1 and MBI Personal accomplishment at wave 2 ($r=-.32$; $p<.01$). CISS Emotion-oriented

coping shows a very similar pattern and size of correlations to Neuroticism. The other notable across-wave associations are the positive associations between wave 1 Conscientiousness ($r=.23$; $p<.01$) and Task-oriented cooping ($r=.23$; $p<.01$) with wave 2 Personal accomplishment.

Relationship between stress and burnout

Correlations of the dimensions within the SINS and the dimensions within the MBI and between these two instruments' dimensions at wave 1 and wave 2 were studied as were correlations of the SINS and MBI with the GHQ. At both waves all dimensions of SINS correlate positively. The Personal accomplishment dimension of the MBI does not correlate significantly with the Emotional exhaustion and Depersonalisation dimensions but these both correlate strongly at wave 1 ($r=.65$; $p<.01$) and wave 2 ($r=.58$; $p<.01$). At wave 1 the Emotional Exhaustion dimension of the MBI has positive and mostly significant associations with all dimensions of the SINS ($.10\leq r \leq.31$), all of which are significant and larger in effect size at wave 2 ($.33\leq r \leq.50$). The Depersonalisation dimension of the MBI shows positive and mostly significant correlations with all dimensions of the SINS at wave 2 ($.16\leq r \leq.33$), though there are no significant associations at wave 1. MBI Personal accomplishment shows little association with SINS dimensions at either waves 1 or 2. Examining correlations across time waves does not add anything to the contemporaneous correlations.

Determinants, across time, of psychological morbidity and burnout

GHQ12, Emotional exhaustion, Depersonalisation and Personal accomplishment were entered as dependent variables into a series of stepwise multiple linear regression analyses using GHQ12 and all dimensions of NEOFFI, CISS, SINS and MBI at wave 1. The Clinical, Confidence, Educational and Financial dimensions of SINS at wave 2 were entered as dependent variables into a series of stepwise multiple linear regression analyses using all dimensions of NEOFFI and CISS at wave 1. Table 3 shows that Neuroticism is retained in the regression equation for wave 2 GHQ12, Emotional exhaustion and Personal accomplishment and, in each case, is the most important predictor variable. Neuroticism is positively associated with GHQ12 and Emotional exhaustion and negatively associated with Personal accomplishment. Emotion-oriented coping and Personal accomplishment (at wave 1) are also retained in the regression equations for Emotional exhaustion and Personal accomplishment, respectively, and are positively associated with both. For Depersonalisation, the most important independent variable is Emotion-oriented coping (positive association) which is retained in the regression equation with Agreeableness (negative association). The respective dimensions of SINS at wave 1 are retained in the regression equations for all dimensions of SINS at wave 2, and Emotion-oriented coping at wave 1 is retained for all dimensions of SINS at wave 2. All of these relationships are positive. Task-oriented coping is retained on the regression equation for stress related to Confidence and is negatively associated with it.

DISCUSSION

Broadly, in the cross-sectional data, there are two complexes of associations that encompass personality traits, coping strategies and stress and burnout. The first includes the personality trait of Neuroticism, Emotion-oriented coping, all self reported stress scales and the emotional exhaustion and depersonalization aspects of burnout. The second includes the personality trait of Conscientiousness, Task-oriented coping, and the personal accomplishment aspect of (non-)burnout. There are additional findings in the longitudinal data. These closely agree with the complexes of association among similar variables tested in consultant doctors (Deary et al., 1996) and nurses (Zellars et al., 2000). Stress, burnout and psychological morbidity increase over time in these nursing students. Higher trait Neuroticism and Emotion-oriented coping are strong, and correlated, predictors of psychological morbidity, Emotional exhaustion; lower Neuroticism predicts higher Personal accomplishment. Stress in nursing students is strongly predicted by Emotion-oriented coping.

This study was designed, prospectively, to investigate the determinants of, and relationships among, personality, stress, coping and burnout in nursing students in Hong Kong. The results show that some important relationships exist and that pre-existing dimensions of personality, coping strategies and psychological morbidity indeed determine subsequent psychological dimension when standard measurements are made at entry to the programme and later in the first year of study. In terms of the theoretical foundation for the study, the transactional model of stress and burnout is clearly supported (Lazarus, 1966). Specific aspects of this will be examined below.

Personality

The importance of the personality trait Neuroticism is demonstrated by its strong contemporaneous correlation with Emotion-oriented coping, Emotional exhaustion and psychological morbidity. Across time, in the present study, Neuroticism was correlated with all the dimensions of stress measured by SINS, with the negative aspects of burnout and with psychological morbidity. When the predictive ability of Neuroticism was modelled across time in the presence of other possible predictors it remained a strong predictor of psychological morbidity and Emotion-oriented coping. In addition, wave 1 Conscientiousness was strongly correlated with wave 1 Task-oriented coping and both of these were positively correlated with Personal accomplishment at wave 2. Modelling across time demonstrated that higher Personal accomplishment at wave 2 was predicted by lower Neuroticism. Higher Neuroticism remained the sole predictor of psychological morbidity across time. In terms of the existing literature, this builds upon and confirms the study of Deary et al. (2003), except that this is in a distinctly different population, and extends the work of Zellars et al. (2000) by adding repeated measures.

Coping strategies, stress and burnout

Dimensions of stress become more strongly correlated with Emotional exhaustion across time whereby three dimensions become correlated with Depersonalisation and this is in line with the study of Wu et al. (2007); however, the present study has the advantage of repeated measures. Higher Emotion-oriented coping at wave 1 is correlated with higher dimension of stress and negative aspects of burnout and the negative effect of Emotion-oriented coping is demonstrated by it predictive ability for all aspects of stress and the

negative dimensions of burnout. An association between coping strategies, measured using the CISS, and burnout with emotion-oriented coping leading to greater burnout, has previously been observed in nurses (Jaracz et al., 2005). Emotion-oriented coping is strongly associated with psychological morbidity at wave 1 but does not appear to have predictive value, possibly due to its strong association with Neuroticism. That Depersonalisation is predicted by lower Agreeableness and more Emotion-oriented coping makes sense as these people are more likely to treat patients as objects than as individuals.

Attrition

While some students were lost from the study, none were lost from the programme and this is a characteristic of nursing students in Hong Kong and, especially, at the institution where the study was conducted, though it is not specific to nursing or to this institution – the average attrition rate is around 5%. This raises a question about the relationship between stress and attrition from nursing programmes and, specifically, the relationship between stress and remaining on the programme in Hong Kong. It is very hard to know why nursing students leave nursing programmes and a previous study (Deary et al., 2003) was only able to demonstrate a weak predictive ability of personality for likelihood of leaving. However, while students who experience stress are often the most conscientious (Deary et al., 2003) and, as a result of this dimension of personality, likely to remain on a programme, it is logical to assume that stress will contribute, to some extent, to attrition; but this remains to be demonstrated (Jones & Johnson, 2000). However, where attrition is low as a result of anathematising leaving a programme, it could be argued that the

effects of stress could be severe and adverse in terms of achievement over a longer period. This study demonstrated increased levels of stress within the timeframe of the study. Nevertheless, it could be hypothesised that high mental ability, where this should help individuals to obviate the stress of academic and clinical assessments, could be an effective protective factor against stress, regardless of coping mechanisms.

Psychological morbidity

Psychological morbidity and its relationship to other psychological dimension measured in this study has already been discussed. However, in relation to the discussion of stress above, it should be noted that these increased in the timeframe of the present study and, in the absence of dropout from the programme, it could be hypothesised that they could continue to increase and that they could become severe and clinically relevant over a longer timeframe.

The main determinant of psychological morbidity was Neuroticism suggesting that administration of the NEOFFI prior to students embarking on a nursing programme could be of value. This is likely to be controversial; it is not suggested that this is used to screen potential students but, rather, to tailor support packages for individual students or to aid student advisors and counselors to understand and guide the students who seek their help. Understanding what 'makes a person tick' could be the first step to helping them.

Limitations

Limitations of the present study include the fact that only one cohort of students from one university was included in the study and this may not be representative of all nursing students in Hong Kong. The time between waves of the study was limited by the availability of the students in the classroom for the distribution of questionnaires and a longer time between waves incorporating a period of intense clinical practice between academic years, may have provided further insight into the relationships amongst the variables studied. Clearly, further time waves would be desirable. An additional limitation is that baseline data on levels of psychological morbidity, psychological support or psychotropic medication were not measured. Future studies could include these variables and take account of these baseline measures.

Conclusions and recommendations

This study has met its aim of understanding some of the relationships between a range of psychological variables and also in how these may be predictors of these variables in nursing students in Hong Kong. The low attrition of nursing students in Hong Kong is something that the schools of nursing and those who fund their study should be proud of but it could also be a statistic that hides a multitude of psychological sins requiring closer attention. There is little point in educating a person within a healthcare system, ultimately, to work in that system if they enter it as a casualty.

The main predictors of stress, burnout and psychological morbidity appear to be the personality trait Neuroticism and the strategy of Emotion-oriented coping with stress. These data are useful as they stand but the present work raises many questions which

could be answered by re-visiting the original research questions and incorporating them into a longer study, along with the questions raised by this study, following nursing students from entry to a programme to its conclusion and, possibly, into clinical practice.

On the other hand, the story regarding these students is not all negative. It is clear that conscientious students are more likely to use Task-oriented coping with stress and these students are the one most likely to feel Personal accomplishment on the nursing programme.

Recommendations arising from this study include the need to conduct a more representative study of nursing students in Hong Kong over a longer time, possibly following students through to completion of their programme and into practice as staff nurses. The study has shown that personality and coping factors are related to adverse psychological outcomes and this should alert university staff to the possibility that some students will cope badly with the stress of their nursing studies and may need additional support and guidance.

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Table 1

Correlations between wave 1 personality traits and coping styles with wave 1 dimensions of stress and burnout and general health

	SINS Clin	SINS Conf	SINS E	SINS F	MBI EE	MBI DP	MBI PA	GHQ
NEO-FFI N	.33**	.30**	.44**†	.24**	.52**	.28**	-.12	.60**
NEO-FFI E	-.12	-.15	-.23**	-.08	-.32**	-.19**	.28**	-.25**†
NEO-FFI O	-.09	-.10	-.09	-.01	-.13	-.23**	-.19†*	.08
NEO-FFI A	-.11	-.22**†	.00	-.18*	-.15	-.17*†	.06	-.09
NEO-FFI C	-.23**	-.26**	-.30**	-.25**†	-.21**†	-.21**†	.18*	-.24**†
CISS T	-.10	-.07	-.18*	.01	-.05	-.07	.40**	.03
CISS E	.18**	.21**	.28**	.23**	.42**	.41**	-.09	.45**
CISS A	-.08	.11	-.03	.19	-.07	.00	.05	-.17*
CISS D	-.01	.16*	.04	.21**	-.01	-.03	-.02	-.15
CISS S	-.16	-.05	.04	.21**	-.08	.03	.07	-.01

* p<.05; ** p<.01; † indicates correlations that become non-significant when Neuroticism is controlled for; see text and Table 2 for abbreviations; MBI EE: Emotional exhaustion; MBI DP: Depersonalisation; MBI PA: Personal accomplishment; SINS Clin: SINS Clinical; SINS Conf: SINS Confidence; SINS E: SINS Education; SINS F: SINS Finance; $139 \leq n \leq 146$

Table 2

Mean (SD) and stability data for psychological morbidity, dimensions of stress and burnout in nursing students at wave 1 and wave 2

	Wave 1	Wave 2	p-value for Wave 2-Wave1†	Stability coefficient‡	n
GHQ total score	11.7 (3.9)	13.1 (5.3)	.01	.41	99
SINS Clinical	3.0 (5.3)	27.7 (4.8)	<.001	.33	98
SINS Confidence	27.9 (5.3)	27.9 (5.3)	.214	.32	99
SINS Education	28.0 (5.0)	29.4 (4.5)	.001	.65	101
SINS Finances	13.1 (3.6)	13.8 (4.4)	.102	.39	103
MBI Emotional exhaustion	22.6 (7.7)	24.5 (9.2)	.045	.40	100
MBI Depersonalisation	1.4 (4.3)	11.5 (4.1)	.027	.26	101
MBI Personal accomplishment	29.1 (6.2)	27.0 (6.1)	.004	.32	100

† All comparisons were based on t-tests; ‡ All stability coefficient were significant at $p \leq .01$; See text and Table 6 for abbreviations

Table 3

Stepwise multiple regression

Dependent variable	Independent variable(s)	Adjusted R^2	Standardised β	p
GHQ	Neuroticism	.261	.520	<.001
Emotional exhaustion	Neuroticism	.319	.443	<.001
	Emotion-oriented coping	.344	.224	.049
Depersonalisation	Emotion-oriented coping	.086	.269	.014
	Agreeableness	.127	-.230	.035
Personal accomplishment	Neuroticism	.075	-.273	.012
	Personal accomplishment	.110	.217	.045
Clinical stress	Emotion-oriented coping	.178	.372	<.001
	Clinical	.236	.266	<.001

Confidence stress	Emotion-oriented coping	.165	.393	<.001
	Confidence	.235	.266	<.001
	Task-oriented coping	.272	-.214	<.001
Educational stress	Educational	.433	.570	<.001
	Emotion-oriented coping	.508	.290	<.001
Financial stress	Emotion-oriented coping	.162	.321	<.001
	Financial	.231	.293	<.001