

Cheung R. Y., & Au, T. K. (2011). Nursing students' anxiety and clinical performance. *Journal of Nursing Education*, 50, 286-289.

## Nursing Students' Anxiety and Clinical Performance

Ryan Yat-ming Cheung<sup>a</sup> and Terry Kit-fong Au<sup>b</sup>

The University of Hong Kong

<sup>a</sup>Ryan Yat-ming Cheung

Educational Psychologist Office, The Catholic Diocese of Hong Kong, Block C, Ground Floor, 2-8 Caine Road, Hong Kong. Telephone: 852-2525-5265 (work), 852-2525-5295 (fax). Email: [ryancheunghk@gmail.com](mailto:ryancheunghk@gmail.com). MSocSc (Educ. Psy.).

<sup>b</sup>Terry Kit-fong Au (Corresponding Author):

Department of Psychology, University of Hong Kong, Pokfulam Road, Hong Kong, China. Telephone: 852-2829-2383 (work), 852-2858-3518 (fax). Email: [terryau@hku.hk](mailto:terryau@hku.hk). PhD (Psychology)

### Acknowledgements

We thank Ella Kwan and Daniel Wong for their expert advice as nursing studies instructors, Ka-ki Chan, Ian Lam, and Rita Kit-yan Yau for their help with data coding, Cecilia Cheng, Samuel Ho, and Karen Ravn for their help in formulating our ideas.

**Abstract**

This study examined how mood states affect nursing students' performance on a treatment procedure consisting of a novel combination of familiar clinical steps. Thirty 3<sup>rd</sup>- and 4<sup>th</sup>-year Hong Kong Chinese nursing students were first taught the procedure and then, in randomly-assigned counterbalanced order, given both an anxious-mood and a calm-mood induction. Anxiety was induced by a video-clip of interviews with frontline nurses and doctors during the SARS epidemic in Hong Kong; calmness was induced by a video-clip of a nursing student's pleasant orientation to a clinical placement site. Nursing students were significantly less proficient at performing the newly-acquired procedure after an anxious-mood induction (focused on occupational risks) than after a calm-mood induction. Managing clinical-training-site anxiety among nursing students, then, may help to optimize learning and clinical performance. (127 words)

### **Nursing Students' Anxiety and Clinical Performance**

During the SARS outbreak in 2003, healthcare workers experienced considerable fear of being infected and infecting family members, friends, and colleagues (Maunder et al., 2003; Ho, Kwong-Lo, Mak, & Wong, 2005). Nurses reported more anxiety than other healthcare workers during the SARS epidemic, perhaps because their contact with patients was more frequent, more direct, and longer (Tam, Pang, Lam, & Chiu, 2004). Even nurses not working in SARS wards, or hospitals at all, reported anxiety and related physical symptoms (Chan et al., 2005). Can such anxiety affect nursing staff and students' clinical performance?

Preoccupation with perceived threats to safety and underestimation of one's coping ability can lead to anxiety (Barlow, 2002), which can in turn undermine performance by shifting attention to task-irrelevant information (Wine, 1971), disrupting well-learned complex sensorimotor sequences (Baumeister, 1984; Beilock & Carr, 2001). On the other hand, some evidence shows that anxiety can improve performance by focusing attention on the most threatening aspects of the environment (e.g., Easterbrook, 1959). Whether clinical-setting anxiety affects nursing staff and students' performance on procedures involving complex sensorimotor skills remains an open question.

Caring for patients with infectious diseases has always put nurses at risk. This problem is compounded by emerging infectious diseases such as HIV/AIDS, SARS, multi-drug-resistant tuberculosis, new strains of avian and swine flu, and so forth. To meet these challenges, we need a better understanding of how contagion anxiety of nursing staff and students — especially when confronting emerging infectious diseases — affects their clinical performance and self-protective behaviors. In one study, when novice nurses in an intensive care unit were feeling anxious, they were significantly less competent at performing an endotracheal suctioning procedure than their less anxious peers (Smith et al., 2001). But studies focusing on clinical-setting anxiety and clinical performance of nursing staff and students have been scarce. Even less is known about the impact of anxiety induced by emerging infectious diseases. The present study is a response to this research gap.

### **Method**

**Participants:** Thirty Hong Kong Chinese undergraduates (27 female; 3 male) in their 3<sup>rd</sup> or 4<sup>th</sup> year of 4-year nursing studies participated with written consent. Advanced-level nursing students, like novice nurses with limited clinical experience (e.g., Smith et al., 2001), were chosen because they might be relatively vulnerable to infection anxiety in the clinical setting.

**Overview:** To examine the causal relation between anxiety level and clinical performance, all participants underwent an anxious-mood induction and a calm-mood induction, in a random order counterbalanced across participants. They first learned a novel stitch-removal procedure. Their

performance on this clinical procedure was assessed twice — once after each mood induction session (anxious vs. calm).

**Stimulus Materials:** *Clips for mood induction.* Two video clips each about 3 minutes long were used for mood induction. The “anxiety-provoking” clip was edited from local TV documentaries about nurses and doctors during the 2003 SARS epidemic; the “calm” clip showed a pleasant orientation tour for a nursing student at a clinical placement site.

*Feeling scales.* Five mood-related items (worried, relaxed, nausea, moody, enjoyment of life) on different visual analogue scales (VAS) were used at baseline and three subsequent points to track anxiety level (Marzillier & Davey, 2005). McCormack, Horne, and Sheather (1988) evaluated the effectiveness of VAS and found them generally to have high levels of validity and reliability. Participants indicated how they felt at each time by marking a 100-mm line, which ranged from “excellent” to “worst possible.”

*Clinical performance assessment.* Participants watched a video demonstration of a special stitch-removal procedure consisting of steps already learned in their nursing curriculum. After each episode of mood induction, they were asked to perform the procedure. Their performance was evaluated by two independent raters with nursing-skill training, using a checklist based on clinical nursing skill textbooks (e.g., Koziar, Erb, Berman, & Burke, 2000) and consultation with two experienced clinical nursing instructors. Three types of errors were identified: major procedural errors (mixed or missed steps in standard clinical protocols; faulty skills); contamination errors (affecting the apparatus, dressing materials, or pseudo-wound); and minor mistakes (e.g., failing to explain the procedure to a patient or to cover the pseudo-wound site with thickened gauze). The raters did not know which kind of mood induction preceded any specific performance of the stitch-removal procedure; their average ratings were used in the data analysis. Inter-rater reliability was excellent (intraclass  $R_s > .97$ ). The scores were computed in two ways: one penalty point for each error regardless of the type (unweighted); two penalty points for each major procedural error or contamination error, and one penalty point for each minor mistake (weighted).

**Procedure:** *Baseline measure.* Participants were first asked to rate their feelings (worried, relaxed, nausea, moody, and enjoyment of life) on five different visual analogue scales (VAS; Time 1).

*First mood induction.* Participants were randomly assigned to watch either the “calm” or “anxiety-provoking” video clip first. They were told that they would be asked some questions about the clip to ensure their attention. Immediately after watching the mood-induction clip, participants rated their feelings using the VAS (Time 2). They then rated the clip’s effectiveness for recruiting people to the nursing profession; this offered cover for the mood induction procedure.

*Introduction to the stitch-removal procedure.* Participants then watched a video demonstration of a special stitch-removal procedure and were told that they would be given a prescription to perform a similar procedure afterwards as if in a real clinical set-up.

*Performing first stitch removal.* The prescription (for a stitched-up pseudo wound with a drain anchored by stitches) was “Off all stitches” – a prescription not typically found in clinical settings to simulate the unfamiliar clinical situations that nursing students or novice nurses often face in real life. A sensible response would be to clarify if the drain that was held by stitches should also be removed before administering the clinical protocol (see the “clinical performance assessment” section for further details). Each participant’s performance was videotaped for later coding.

*Neutralization of the first mood induction.* To minimize mood spillover of the first mood induction and stitch removal performance, participants watched a 10-minute “*Mr. Bean*” comedy video on the pretext of assessing how well the video could help nurses relax. Participants then rated their feelings (Time 3), offering an effectiveness check for the mood neutralization.

*Second mood induction.* If the “anxiety-provoking” video had been used in the first mood induction, the “calm” mood induction video was used here, and vice versa. Participants’ feelings were again measured to check the effectiveness of this second mood induction (Time 4).

*Second stitch removal.* The protocol was the same as for the first stitch removal, except that participants were not shown the demonstration video again.

## Results

**Mood Neutralization between Mood Induction:** To see if the “mood neutralization” was effective, self-reported mood states at baseline (Time 1) were compared with those immediately after watching the *Mr. Bean* video but before the second mood induction (Time 3). Matched-sample t-tests revealed no significant differences ( $ps > .05$ ; two-tailed for all t-tests reported here) for “worried,” “nausea,” “moody,” and “enjoyment of life.” Participants reported feeling more relaxed after watching the *Mr. Bean* video (Time 3) than at baseline (Time 1),  $t(29) = 2.6, p < .05$ . These results suggested that the mood states were generally comparable at the beginning of the two mood inductions.

**Mood Induction:** To assess the effect of mood induction in this within-participant experimental design, matched-sample t-tests compared self-reported mood states immediately after watching the “anxiety-provoking” video and the “calm” video. Significant differences were found for 4 of the 5 mood-rating items ( $ts(29) > 2.1, ps < .05$ ), and the remaining item (“enjoyment of life”) barely missed threshold ( $t(29) = 2.04, p = .05$ ). Importantly, significant differences in the predicted direction —

13.7 and 12.3 on a 100-point scale — were observed for “relaxed”,  $t(29) = 4.0, p < .001$ , and “worried”,  $t(29) = 3.7, p < .005$  respectively, pointing to a significantly more anxious state after the anxious-mood induction than after the calm-mood induction. In short, the mood induction procedure seemed to be effective.

**Simulated Clinical Task Performance:** No significant difference was found between the simulated clinical performances after the first and the second mood induction (matched- $t(29) = -1.3, p > .05$ ), suggesting no significant practice effect. To see how mood states may affect clinical performance, stitch-removal scores following the two kinds of mood induction were compared. Performance after the anxious-mood induction was significantly worse than that after the calm-mood induction, with a 6% increase in errors. This pattern of results held for both the unweighted and weighted error penalty: 1-point penalty for each error, matched- $t(29) = 2.5, p < .05$ , *Cohen's d* = .37; and 2-point penalty for each serious error and 1-point penalty for each minor error, matched- $t(29) = 2.8, p < .02$ , *Cohen's d* = .42.

## Discussion

This experiment set out to investigate how clinical-setting anxiety may affect nursing students' learning of new clinical procedures. Correlations between anxiety and clinical performance previously documented do not specify whether these two variables are causally related, and if so, what the causal direction might be. In this experiment, each nursing student served as his or her own control comparison, and mood was experimentally manipulated (anxious versus calm). The results suggest that anxiety about potential occupational hazards can undermine the learning and clinical performance of nursing students. The manipulation check ensured that the mood inductions were indeed effective. Additional procedural checks helped rule out alternative hypotheses such as mood spillover and order effects (e.g. practice effects). Ecological validity was boosted by consulting expert nursing instructors in designing the simulated clinical task and assessing performance. The excellent inter-coder agreement with respect to the videotaped behavioral data on the simulated clinical task also helped to strengthen the results of this experiment.

The results of this study generally support previous findings on the negative impact of anxiety on task performance (e.g., Baumeister, 1984; Beilock & Carr, 2001) and Smith et al.'s finding (2001) that novice nurses in an anxious mood tend to under-perform. Importantly, this study offers perhaps the first within-participant experimental study with a successful mood-induction procedure that documents how anxiety about occupational hazards can undermine job performance.

The emergence of highly infectious diseases and the anxiety or fear they cause can impair clinical performance. Previous studies on the psychological impact of SARS on nurses and doctors

have focused mainly on those working in frontline hospitals and wards treating the disease. The present study suggests that even nursing students not yet on the frontline can vividly experience negative emotions and anxiety just by watching a short video clip about the SARS epidemic. Such induced anxiety and negative emotions can actually cause the quality of their performance on a clinical procedure (e.g., stitch removal) to deteriorate.

Novel clinical procedures, especially newly imposed measures for an emerging infectious disease, might be especially vulnerable to anxiety-induced errors. Given the global threat of emerging infectious diseases, it seems crucial for nursing educators and nursing supervisors to formulate procedures and policies that will relieve the acute anxiety of nursing students and novice nurses in health crises like the SARS pandemic (Regehr & Bober, 2005). Even short breaks doing something relaxing might help (e.g., watching a good comedy video for 10 minutes—as seen in the mood neutralization step in our experimental procedure—or doing relaxation exercises).

This study only explored how nursing students were affected by anxiety in performing a relatively familiar procedure (i.e., a new combination of already learned treatment steps). It remains to be seen whether anxiety has an even greater effect on the learning and performance of novel clinical procedures required to treat new diseases. It would also be informative to examine the impact of anxiety on clinical performance in real clinical settings instead of using a simulated clinical task as in this experiment.

Despite these limitations, the present experiment suggests that anxiety about occupational hazards (e.g., new infectious diseases) can undermine the clinical performance of nursing students and perhaps also inexperienced nurses. If these findings hold up under further scrutiny, psychological support, anxiety-relieving interventions, as well as techniques for developing the resilience of nursing students and less experienced nurses (Bonanno, Galea, Bucciarelli, & Vlahov, 2007) should become an integral part of nursing education and management to maintain a high level of clinical learning and performance.

### References

- Barlow, D. H. (2002). *Anxiety and its Disorders: The Nature and Treatment of Anxiety and Panic* (2<sup>nd</sup> ed.). New York: Guilford Press.
- Baumeister, R. F. (1984). Choking under pressure: Self-consciousness and paradoxical effects on incentives on skillful performance. *Journal of Personality and Social Psychology*, *46*, 610-620.
- Beilock, S. L., & Carr, T. H. (2001). On the fragility of skilled performance: What governs choking under pressure? *Journal of Experimental Psychology: General*, *130*, 701-725.
- Bonanno, G. A., Galea, S., Bucciarelli, A., & Vlahov, D. (2007). What predicts psychological resilience after disaster? The role of demographics, resources, and life stress. *Journal of Consulting and Clinical Psychology*, *75*, 671-682.
- Chan, S. S. C., Leung, G. M., Tiwari, A. F. Y., Salili, F., Leung, S. S. K., Wong, D. C. N., et al. (2005). The impact of work-related risk on nurses during the SARS outbreak in Hong Kong. *Family and Community Health*, *28*, 274-287.
- Easterbrook, J. A. (1959). The effect of emotion on cue utilization and the organization of behavior. *Psychological Review*, *66*, 183-201
- Ho, S. M. Y., Kwong-Lo, R. S. Y., Mak, C. W. Y., & Wong, J. S. (2005). Fear of Severe Acute Respiratory Syndrome (SARS) among health care workers. *Journal of Consulting and Clinical Psychology*, *73*, 344-349.
- Kozier, B., Erb, G., Berman, A. J., & Burke, K. (2000). *Fundamentals of Nursing – Concepts, Process, and Practice* (6th ed.). Upper Saddle River, N.J.: Prentice-Hall.
- Marzillier, S. L., & Davey, G. C. L. (2005). Anxiety and digest: Evidence for a unidirectional relationship. *Cognition and Emotion*, *19*, 729-750.
- Maunder, R., Hunter, J., Vincent, L., Bennett, J., Peladeau, N., Leszcz, M., Sadavoy, J., Verhaeghe, L., Steinberg, R., & Mazzulli, T. (2003). The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. *Canadian Medical Association Journal*, *168*, 1245-1251.
- McCormack, H. M., Horne, D. J., & Sheather, S. (1988). Clinical applications of visual analogue scales: A critical review. *Psychological Medicine*, *18*, 1007-1019.
- Regehr, C., & Bober, T. (2005). *In the line of fire: Trauma in the emergency services*. Oxford: Oxford University Press.
- Smith, A. M., Ortiguera, S. A., Laskowski, E. R., Hartman, A. D., Mullenbach, D. M., Gaines, K. A., et al. (2001). A preliminary analysis of psychophysiological variables and nursing performance in situations of increasing criticality. *Mayo Clinic Proceedings*, *76*, 275-284.
- Tam, C. W. C., Pang, E. P. F., Lam, L. C. W., & Chiu, H. F. K. (2004). Severe acute respiratory syndrome (SARS) in Hong Kong in 2003: stress and psychological impact among frontline healthcare workers. *Psychological Medicine*, *34*, 1179-1204.
- Wine, J. (1971). Test anxiety and direction of attention. *Psychological Bulletin*, *76*, 92-104.