

## PEER REVIEW HISTORY

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### ARTICLE DETAILS

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| <b>TITLE (PROVISIONAL)</b> | Job burnout among critical care nurses from 14 adult ICUs in northeastern China: a cross-sectional survey |
| <b>AUTHORS</b>             | Zhang, Xiao-Chun; Huang, De-Sheng; Guan, Peng   |

### VERSION 1 - REVIEW

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| <b>REVIEWER</b>        | jean-roger le gall<br>French medicine academy<br>Medical intensive care in saint louis hospital,paris |
| <b>REVIEW RETURNED</b> | 29-Mar-2014   |

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| <b>GENERAL COMMENTS</b> | <p>Do not write SUBLIN study in the title.<br/>The sigles EE,DP,PA must be defined in the abstract (result section)<br/>"this kind of investigaion could catch more attention " is not clear.<br/>In intro: the tense relationship between doctor and nurses is not detailed.<br/>In the discussion,you say 16% of nurses, then: 43%,%23,1%... what are those percentages referred for??</p> <p>THE AIMS AND DISCUSSION MUST BE MORE PRECISE...</p> |
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| <b>REVIEWER</b>        | Wolfgang Lederer<br>Innsbruck Medical University<br>Austria |
| <b>REVIEW RETURNED</b> | 03-Apr-2014   |

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| <b>GENERAL COMMENTS</b> | <p>The paper makes a contribution to the research field of prevalence of occupational burnout in ICU nurses at surgical and medical ICUs in Liaoning, China.<br/>The main strengths of the paper are the pertinence of the topic and the high number of participants.<br/>However, more detailed information on participants and a transparent subgroup analysis is required. Data in tables 1 and 2 need to be completed in order to scrutinize the statistical analysis and contribute to clarity and conciseness.</p> <p>What was the hypothesis?</p> <p>In subgroup analysis, what is the background of having selected the very group (e.g. age or gender).</p> <p>How were missing data addressed ?</p> |
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Subgroup analysis: for ordinal data in samples that have no dependency on a parameter Mann-Whitney U Test for comparison between two groups or the Kruskal-Wallis Test for comparison between more than two groups would be appropriate.

General comments:

The manuscript deals with an important issue. The authors performed a cross-sectional survey using the self-reporting Chinese version of Maslach Burnout Inventory (MBI-C). Prevalence of burnout was taken as key variable.

Specific comments:

#### Methods

In order to estimate the degree of selection bias in this study, the accurate response rate would be helpful. Please provide the total number of eligible participants in 17 ICUs of whom 431 responded and 426 participated. (in case of complex selection, you could distinguish in a flow-chart between potentially eligible, examined for eligibility, confirmed eligible, enrolled and analyzed cases)

More clearly state how you could guarantee anonymity to participants. Who informed the eligible participants about the survey? Were questionnaires completed at home or on the working place? How were questionnaires collected?

Please clearly state that participation was voluntary and based on the understanding that results would be published. Procedures should be in accordance with the Declaration of Helsinki and be approved by the institutional ethics committee and committee for research.

Provide the used definitions of the three burnout subscales of MBI-

C:

emotional exhaustion (e.g. feeling of being emotionally overextended through one's work), depersonalization (e.g. cynical attitudes toward the recipients of one's work or care) and lack of personal accomplishment (e.g. loss of competence and successful achievement in one's work) and provide a reference.

The total score is commonly categorized as low, average or high according to predetermined cut-off scores. The cut-off levels for definition of burnout in this survey differ from what is used in other studies (> 27 for emotional exhaustion), > 10 for depersonalization, < 40 for personal accomplishment). However, cut-off points should be nation-specific and clinically derived to respond to cultural values, traditional gender roles and others. ([Schaufeli WB & Van Dierendonck D](#). A cautionary note about the cross-national and clinical validity of cut-off points for the Maslach Burnout Inventory. [Psychol Rep](#). 1995;76(3):1083-90.)

Did you apply nation specific cut-off points in your survey?

#### Statistical analysis

What was your hypothesis?

When calculating subgroup analysis, explain the background of your choice, why did you select the very group (e.g. age or gender).

How did you address missing data?

In discussion page 12, line 3 you indicate that demographic data from only three participating ICUs were available???

Does this mean, that subgroup analysis is restricted to the results of only three ICUs?

Please clarify!

When analyzing differences between subgroups regarding ordinal data in samples that have no dependency on a [parameter](#) suggest to apply the Mann-Whitney U Test for comparison between two groups or the Kruskal-Wallis Test for comparison between more than two groups.

### Results

Provide the accurate response rate.

Complete data in table 1 adding some more information regarding characteristics of participants e.g. age, gender, marital status, education level, professional position, years of employment as ICU nurse, ...

Provide more detailed information on level of education, type of work (full time public part time public, full time university, part time university) and years of employment at ICU.

Provide more detailed data on subgroup analysis in table 2.

In your analysis did you calculate with years of experience as registered nurse or with years of experience as registered ICU nurse?

### Discussion

Give a few reasons for non-participation, in particular why voluntary participation was so high in 14 ICUs but completely refused in three ICUs?

There are a few characteristics that should be taken into account when focusing on the prevalence and the prevention of occupational burnout in order to develop effective interventions:

Both subscales, emotional exhaustion and depersonalization can discriminate between burned out and non-burned out employees ([Schaufeli WB](#). Et al. on the clinical validity of the maslach burnout inventory and the burnout measure. [Psychol Health](#). 2001;16(5):565-82.). There is a linear relationship between emotional exhaustion and depersonalization. On the other hand high depersonalization and low personal accomplishment can be seen in the light of coping strategies against emotional exhaustion. Low levels of personal accomplishment and high degree of depersonalization in the burnout scores may actually be protective against stress. ([Onder C](#), [Basim N](#). Examination of developmental models of occupational burnout using burnout profiles of nurses. [J Adv Nurs](#). 2008;64(5):514-23.)

Moreover, high levels of emotional exhaustion cause stress and that stress causes

high levels of emotional exhaustion. In addition, depersonalization may reduce stress, whereas high degrees of personal accomplishment may increase stress levels. (McManus IC et al. [The causal links between stress and burnout in a longitudinal study of UK doctors](#). [Lancet](#). 2002;359(9323):2089-90.).

Discuss more in detail the external validity of your findings. Wu et al. reported that lower educational status was associated with higher levels of burnout in young nurses. Predictors of emotional exhaustion were identified as role overload, responsibility, role insufficiency and self-care ([Wu S](#). et al. Relationship between burnout and occupational stress among nurses in China. [J Adv Nurs](#). 2007;59(3):233-9.). I suggest to compare and discuss the findings of your study with the results of Wu et al.

Employee attitude and behavior in organizations are influenced by

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|  | <p>the structure of work environment, in particular power and opportunity. Empowerment depends on access to information, support and resources necessary to perform one's work. Which variables could have influenced the levels of perceived burnout in your study?</p> <p>When reflecting your results what is the potential of burnout prevention?</p> |
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### VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name jean-roger le gall

Institution and Country French medecine academy

Medical intersive care in saint louis hospital,paris

Please state any competing interests or state 'None declared': none

THE AIMS AND DISCUSSION MUST BE MORE PRECISE...

Do not write SUBLIN study in the title.

Reply: We have removed the SUBLIN study in the title.

The sigles EE,DP,PA must be defined in the abstract (result section)

Reply: We have modified these singles into their original full names.

"this kind of investigaion could catch more attention " is not clear.

Reply: We have changed the sentence as follows, 'The investigation into the burnout level of this population could catch more attention to ICU caregivers.'

In intro: the tense relationship between doctor and nurses is not detailed.

Reply: We have changed the expression as follows (Page 4), 'There is tense relationship between doctors and patients, an online survey revealed that 66% of 14,577 doctors said that their hospitals encountered one to three medical disputes per month.[10]'

In the discussion,you say 16% of nurses, then: 43%,%23,1%... what are those percentages referred for??

We have changed the expression as follows (Page 13), 'For each subscale, the highest proportion of high-degree (43.2%) was found in the emotional exhaustion subscale, followed by 41.2% in personal accomplishment subscale and 26.1% in depersonalization subscale.'

Reviewer: 2

Reviewer Name Wolfgang Lederer

Institution and Country Innsbruck Medical University

Austria

Please state any competing interests or state 'None declared': none declared

The paper makes a contribution to the research field of prevalence of occupational burnout in ICU nurses at surgical and medical ICUs in Liaoning, China.

The main strengths of the paper are the pertinence of the topic and the high number of participants. However, more detailed information on participants and a transparent subgroup analysis is required. Data in tables 1 and 2 need to be completed in order to scrutinize the statistical analysis and contribute to clarity and conciseness.

What was the hypothesis? In subgroup analysis, what is the background of having selected the very group (e.g. age or gender). How were missing data addressed ?

Reply: We have added the background of selecting the very group in the part of Statistical analysis (Page 7 to 8), 'In China, most of the nurses are females, male nurses, as the minority part, may stay at different level of job burnout when being compared with the counterpart female nurses. Thus, the subgroup analysis was conducted to test the differences between male nurses and females. There is increasing emphasis on higher entrance requirements of ICU nurses and the amount of nurses' salary are closely related to the job rank. And the job rank of the nurses highly rely on the education level, the length of service, the quantity and quality of scientific output, for example, the number of first-authored publications, thus the education level, job rank, years of employment as a registered nurse, and years of employment as an ICU nurse were considered for subgroup analysis.' The questionnaires were all completed questionnaires, no missing data.

Subgroup analysis: for ordinal data in samples that have no dependency on a parameter Mann-Whitney U Test for comparison between two groups or the Kruskal-Wallis Test for comparison between more than two groups would be appropriate.

Reply: We have adopted Mann-Whitney U Test for comparison between two groups and the Kruskal-Wallis Test for 3 or more groups (described in the part of Statistical analysis Page 8 ), and corrected the P values in Table 2.

General comments:

The manuscript deals with an important issue. The authors performed a cross-sectional survey using the self-reporting Chinese version of Maslach Burnout Inventory (MBI-C). Prevalence of burnout was taken as key variable.

Specific comments:

Methods

In order to estimate the degree of selection bias in this study, the accurate response rate would be helpful. Please provide the total number of eligible participants in 17 ICUs of whom 431 responded and 426 participated. (in case of complex selection, you could distinguish in a flow-chart between potentially eligible, examined for eligibility, confirmed eligible, enrolled and analyzed cases)

Reply: We added the description of selection process (Page 5) and provided the flow-chart (Page 7).

More clearly state how you could guarantee anonymity to participants. Who informed the eligible participants about the survey? Were questionnaires completed at home or on the working place? How were questionnaires collected?

Reply: More descriptions have been added in the section of Study units and subjects (Page 5).

Please clearly state that participation was voluntary and based on the understanding that results would be published. Procedures should be in accordance with the Declaration of Helsinki and be approved by the institutional ethics committee and committee for research.

Reply: We have added the description 'After the head nurse informed the eligible participants about the survey, the head nurse in each ICU also explained that the participation was purely voluntary and the results that based on the collected questionnaire data would be published or presented in an academic symposium on ICU nursing. The head nurse designated at least 2 people to collect the completed questionnaires and check the integrity.' (Page 5)

Provide the used definitions of the three burnout subscales of MBI-C:

emotional exhaustion (e.g. feeling of being emotionally overextended through one's work), depersonalization (e.g. cynical attitudes toward the recipients of one's work or care) and lack of personal accomplishment (e.g. loss of competence and successful achievement in one's work) and provide a reference.

Reply: We have added the following definition and provided the reference (page 6), 'The items in the emotional exhaustion subscale describe the feelings of being emotionally overextended and exhausted by one's work, the items in the Depersonalization subscale describe an unfeeling and impersonal response towards recipients of one's care or service, and the items in the personal accomplishment subscale describe feelings of competence and successful achievement in one's work with people.[13]

The total score is commonly categorized as low, average or high according to predetermined cut-off scores. The cut-off levels for definition of burnout in this survey differ from what is used in other studies (> 27 for emotional exhaustion), > 10 for depersonalization, < 40 for personal accomplishment). However, cut-off points should be nation-specific and clinically derived to respond to cultural values, traditional gender roles and others. (Schaufeli WB & Van Dierendonck D. A cautionary note about the cross-national and clinical validity of cut-off points for the Maslach Burnout Inventory. Psychol Rep. 1995;76(3):1083-90.) Did you apply nation specific cut-off points in your survey?

Reply: Thanks for the reference suggestion, we have added the following description 'It has been indicated that cut-off points should be nation-specific and clinically derived to respond to cultural values, traditional gender roles and others.[15] Cut-off criteria of the MBI-HSS-C in the present study was discussed and determined by the project core team member, EE:low, less than 19, moderate, 19-26, high more than 26, DP: low: less than 6, moderate, 6-9, high, more than 9, and PA: low, more than 39, moderate 34-39, high, less than 34.[16]' (Page 6)

#### Statistical analysis

What was your hypothesis? When calculating subgroup analysis, explain the background of your choice, why did you select the very group (e.g. age or gender). How did you address missing data?

Reply: We have added the background of selecting the very group in the part of Statistical analysis (Page 7 to 8).

In discussion page 12, line 3 you indicate that demographic data from only three participating ICUs were available??? Does this mean, that subgroup analysis is restricted to the results of only three ICUs?

Please clarify!

Reply: We have changed the expression as follows, 'Thirdly, the number of nurses in each participating hospital was more than one thousand, the demographic data of total registered nurses in the hospital was available for 3 hospitals, thus those data for the ICU nurses from those 3 nested ICUs could be compared to the total registered nurses of the hospital, and no statistical differences were found.'(Page 14)

When analyzing differences between subgroups regarding ordinal data in samples that have no dependency on a parameter I suggest to apply the Mann-Whitney U Test for comparison between two groups or the Kruskal-Wallis Test for comparison between more than two groups.

Reply: We have adopted Mann-Whitney U Test for comparison between two groups and the Kruskal-Wallis Test for 3 or more groups (described in the part of Statistical analysis Page 8 ), and corrected the P values in Table 2.

#### Results

Provide the accurate response rate.

Reply: We have provided the response status for the ICUs (Page 8) and the participants (Page 10) as follows,

Among the invited 17 ICUs, 14 ICUs from 10 tertiary level hospitals responded actively and were included in the present study. For those uninvolved 3 ICUs, one ICU was at the rearrangement stage



due to the decoration during the study period, one ICU was at the beginning stage of being short of ICU nurses, and one ICU was open-type ICU that the management mode was distinct from the other ICUs.

After the introduction of the study objectives provided for 431 participants, five nurses finally refused to join and 426 copies of complete questionnaires were returned, resulting in the response rate was 98.8%.

Complete data in table 1 adding some more information regarding characteristics of participants e.g. age, gender, marital status, education level, professional position, years of employment as ICU nurse, ...

Provide more detailed information on level of education, type of work (full time public part time public, full time university, part time university) and years of employment at ICU. Provide more detailed data on subgroup analysis in table 2.

Reply: Those data have been provided in Table 2, (Page 11 to 12)

In your analysis did you calculate with years of experience as registered nurse or with years of experience as registered ICU nurse?

Reply: Yes, those result have been provided in the latter part of Table 2 (Page 12, Table 2 now occupies 2 pages)

#### Discussion

Give a few reasons for non-participation, in particular why voluntary participation was so high in 14 ICUs but completely refused in three ICUs?

Reply: The reasons have been provided in the section of results (Page 8).

There are a few characteristics that should be taken into account when focusing on the prevalence and the prevention of occupational burnout in order to develop effective interventions:

Both subscales, emotional exhaustion and depersonalization can discriminate between burned out and non-burned out employees (Schaufeli WB. Et al. on the clinical validity of the maslach burnout inventory and the burnout measure. *Psychol Health*. 2001;16(5):565-82.). There is a linear relationship between emotional exhaustion and depersonalization. On the other hand high depersonalization and low personal accomplishment can be seen in the light of coping strategies against emotional exhaustion. Low levels of personal accomplishment and high degree of depersonalization in the burnout scores may actually be protective against stress. (Onder C, Basim N. Examination of developmental models of occupational burnout using burnout profiles of nurses. *J Adv Nurs*. 2008;64(5):514-23.)

Moreover, high levels of emotional exhaustion cause stress and that stress causes high levels of emotional exhaustion. In addition, depersonalization may reduce stress, whereas high degrees of personal accomplishment may increase stress levels. (McManus IC et al. The causal links between stress and burnout in a longitudinal study of UK doctors. *Lancet*. 2002;359(9323):2089-90.).

Reply: Thanks for the suggestions and the references, the discussion has been added in the second paragraph of Discussion section (Page 13).

Discuss more in detail the external validity of your findings. Wu et al. reported that lower educational status was associated with higher levels of burnout in young nurses. Predictors of emotional exhaustion were identified as role overload, responsibility, role insufficiency and self-care (Wu S. et al. Relationship between burnout and occupational stress among nurses in China. *J Adv Nurs*. 2007;59(3):233-9.). I suggest to compare and discuss the findings of your study with the results of Wu et al.

Reply: We have added the comparison with Wu's study and provided discussion (Page 14 and 15) Employee attitude and behavior in organizations are influenced by the structure of work environment, in particular power and opportunity. Empowerment depends on access to information, support and resources necessary to perform one's work. Which variables could have influenced the levels of perceived burnout in your study? When reflecting your results what is the potential of burnout prevention?

Reply: The last sentence might provide clues for the potential of our results, ‘High-risk factors[27] and possible protective factors[28,29] that associated with burnout level in Liaoning ICU nurses, such as work environment, job satisfaction, social support and coping strategies will be explored in the next stage of the SUBLIN study.’

### VERSION 2 – REVIEW

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| <b>REVIEWER</b>        | Wolfgang Lederer<br>Innsbruck Medical University<br>Austria |
| <b>REVIEW RETURNED</b> | 30-May-2014   |

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| <b>GENERAL COMMENTS</b> | <p>Major Comment:<br/>Please, indicate the accurate response rate:</p> <p>Page 2, line 12:<br/>The accurate response rate should be calculated from the number of potentially eligible ICU nurses (total number of employed nurses) of 17 eligible ICUs in relation to the number of analyzed ICU nurses (426 in fourteen ICUs).</p> <p>Minor comments:<br/>Please, brush up the syntax</p> <p>Page 3, line 5:<br/>Complete to: responding ICU nurses</p> <p>Page 3, line 9:<br/>Delete: and (etc. already means “and others”)</p> <p>Page 5, line 2:<br/>Indicate the total number of ICU nurses employed in the 17 ICUs from ten tertiary level hospitals selected as target population?</p> <p>Page 6, line 2/3:<br/>Combine the two sentences</p> <p>Page 6, line 14<br/>Correct to: scores</p> <p>Page 6, line 22<br/>Delete: those<br/>Delete: that</p> <p>Page 7, line 9:<br/>Either delete: they was<br/>or correct to: they were</p> <p>page 7, line 24<br/>Usually numbers below 15 are expressed in verbalized form in the manuscript, e.g.<br/>... fourteen ICUs from ten tertiary level hospitals responded actively and were included in the present study (Figure 1). For those uninvolved three ICUs,</p> <p>Page 10, line 2/3:</p> |
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|  | <p>Change wording to:<br/>Out of 431 enrolled participants, 426 (98.8%) responded. Five nurses refused to return the questionnaire.</p> <p>Page10, line 9<br/>Indicate p-value</p> <p>Page10, line 15<br/>Indicate p-value</p> <p>Page 11, table 2<br/>Complete heading ,e.g<br/>Prevalence of emotional exhaustion (EE), depersonalization (DP) and personal accomplishment (PA) related to sociodemographic characteristics in 426 ICU nurses in Liaoning province, China.</p> <p>Consider, whether statistical information can be presented more clearly with emotional exhaustion (EE), depersonalization (DP) and personal accomplishment (PA) in three separate tables.</p> <p>Page 14, line 2<br/>Include in limitations reasons for non-participation of three ICUs</p> <p>Page 14, line 26<br/>Avoid nested sentences! Provide information in two separate sentences.<br/>Add the reference [24] after the first sentence, e.g.<br/>..... nurses in Henan province in China. [24] In this study the participants were all ....</p> <p>Page 15, line 2<br/>Provide information in two separate sentences<br/>..... commonly experience burnout. The authors reported ....</p> <p>Page 15, line 6<br/>Delete: that</p> |
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## VERSION 2 – AUTHOR RESPONSE

-Reviewer(s)' Comments to Author:

Major Comment:

Please, indicate the accurate response rate:

Page 2, line 12:

The accurate response rate should be calculated from the number of potentially eligible ICU nurses (total number of employed nurses) of 17 eligible ICUs in relation to the number of analyzed ICU nurses (426 in fourteen ICUs).

Reply: We have added the accurate response rate, 87.7%. Altogether, 486 potentially eligible ICU nurses from those seventeen invited intensive care units.

Minor comments:

Please, brush up the syntax

Page 3, line 5:

Complete to: responding ICU nurses

Reply: responding ICU nurse added

Page 3, line 9:

Delete: and (etc. already means “and others”)

Reply: ‘and’ deleted

Page 5, line 2:

Indicate the total number of ICU nurses employed in the 17 ICUs from ten tertiary level hospitals selected as target population?

Reply: 486 ICU nurses added

Page 6, line 2/3:

Combine the two sentences

Reply: Two sentences combined,

Page 6, line 14

Correct to: scores

Reply: corrected

Page 6, line 22

Delete: those

Delete: that

Reply: ‘those’ and ‘that’ deleted.

Page 7, line 9:

Either delete: they was

or correct to: they were

Reply: ‘they was’ deleted.

page 7, line 24

Usually numbers below 15 are expressed in verbalized form in the manuscript, e.g.

... fourteen ICUs from ten tertiary level hospitals responded actively and were

included in the present study (Figure 1). For those uninvolved three ICUs,

Reply: corrected according to the reviewer’s suggestions, thanks.

Page 10, line 2/3:

Change wording to:

Out of 431 enrolled participants, 426 (98.8%) responded. Five nurses refused to return the questionnaire.

Reply: Corrected according to the reviewer’s suggestions, thanks.

Page 10, line 9

Indicate p-value

Reply: p-value provided.

Page 10, line 15

Indicate p-value

Reply: p-value provided.

Page 11, table 2

Complete heading ,e.g

Prevalence of emotional exhaustion (EE), depersonalization (DP) and personal accomplishment (PA)

related to sociodemographic characteristics in 426 ICU nurses in Liaoning province, China.

Reply: Table 2 heading completed, thanks.

Consider, whether statistical information can be presented more clearly with emotional exhaustion (EE), depersonalization (DP) and personal accomplishment (PA) in three separate tables.

Reply: Many thanks for the suggestions, if the statistical information presented with EE, DP and PA in three separate tables, the variable column will be presented three more times, so we hope to keep the statistical information with EE, DP and PA in one table.

Page 14, line 2

Include in limitations reasons for non-participation of three ICUs

Reply: Reasons for non-participation of three ICUs included in limitations.

Page 14, line 26

Avoid nested sentences! Provide information in two separate sentences.

Add the reference [24] after the first sentence, e.g.

..... nurses in Henan province in China. [24] In this study the participants were all ....

Reply: Corrected according to the reviewer's suggestions, thanks.

Page 15, line 2

Provide information in two separate sentences

..... commonly experience burnout. The authors reported ....

Reply: Corrected according to the reviewer's suggestions, thanks.

Page 15, line 6

Delete: that

Reply: 'that' deleted.