Authors' Response to the Reviewers' Comments

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Title: The experience of emotional labor and its related factors among nurses in general hospital setting in Republic of Korea: a systematic review and meta-analysis

- **Response to Comments from academic editor**

Comment 1:

1. To complete the manuscript, it would be interesting to include in the text a mention of the job demands-resources model (Demerouti et al., 2001) to provide a theoretical foundation for understanding and explaining the relationship between emotional labor and burnout syndrome. Additionally, affective events theory (Weiss and Cropanzano 1996) or emotion regulation theory (Gross, 1998) are used as the theoretical foundation of most research in the emotional labor literature. What is your contribution to these theories or what is your findings' meaning in terms of these theories?

Response:

Thank you for the comment. I think the job demands-resources model is meant to embody organizational-level engagement with employee job burnout. And this perspective is consistent with the argument in our manuscript that hospital-level engagement is needed to improve nurses' mental health and, ultimately, patient safety outcomes. Therefore, we emphasized this relevance and have described the job demands-resources model to Introduction and Discussion parts.

"Korea's medical services are over-croweded, and nurses in Korea are required to have high levels of emotional labor and work intensely. The job demands-resources model proposed by Demerouti and colleagues presented the contributing factors of job burnout and job engagement that can be applied to various occupational environments, including nursing [15]. Job demands refer to physical, psychological, social, or organizational aspects of the job, that require sustained physical and/or psychological effort or skills [15], and in particular, psychological demands can be conceptualized as emotional labor that can lead to emotional exhaustion [16]. A recent integrative review found three key job demands of nursing staff including work overload, lack of formal rewards, and work-life interference, and six key job resources including supervisor support, fair and authentic management, transformational leadership, interpersonal relations, autonomy and professional resources [17]. Therefore, elucidating the relationship between these job demands- resources and emotional labor can be utilized to improve the environment for maintaining good mental health and well-being as well as for improving

emotional labor and exhaustion of nurses at the organizational level."

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"Other factors at the hospital level may also be related to the impact of emotional labor. Among the studies included in this review, Oh et al. used three-step mediated regression and found that relationship-oriented culture and innovation-oriented culture partially mediated the relationship between the frequency of emotional labor and turnover intention [154]. Kim et al. used a composite-indicator structural equation model and found that workplace violence mediated the relationship between emotional labor and burnout [75]. The relationship between emotional labor and burnout can be further understood in the job demands-resources model [15]. According to the results of included studies, emotional labor in Korean nurses was positively correlated with workload, physical labor, work-family conflict, workplace violence, physical threat, perceived emotion requirement, emotional display rule, and demands at work, while negatively correlated with organization engagement, work engagement, nurses' work environment, job autonomy, organization support, coworker support, and supervisor support (**Supplementary File 6**). These findings are consistent with the results of a recent integrative review [17], and the emotional labor-related job demands-resources can be considered in establishing hospital-level strategies for improving emotional labor and burnout of Korean nurses."

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And in the case of the affective events theory, some factors such as mistreatment by patients as well as emotional labor of nurses seem to be considered as the affective events, which may affect their job satisfaction. Therefore, we added some descriptions to the Discussion section.

"At the individual level, some other factors may have a protective effect against the detrimental effects of emotional labor. Among the studies included in this review, Byeon et al. and Jung et al. found that resilience can mediate the relationship between emotional labor and job satisfaction [68] or the relationship between emotional labor and depression [74], respectively. Lee et al. used structural equation modeling and path analysis and found that enjoyment, pride, and anger mediated the relationship between deep acting and job satisfaction [81]. Yeo used stepwise multiple regression and found that positive psychological capital partially mediated the relationship between emotional labor and job satisfaction [150]. These findings show that an individual's positive psychological capital, including resilience, can mitigate the detrimental effects of emotional labor in nurses. On the other hand, based on the affective events theory [204], emotional experiences such as mistreatment by patients in the work environment can potentially have detrimental effects by influencing nurses' attitudes toward their jobs and their organizational behavior. According to the findings of this review, verbal violence and physical treat were reported to be positively correlated with emotional labor, while job satisfaction showed a negative correlation with emotional labor of Korea nurses (**Supplementary File 6**). Some aspects of emotional labor, such as suppression of one's emotions or an attempt to identify one's inner self with the desired

emotions, can be considered as a kind of emotional experience of nurses at workplace. Therefore, strategies to minimize negative affective events such as violence and enhance job satisfaction can be considered in order to reduce the harmful effects of emotional labor in this population."

(Please see page 11, red words)

Finally, in the case of the emotional regulation strategies, it may be helpful to better understand surface acting and deep acting, which are aspects of emotional labor. Therefore, some descriptions have also been added to the Discussion section.

"The mode of emotional expression also seems to be an important factor related to the effect of emotional labor on nursing care. Ko et al. used multiple regression and found that emotional dissonance was a mediating factor between surface acting of emotional labor, but not deep acting and burnout [69]. Surface acting can be defined as "employees modify their displays without shaping inner feelings", while deep acting as "employees modify internal feelings to be consistent with display rules [205]." Gross categorized the emotional regulation strategies as antecedent-focused and response-focused emotion regulation, and the former related to reappraisal and the latter to suppression [206]. Although both of these strategies may be effective in reducing emotion-expressive behavior, reappraisal reduces disgust experience, whereas suppression is associated with sympathetic activation and has the potential to have detrimental health effects [206]. Surface acting and deep acting of emotional labor can be understood in the context of suppression and reappraisal, respectively [9]. According to the path analysis conducted by Han et al., deep acting directly and indirectly increases the level of service delivery and customer orientation, whereas surface acting indirectly decreases it [70]. Kim used multiple regression and found that the frequency of emotional expression and emotional incongruity negatively affect job satisfaction, whereas the level of emotional expression positively affects it [104]. Lee et al. (2018b) used hierarchical regression and the Sobel test and found that emotional modulation efforts buffered the effects of customer orientation on posttraumatic growth [80]. In other words, emotional labor can affect nurses' attitudes toward patients, including customer orientation, and some emotional expression-related factors such as emotional dissonance, surface acting, and emotional modulation efforts may mediate this effect, but these factors are also related to the work environment. Therefore, some Korean researchers have suggested that it would be promising to develop interventions that improve deep acting and work engagement to reduce the adverse effects of emotional labor in clinical nursing settings [70]. These suggestions are consistent with previous studies that deep acting, but not surface acting, which is one aspect of emotional labor, can have a positive effect on individual mental health and well-being [13,14]. The findings of this review emphasize that, as a whole, deep acting in Korean nurses is positively related to variables such as self-efficacy, authentic leadership, enjoyment, pride, job satisfaction, and job embeddedness **(Supplementary File 6)**. Therefore, as well as lowering the overall emotional labor level in this population, reducing surface acting and facilitating deep acting may be a promising approach for establishing nurse mental health management strategies. Furthermore, levels of surface acting (SMD, 3.29; 95% CI, 3.18 to 3.41) and deep acting (SMD, 3.39; 95% CI, 3.27 to 3.51) of this population found in this meta-analysis should be interpreted in this context."

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Comment 2:

2. In the sentence: "Not only the improvement of nurses' mental health is important to improve their overall health and quality of life [3], but also their good mental health is essential for patient safety [5,6] and efficient use of medical resources, such as organizational commitment and productivity [6]."

I think there is still some redundancy in the sentence. I suggest changing the second "improve" to "enhance".

Response:

Thank you for the comment. As you pointed out, we modified the expression improve to enhance.

"Not only the improvement of nurses' mental health is important to enhance their overall health and quality of life [3], but also their good mental health is essential for patient safety [5,6] and efficient use of medical resources, such as organizational commitment and productivity [6]."

(Please see pages 1-2, red words)

- **Response to Comments from Reviewer 1**

Comment 1:

Thank you for sufficient additional explanation on methodology in revised manuscript.

Response:

Thank you for your time and effort devoted to reviewing this manuscript.

Comment 2:

On the other hand theoretical contribution of this study is still need to be explained. What is the theoretical background of this study? It's still not clear which theory or approach is the basis of this study. For instance, the job demands-resources model (Demerouti et al., 2001) provide a theoretical foundation for understanding and explaining the relationship between emotional labor and burnout syndrome. Additionally, affective events theory (Weiss and Cropanzano 1996) or emotion regulation theory (Gross, 1998) are used as the theoretical foundation of most research in the emotional labor literature. What is your contribution to these theories or what is your findings' meaning in terms of these theories?

Response:

Thank you for the comment. I think the job demands-resources model is meant to embody organizational-level engagement with employee job burnout. And this perspective is consistent with the argument in our manuscript that hospital-level engagement is needed to improve nurses' mental health and, ultimately, patient safety outcomes. Therefore, we emphasized this relevance and have described the job demands-resources model to Introduction and Discussion parts.

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