

# Prediction of hallucination proneness based mindfulness

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With regard to the hypotheses, our investigation demonstrates that there was considerable association between all variables (mental distress and mindfulness) and hallucination proneness, also this study shows that mindfulness can predict proneness of hallucination by mediating of mental distress.

The results are supported by some of previous researches, at the first it's going to mention to researches that shows the mental distress role in proneness of hallucination. For example: Paulik and colleagues findings showed that, hallucination is associated to mental distress(Waters, Badcock, & Maybery, 2003),(Paulik, Badcock, & Maybery, 2006). In another investigation: A one-year longitudinal study Simon, Ludwig, Gruber et al. found an association between depression and subclinical hallucination in adolescents' outpatients(Simon et al., 2009). In another study Hartley, Haddock, Barrowclough fund out (2012): Anxiety and depression have an association with hallucination distress (Hartley et al., 2012).

Beside, Devylder and Matthew illustrated: Stress sensitivity can result to auditory hallucination(DeVylder & Hilimire, 2015). And furthermore, the results that obtained in this investigation are similar to Badock and Hugdahl observations which is demonstrate that stressful condition can be results to Auditory- verbal hallucination(AVH)(Badcock & Hugdahl, 2012). Besides, Radcliffe and ilkinson described that how anxiety can increase hallucinations through thought content(Ratcliffe & Wilkinson, 2016). Correspondingly, there are studies that confirms the finding of this investigation about the role of mindfulness in reduction of hallucination proneness that in the following

referred to some of them in brief: Gomez, Leon, Escadero et al, (2015) showed that mindfulness has indirect effect on hallucination and stress(Úbeda-Gómez et al., 2015). In the other investigation Bajaj, Robins and Pande study showed mindfulness has indirect effect on anxiety and depression by mediation of self-esteem. In like manner, this results support our findings. Branhofer, Duggan and Griffith suggest that mindfulness can decrease depression(Barnhofer et al., 2011). These investigations somehow are corresponding to our model (finding).

Despite the research mentioned above, there is a research that don't support the results of this study. Gawęda, Holas and Kokoszka suggested that there is not any mediating role between anxiety and depression and auditory hallucination dimensions (Gawęda, Holas, & Kokoszka, 2013). This disagreement may have been because of the difference between measures and scales that they utilized.

One of most important finding of this study is distinguishing the mediator roles of mental distress in predicting the proneness of hallucination. Which means, individuals who are more mindful and have lower levels of mental distress, remarkably, experience less hallucination. An acceptable explanation for this phenomenon can be that: mindful peoples live in moment so there is a significant reduction in the amount of stress caused by thinking about future in this persons(Evans & Segerstrom, 2011). Moreover, peoples who have the skill to being mindful, experience a happier life because they pursue a mindful states in facing with persistent ups and downs of life so they feeling less suffer, as well as they experience less anger

and sadness which leads to less mental distress(Hofmann & Gómez, 2017). Since the hallucinations suggested that occur because of deficits in metacognitive skills such as reality monitoring(Bentall, 1990). It seems mindful peoples have more metacognitive skills, so they experience less hallucination in comparison with the rest of individuals(Reed, Carey, Evans, & Rutter, 2016). Beside, mindful individuals are having this endowment to enjoy more self-regulation, awareness, and acceptance that may be important in reduction of hallucinations experiences(Olson & Emery, 2015). Also Mindfulness is an awareness that is emerged through paying attention on purpose, in the present moment, in a nonjudgmental way(Kabat-Zinn, 2003). In other hand, seems mindful individuals who experienced less hallucinations proneness were less focused on their own thoughts, memories and images than persons with high hallucinations proneness (Perona-Garcelán et al., 2014).

In order to explaining the cause of mental distress mediation role in hallucination, can argued that: more severe anxiety induces the risk of depressive symptoms (Bauer et al., 2011);(Lysaker & Salyers, 2007). The possible cause of this situation may be the comorbidity of anxiety and depression(Chiang et al., 2018). As well as Emotions malregulation and thought and cognitive imitations are the main causes of anxiety. Also anxiety can change the individual's perceptions about reality that is called "distorted reality ". Anxiety develop verbal hallucinations (VHs), One of main cause of VHs emerged from a particular anxious style of anticipation; This anxious anticipation results an experience of thinking more like one of

perceiving(Ratcliffe & Wilkinson, 2016). Also Peoples who suffer from distress experiences lose their connections with present moment that result depersonalization, decreolization and etc. while peoples with high levels of mindfulness are connected to the present moment and the here and now, and are also aware of their environment(Escudero-Pérez et al., 2016). Another one reason of distorted reality is changing in the level of neurotransmitters that interfere in the mechanism of Fight-or-Flight Response. Alternatively, it is possible that anxiety or stress can be involved in generating hallucination through such a same mechanism that produce distorted reality.

In the modern psychology and psychiatry, evermore there was the discourses about association between depressive disorder and hallucination and other psychotic disorders. Recently, it is found evidences which confirms this claim that depression and hallucinations are related in normal population. For instance: another investigations demonstrate that depression and sleep disorders are an important risk factor for mentally and physiologic fatigue that results hallucination(Ikeda, Kataoka, & Ueno, 2016).

Furthermore, as there are Silent Right Frontal Lobe Infarctions in elderly patients who suffering hallucinations , depressive patients and also psychotic patients, based on the continuum models of psychosis which argue that hallucination-proneness is distributed in clinical and non-clinical groups, it is likely that such brain defects in non-clinical depression bring about hallucination(Badrin, Mohamad, Yunus, & Zulkifli, 2017);(Garrison et al., 2017).

Moreover, since glutamate is a neurotransmitter that have a role in depression symptoms and as well as auditory hallucination in psychotic patients according to continuum models of psychosis, there is a possibility for a correlation between depression and hallucination through mediating role of glutamate(Alcaro, Panksepp, Witczak, Hayes, & Northoff, 2010); (Hugdahl et al., 2015). Thus, according to the findings of this investigation is not impossible that non-clinical levels of depression can generate some hallucination in non-clinical peoples. And also mindful peoples experience less depression and anxiety, furthermore mindfulness based intervention can reduce depression and anxiety in non-clinical individuals who are less mindful (Curtiss & Klemanski, 2014).

In conclusion, the present study demonstrate the predictive role of mindfulness as personality feature through mediating of mental distress (anxiety, depression and stress) in proneness of hallucinations. The results shows the prevalence of hallucination in more mindful individuals are less than the other non-clinical peoples.

**Limitations:**

Despite the findings highlighted and mentioned above, there are a few limitations of this study, the most important limitation of this study is the relative smallness of the sample size. But beyond this limitation, there were some other limitations in the study: First, this study was cross-sectional and findings do not prove causation. Second, the findings are based on self-report and therefore there is the possibility of reporting biases. It is essential to emphasizing that there is doubts that whether researchers can achieve to

aspects of mindfulness by self-report(Barnhofer et al., 2011). and as the final limitation, it should mentioned that data were collected from college students residing in an urban city in Iran, Tehran. Considering the role of cultural and religious factors, the model should be examined using in different country and cultures, including collectivist and individualist societies.