

Improving mindful attention awareness among Saudi nursing students through autonomous sensory meridian response stimulation

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Abstract

Context: Increase mindfulness can help the students in dealing and successfully finishing their studies. Therefore, it is warranted to know if autonomous sensory meridian response (ASMR) has an effect in the mindfulness of the nursing students.

Aims: This study aimed to assess the immediate effects of ASMR stimulation on the mindful attention awareness of nursing students.

Settings and Design: This is a quasi-experimental pre- and post-test design with two experimental groups (whispering and auditory triggers) and a comparison group (personal attention role play trigger).

Materials and Methods: Fifty-four nursing students from the college of applied medical sciences were assigned into three groups: (a) the whispering group ($n = 18$), (b) the auditory group ($n = 18$), and (c) the personal attention group ($n = 18$). An adapted Mindful Attention Awareness Scale (MAAS) was used to assess the mindful attention awareness of nursing students.

Statistical Analysis Used: Paired *t*-tests and ANOVA were employed to identify significant differences between pre- and post-test scores for each group.

Results: Both MAAS posttest scores of the whispering sound ($d = 0.49$) and auditory sound ($d = 0.48$) acquired a significant Cohen's effect size value when compared to the personal attention triggers, suggesting a high practical significance. However, when the two experimental groups were compared, the effect size value was not significant ($d = -0.02$), established an equal effect on the mindful attention awareness of nursing students.

Conclusion: ASMR is considered a promising intervention in the nursing education to improve students' mindful attention awareness. Specifically, the whispering and auditory sounds are better than the personal attention trigger sounds in increasing the mindfulness attention awareness scores of the nursing students.

Keywords: Cognitive behavior therapy, Health care, Quasi-experiment, Sound, Stimulation

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INTRODUCTION

Mindfulness is a two-component model: self-regulation of attention and orientation to experience.^[1] Self-regulation of attention involves sustained attention, attention, switching, and inhibition of elaborative processing. Orientation is nonelaborative awareness to current experience and relating to one's experience within an orientation of curiosity, experiential openness, and acceptance.

Mindfulness has been a subject of interest because of its benefits. It was found to have a good influence on academic performance.^[2] Students who use mindfulness are more focused and prepared, strategize for future, reach higher examinations scores, and contemplate critically. It also increases positive mood states, self-efficacy, and empathy in health profession students.^[3]

Mindfulness and autonomous sensory meridian response (ASMR) share some phenomenological characteristics.^[4] ASMR is a combination of positive feelings, relaxation, and a distinct static-like tingling sensation on the skin. Smith *et al.* found out that sensitivity to two trigger categories is positively correlated with the dorsal attention network.^[5] This suggests that ASMR may involve attentional processing.

Harrison and Clark also suggested that there is a relationship between mindfulness and atypical perceptual experiences such as ASMR. As noted, attention is central to both mindfulness and ASMR.^[6]

Some studies found out that people who experience^[7] and who have the tendency to experience ASMR^[8] score higher in Observe facet of the five facet mindfulness questionnaire (FFMQ). Using Toronto Mindfulness Scale (TMS) and Mindful Attention Awareness Scale (MAAS), Fredborg *et al.* noted the same findings.^[9] On the other hand, Janik McErlean and Osborne-Ford found out that ASMR is not related to the constructs of flow and mindfulness.^[10]

Based on the reviewed studies and inconsistent findings, the relationship between the two constructs is not yet established. Building on the concept that mindfulness and ASMR have same characteristics and its importance among students, the present study used ASMR stimulation as intervention to improve the mindfulness of the students. This helped elucidate further the relationship between the two constructs. Using MAAS, the present study explored the possibility of improving the mindfulness of Saudi students using ASMR stimulation.

Background of the study

Mindfulness has different definitions depending on their application whether as a state, a trait, or a practice.^[11] As a state or process, mindfulness is a manner of engaging with one's internal and external experience.^[7] As a trait, it is paying attention in the present moment nonjudgmentally.^[12] As a practice, it is a form of meditation.

Bishop proposed a two-component model of mindfulness: self-regulation of attention and orientation to experience.^[1] Self-regulation of attention involves sustained attention, attention, switching, and inhibition of elaborative processing. Orientation is nonelaborative awareness to current experience and relating to one's experience within an orientation of curiosity, experiential openness, and acceptance.

Mindfulness has been a subject of interest because of its suppose benefits. It was found to have an optimistic influence on academic performance.^[2] Students who use mindfulness are more focused and prepared, strategize for future, achieve higher score in examinations and tests, and contemplate critically. It also increases positive mood states, self-efficacy, mindfulness, and empathy in health profession students.^[3] It helps those who have emotionally taxing career to maintain a healthy emotional outlook.

With the increase interest in mindfulness, some measures were developed including MAAS, FFMQ-15, and TMS. MAAS is a 15-item scale designed to assess the characteristics of mindfulness which is open or receptive awareness and attention to what is happening in the present.^[13] FFMQ-15 includes five facets of mindfulness: observing, describing, acting with awareness, nonjudging of inner experience, and nonreactivity to inner experience.^[8] While TMS consists of 13 items with two subscales including curiosity subscale and decentering subscale.^[9]

Mindfulness and ASMR share some phenomenological characteristics.^[4] ASMR is a combination of positive feelings, relaxation, and a distinct static-like tingling sensation on the skin. It is triggered by viewing others engaged in focused precise task, by having close personal attention, or by any number of audio stimuli.^[4]

Smith *et al.* examined the functional connectivity associated with individual differences, in which stimuli elicit ASMR and the intensity of the responses using a resting state functional magnetic resonance imaging. It was found out that sensitivity to two trigger categories is positively correlated with the dorsal attention network.^[5] This suggests that ASMR may involve attentional processing.

Harrison and Clark also suggested that there could be a relationship between mindfulness and atypical perceptual experiences such as ASMR.^[6] As noted, attention is central to both mindfulness and ASMR.

Del Campo and Kehle also suggested that mindfulness could be the element underlying the phenomena of ASMR.^[7] Barratt and Davis speculated that the positive effect of ASMR could be due to engagement with ASMR material being a form of mindfulness.^[4] In relation, Tihanyi also remarked that ASMR might enhance mindfulness by strengthening the present moment bodily awareness.^[14]

Del Campo explored how trait mindfulness and its facets might have been related to the self-reported experience of ASMR. It was found that individuals who experience ASMR have higher trait levels in the observe facet of FFMQ.^[15] Observing subscale is the quality of noticing or attending experience.^[16] Higher scores were reported by those who had ASMR experience. The other facets and the total score of FFMQ, however, are not significantly related to ASMR.

Similarly, using a FFMQ-15, scofield explored the relationship between ASMR, misophonia, and mindfulness. Results showed that a strong tendency to experience ASMR is significantly correlated to higher level of mindfulness but only in observing subscale.^[8] However, it was also determined that this correlation is weak as compared to what was being hypothesized.

Using TMS and MAAS, Fredborg *et al.* also examined how state and trait mindfulness might relate to ASMR. The study showed that individuals with ASMR has significantly higher scores on MAAS and Curiosity scale of TMS compared with matched controls.^[9] It suggests that individuals who are curious about the stimuli will experience more intense ASMR than those who are less curious. It suggests a cognitive active process. Touching and repetitive sounds are significantly correlated with curiosity as well. Listening and watching people touching things may require a mental picture of the perceived stimuli. These support the idea that ASMR is related to mindfulness.

However, a study done by Janik McErlean and Osborne-Ford found out that ASMR is not related to the constructs of flow and mindfulness. The total immersion in the experience with loss of self-awareness (core features of absorption), rather than sustained consciousness of the current moment (characteristic of mindfulness) is found to be the feature relevant to the ASMR experience.^[10] This finding is inconsistent with the findings of Fredborg *et al.*,^[9]

though both studies used the same measure and participant recruitment strategy.

Based on the reviewed studies and inconsistent findings, the relationship between the two constructs is not established. Building on the concept that mindfulness and ASMR have same characteristics and its importance among students, the present study used ASMR stimulation as intervention to improve the mindfulness of the students. This helped elucidate further the relationship between the two constructs. Using MAAS, the present study explored the possibility of improving the mindfulness of Saudi nursing students using ASMR stimulation.

Aim

This study aimed to measure the immediate effects of ASMR stimulation on the mindful attention awareness of nursing students. Specifically, the results in this study sought to address these hypotheses:

- H₁: There will be a significant improvement in the mindful attention awareness of nursing students for those who participated in the ASMR stimulation
- H₂: There will be a significant difference among the effects of whispering, auditory, and personal attention role play triggers on the mindful attention awareness of nursing students.

MATERIALS AND METHODS

Study design and participants

The design of this paper is a quasi-experimental pre- and post-test design with two experimental groups (whispering and auditory triggers) and a comparison group (personal attention role play trigger). The study was conducted at the College of Applied Medical Sciences, Majmaah University, which is a government university in Saudi Arabia. The utilized Software details: (g-power.apponic.com) in Mac OS to determine its sample for its effect size (medium = 0.5) and priori power analysis (80% under 0.5 significance) of the intervention. IBM Middle East FZ-L.L.C, Riyadh, Kingdom of Saudi Arabia.

This is a single-blind study where 54 nursing students were recruited through purposive sampling, which were dispersed into the three groups (no sample drop): (a) the whispering group ($n = 18$), (b) the auditory group ($n = 18$), and (c) the personal attention group ($n = 18$). It includes the following: (a) 18–25 years old, (b) able to speak and understand English, and (c) currently studying in baccalaureate nursing program.

To start the intervention for each group, the following conditions should be met: (a) students from each group should meet the aforementioned eligibility criteria, (b) no history of any conditions that might cause hearing impairment such as but not limited to partial hearing loss, (c) no current manifestations of hearing impairment upon assessment, and (d) no reported sleep disturbances such as narcolepsy or insomnia. Conversely, to conclude the intervention for each group, the following expectations should be met: (a) no manifestations of hearing impairment upon re-assessment, and (b) no reported signs and symptoms of dizziness and lethargy.

Interventions

Similarly, intervention was developed and pilot tested. Specifically, it employed an ASMR recorded videos designed for experimental groups and actual vocal expression for the comparison group. The ASMR videos were downloaded from YouTube with permission from the content creators. Participants arrived at the area by group, and each group watched the ASMR stimulus for about 20 min. Each group exposed to whispering, auditory, and personal attention triggers for only once. Then, the effects of the ASMR stimulation on the mindful attention awareness were measured instantaneously using a reliable and valid instrument after the students watched to their given intervention.

Instruments

Participants were compulsory to convey a sociodemographic and medical background, including demographics. Checklist was provided to identify the following diseases regarding partial hearing loss and sleep disturbances.

Furthermore, the study adapted the MAAS,^[13] Standard Version, to assess the mindful attention awareness of nursing students. It is intended to measure an essential distinction of mindfulness, namely, a receptive state of mind in which attention, informed by a sensitive awareness of what is occurring in the present and simply observes what is taking place. The MAAS is composed of 15 items formulated in an indirect way (e.g., “I rush through activities without being really attentive to them”) that address cognitive, emotional, physical, interpersonal, and general domains. Students must rate the statements on a 6-point Likert scale ranging from 1 (*almost always*) to 6 (*almost never*). High scores reflect more present-moment awareness state. This instrument was used to assess the immediate effect of ASMR to the mindfulness state of the students which can help them to make more rational decisions by considering the information available in the present moment. The MAAS is a valid and reliable measure

of mindfulness among the study subjects. Specifically, the MAAS showed excellent internal consistency ($\alpha = 0.90$), and all items showed adequate corrected item-total correlations.

Data collection

Pilot testing was conducted in one of the nursing programs in Saudi Arabia with a total of 54 nursing students. Similarly, on the similar context, the actual collection of data was performed for about 2 months (April–May 2019).

The debriefing room for nursing skill simulations which is a 4 × 4 well-ventilated room is used to conduct this study. Over two consecutive Mondays, interventions were made as single session for each group and this excludes those who were involved in pilot testing. Definitely, there were two distinct meetings on the first Monday: the morning group was allocated to the personal attention comparison group ($n = 18$), while the afternoon group was assigned to the whispering experimental group ($n = 18$). Consequently, another Monday group was allocated to the auditory experimental group ($n = 18$). The entire participants were visionless to whether they are designated to the control group or experimental group for the reduction of committing bias. Generally, the control and experimental groups acquired pretesting for mindful attention awareness ability and contact to the designated intervention, and members also acquired a posttest of their mindful attention awareness ability directly after their involvement.

Ethical considerations

An ethics approval was secured to the Institutional Review Board of Majmaah University well as consent of the office of vice deanship for research under the agreement with the Helsinki Declaration of 1995. An informed consent was done and secured to the study participants to ensure their privacy, confidentiality, and anonymity. Voluntary participation will be ensured and clearly stated in informed consent. Subjects will be advised that they may wholly or partially withdraw any time during the study conduct. Since the study involves only collection of information, there are no anticipated risks for involvement.

Data analyses

Demographics of the participants were presented through descriptive statistics. Pre- and post-test scores in the MAAS among the three groups were presented using mean and standard deviation (SD). Paired *t*-tests and ANOVA were employed to identify the significant differences between the pre- and post-test scores for each group since we only compare the levels of the three sounds (whispering, auditory, and personal attention trigger) for mean differences on a

single continuous response variable – MAAS, while Tukey's test was computed for its *post hoc* analysis. All these were analyzed using IBM SPSS Statistics Mac OS X, Version 5.3. Software details: IBM Middle East FZ-L.L.C, Riyadh, Kingdom of Saudi Arabia.

RESULTS

Participant characteristics

Fifty-four nursing students were involved in the study. They were equally distributed to the three groups. The mean age of the nursing students was 19.56 ± 7.21 , 19.16 ± 7.55 , and 20 ± 6.64 in the whispering, auditory, and personal attention triggers, congruently. Furthermore, majority were female in the whispering (72%), auditory (61%), and personal attention triggers (56%) groups. Age and sex in the three groups were found to have no significant differences in the intervention ($P > 0.05$; Table 1).

Effects of autonomous sensory meridian response on the mindfulness attention awareness of nursing students

In Table 2, the results of paired *t*-tests revealed that student participants who were exposed to whispering sounds obtained significantly higher MAAS posttest scores (mean = 27.24, SD = 2.46) than their pretest scores (mean = 25.02, SD = 3.98), $t_{(44)} = -3.90$, $P = 0.001$, 95% confidence interval (CI) (-3.37, -1.08) with a Cohen's effect size value ($d = 0.67$) that implies a high practical significance. Furthermore, those who exposed to auditory sounds attained significantly higher MAAS posttest scores (mean = 27.28, SD = 2.75) than their pre-test scores (mean = 24.29, SD = 5.16), $t_{(44)} = -4.49$, $P = 0.001$, 95% CI (-5.06, -1.92), which also has a high practical significance ($d = 0.84$). However, the participants who were exposed to the personal attention

triggers did not attain significantly higher MAAS posttest scores (mean = 25.64, SD = 3.91) than their pretest scores (mean = 25.24, SD = 4.48), $t_{(44)} = -0.68$, $P = 0.001$, 95% CI (-1.59, 0.79). The Ethical code of article is IRB 19-123E Majmaah University.

The results of the Tukey's test in Table 3 reveal that both the MAAS posttest scores of the whispering sound ($d = 0.49$) and auditory sound ($d = 0.48$) acquired a significant Cohen's effect size value when compared to the personal attention triggers, suggesting a high practical significance. However, when the two experimental groups were compared, the effect size value was not significant ($d = -0.02$), establishes an equal effect on the mindful attention awareness of nursing students.

DISCUSSION

This study aimed to assess the effects of ASMR stimulation on the mindfulness of nursing students. Based on the findings, ASMR seems to be effective in enhancing the mindfulness of the students. The findings also suggest that there is no significant difference between the effects of whispering and auditory triggers.

Based on the current study, both the age and sex of the participants have no significant differences. This could be due to the fact that the participants are of the same age group and the gender distribution of the participants is almost the same.

The experimental group has significantly higher MAAS posttest scores than the comparison group. These mean that the ASMR videos downloaded from YouTube are effective in increasing MAAS scores supporting the idea that ASMR can improve mindfulness. This finding is similar to a study done by Fredborg *et al.*^[9] where the participants scored significant high in MAAS. This supports the idea that ASMR is related to mindfulness. On the other hand, Janik McErlean and Osborne-Ford^[10] results found no relationship between the two constructs.

However, it should be taken in consideration that the present study did not only include participants who have ASMR ability as with the study done by

Table 1: Characteristics of nursing students across three groups

Demographic	Whispering	Auditory	Personal attention triggers	P
Age (y), mean (\pm SD)	19.56 (\pm 7.21)	19.16 (\pm 7.55)	20 (\pm 6.64)	0.56 ^a
Sex				
Male, n (%)	5 (28)	7 (39)	8 (44)	0.63 ^b
Female, n (%)	13 (72)	11 (61)	10 (56)	

^aANOVA, ^b χ^2 test

Table 2: Mean scores of mindfulness attention awareness of nursing students in the three groups

Group	MAAS mean score (\pm SD)		
	Pretest (before the intervention)	Posttest (immediately after the intervention)	SMD (95% CI)
Whispering (n=18)	25.02 (\pm 3.98)	27.24 (\pm 2.46)	0.67 (0.25-1.09)**
Auditory (n=18)	24.29 (\pm 5.16)	27.28 (\pm 2.75)	0.84 (0.41-1.27)**
Personal attention triggers (n=18)	25.24 (\pm 4.48)	25.64 (\pm 3.91)	0.09 (-0.32-0.51)

MAAS, mindful attention awareness scale; SMD, standardized mean difference; CI, confidence interval. **Statistically significant at $P < 0.001$

Table 3: Comparisons of the mindful attention awareness scores between groups in post interventions

Group	MAAS posttest SMD (95% CI)
Whispering vs. Auditory	-0.02 (-0.43-0.38)
Whispering vs. Personal attention triggers	0.49 (0.07-0.91)*
Auditory vs. Personal attention triggers	0.48 (0.07-0.90)*

MAAS, mindful attention awareness scale; SMD, standardized mean difference; CI, confidence interval. *Statistically significant at $p < 0.05$

Fredborg *et al.*^[9] Another study which included participants who have the tendency to experience ASMR also scored high in mindfulness.^[8] The study used FFMQ to measure mindfulness.

ASMR may be explained by expectations which are the placebo effect. For participants who are non-ASMR individuals, they reported tingling sensation when hearing video clips with leading instructions, while ASMR individuals only reported tingling sensations when hearing audio clips intended for ASMR.^[17] This means that if all the participants would have been ASMR individuals, there is a possibility that the posttest scores would have been higher than the current result.

On the other hand, the current study found that there is no significant difference between the effects of whispering and auditory. The two interventions, whispering and auditory, are the same in nature, while personal trigger is visual in nature. Visual triggers are found to be less significant in triggering ASMR than auditory triggers.^[4] This could be the reason why the posttest scores of the two triggers are almost the same establishing an equal effect on mindful awareness of nursing students. In contrast, a study showed an enhanced activity in the visual and auditory cortices with minimal variability in their ratings.^[5,18]

The current study supports the idea that ASMR is related to mindfulness and the use of ASMR videos can enhance mindfulness of students. Those students who experience ASMR got a high score in MAAS, which is a measure of the component of attention toward mindfulness.^[9] Subsequently, this can enhance their mental processes, which could lead to successful learning. In the academic preparation of nursing students, mindfulness seems to be important. Studies suggest that mindfulness creates an optimistic influence on academic performance.^[2] Nursing students who use mindfulness are expected to be more focused and prepared, strategize for future, achieve higher in examinations and tests, and contemplate critically. It helps those who have stressful careers to maintain a healthy outlook.

Colleges of nursing that have ongoing mindfulness training or are planning to incorporate this training to their programs may want to explore the ASMR stimulation techniques for their students. Literature suggests that increased mindfulness may influence the transpersonal caring abilities,^[19] improve student's clinical decision-making skills,^[20] and their caring nurse–patient interaction skills.^[21]

This study has certain limitations that affect the generalizability of the findings. First, the cohort is a representative of only one nursing program in Saudi Arabia. Another limitation is that the ASMR audio materials are only taken from none-copyrighted downloadable YouTube videos. There is no ASMR technical expert and no verification on the correct classification of each sound has been made. The entire preparation of the materials is carried out by the team, and classification is based on the literature and video materials available. Moreover, this study is only confined on the MAAS tool in determining the mindfulness state of the participants. Similarly, the qualitative aspect of the participants' mindfulness experience has not been elicited. Hence, this suggests that more research needs to be conducted to explore the improvement of mindfulness using ASMR stimulation.

CONCLUSION

ASMR is effective in improving the mindfulness state of the students. However, when whispering sounds and auditory sounds are compared in increasing mindfulness attention awareness, both are equally superior to the personal attention trigger sounds. Thus, it is recommended that students adopt this innovative approach to improve their mental concentration and attention to information while studying or preparing for assessment tasks. It is also hoped that this approach can help the students to focus on details while performing nursing clinical tasks such as medication administration or nursing documentation. Although the findings give us an idea on the relatedness of ASMR and mindfulness, a much longer period of intervention is recommended to assess the effects of ASMR to the mindfulness state of students.

Conflicts of interest

There are no conflicts of interest.

Authors' contributions

J.D.M., M.A.R., C.J.S.O., and A.S.A. conceived and planned the experiment. J.D.M. and A.S.A. carried out the experiments. J.D.M., M.A.R., and C.J.S.O. contributed to sample preparation. C.J.S.O. performed the calculations. J.D.M. and M.A.R. contributed to the interpretation of the

results. J.D.M. took the lead in writing the manuscript. All authors provided critical feedback and helped shape the research, analysis and manuscript.

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