Physiological Relaxation Induced By ASMR: A Galvanic Skin Response Study Across Audio and Audiovisual Modalities

S.M. Khan, Shadaan Afreen, Fiza Khan

Department of Psychology, Aligarh Muslim University, Aligarh, India

***Corresponding Author**

DOI: https://doi.org/10.51244/IJRSI.2026.1304000073

Received: 05 April 2026; Accepted: 10 April 2026; Published: 30 April 2026

ABSTRACT

Autonomous Sensory Meridian Response (ASMR) is a perceptual phenomenon marked by tingling sensations that typically begin in the scalp or neck and are accompanied by a sense of calm and relaxation. Although ASMR content is widely used to reduce stress and anxiety, empirical research on its physiological effects remains limited. The present study examined the impact of ASMR exposure on electrodermal activity, measured through skin resistance, across two sensory conditions: audio-only and audiovisual. Sixty students were randomly assigned to either condition and exposed to ASMR stimuli for 15 minutes. Galvanic Skin Response (GSR) was recorded at baseline and at five-minute intervals. Results showed a significant increase in skin resistance over time in both groups, indicating a decrease in sympathetic arousal and a shift toward a more relaxed physiological state. The pattern of change was comparable across conditions, with no significant differences observed between the audio-only and audiovisual groups. These findings suggest that ASMR, regardless of modality, can produce measurable physiological relaxation. The results support its potential as a simple, accessible, and non-invasive tool for stress reduction, particularly in student populations.

Keywords: ASMR, GSR, relaxation, electrodermal activity, skin resistance, modality, physiological regulation

INTRODUCTION

Autonomous Sensory Meridian Response (ASMR) is a perceptual phenomenon described as a tingling sensation that typically begins on the scalp and moves down the back of the neck and upper spine (Barratt & Davis, 2015). These sensations are often accompanied by a sense of calm, relaxation, and emotional relief. ASMR is generally triggered by specific audiovisual cues such as soft-spoken speech, slow-paced hand movements, tapping, or personal attention roleplay (Poerio et al., 2018).

Although ASMR content has grown rapidly in popularity through platforms like YouTube, with many individuals using it to manage stress, anxiety, or insomnia, research into its physiological mechanisms and therapeutic value remains limited and scattered. Initial investigations into ASMR relied primarily on qualitative reports and self-reported experiences. While these studies helped establish the emotional impact and commonality of ASMR (Barratt & Davis, 2015; Fredborg et al., 2017), they provided limited insight into the underlying biological mechanisms.

In recent years, researchers have begun using psychophysiological methods such as electrodermal activity, heart rate variability, and neuroimaging to examine how the body responds to ASMR in real time (Smith et al., 2019; Lochte et al., 2018). Among these, electrodermal activity (EDA), measured through Galvanic Skin Response (GSR), has emerged as a reliable indicator of autonomic nervous system (ANS) activity during emotionally or sensory-induced states (Boucsein, 2012).

The autonomic nervous system regulates involuntary physiological functions and consists of two primary branches: the sympathetic and parasympathetic systems. The sympathetic branch is associated with arousal and alertness, while the parasympathetic branch supports relaxation and recovery (Dawson et al., 2017). Skin conductance (or skin resistance) is a well-established indicator of sympathetic nervous system activity. An increase in skin resistance reflects a decrease in sympathetic arousal, indicating a shift toward parasympathetic dominance (Boucsein, 2012; Critchley, 2002).

Recent studies provide preliminary evidence that ASMR may influence autonomic responses. Poerio et al. (2018) found that individuals who experienced tingling sensations during ASMR exposure showed reduced heart rate alongside changes in skin conductance, suggesting a calming physiological effect following an initial sensory response. Similarly, Smith et al. (2019) proposed a two-phase model involving a brief period of arousal followed by a longer phase of parasympathetic recovery. These findings support the idea that ASMR may produce both immediate sensory activation and sustained relaxation.

Despite these findings, results across studies remain mixed, and several methodological gaps persist. One key limitation is the lack of clarity regarding the role of individual sensory modalities. Most experimental studies employ audiovisual stimuli, combining auditory triggers such as whispering or tapping with visual elements like slow movements or facial gestures. While this reflects typical ASMR consumption, it makes it difficult to determine the relative contribution of auditory and visual components.

Only a limited number of studies have attempted to isolate these modalities, often with constraints related to experimental control or stimulus consistency (Lee et al., 2021). Understanding modality-specific effects is important for identifying which components of ASMR are most effective in eliciting physiological relaxation. Such insights can also inform the development of more targeted and accessible interventions tailored to individual preferences and contexts.

Additionally, there is a relative lack of empirical research examining ASMR responses in non-Western populations. Given the increasing global use of ASMR for stress management, it is important to investigate its physiological effects across diverse cultural contexts.

In light of these gaps, the present study aims to examine the physiological effects of ASMR across two sensory modalities: audio-only and audiovisual. Electrodermal activity, measured through Galvanic Skin Response (GSR), is used as an objective indicator of autonomic nervous system activity. Skin resistance values were recorded at 5, 10, and 15 minutes to track changes over time. Self-reported experiences of tingling and relaxation were also collected to provide a more comprehensive understanding of the ASMR response.

This study does not aim to evaluate ASMR as a clinical intervention but focuses on its physiological correlates within a controlled setting. By adopting a modality-specific design, it seeks to contribute to the growing literature on ASMR and enhance understanding of how different sensory formats influence physiological and emotional regulation, particularly within an Indian student sample.

METHOD

Participants

The present study was conducted on a total of 60 university students recruited through convenience sampling. Participants were randomly and equally assigned to two experimental groups of 30 students each. One group was exposed to audio-only ASMR content, while the other group was exposed to audiovisual ASMR content. Participants were primarily young adults enrolled in university programs. Informed consent was obtained prior to participation, and students were briefed about the non-invasive and voluntary nature of the study.

Ethical-Considerations

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. At the time of data collection, a formal Institutional Review Board (IRB) was not established at the university; therefore, the study protocol was reviewed by senior faculty members to ensure minimal risk and ethical compliance. All participants provided written informed consent and were informed of their right to withdraw at any time without any negative consequences. Participant confidentiality was strictly maintained, and no identifying information was collected.

Procedure

The study was conducted in a controlled psychophysiological laboratory setting. Participants were randomly assigned to one of the two experimental conditions and exposed to the corresponding ASMR stimulus. Instructions were kept simple and consistent across groups to ensure uniformity and minimize procedural bias. The experimental session lasted 15 minutes, during which electrodermal activity was recorded continuously. Data were segmented into three time intervals: 5 minutes, 10 minutes, and 15 minutes. Participants were instructed to remain seated and minimize movement to ensure accurate physiological recording.

Apparatus and Stimuli

Electrodermal activity (EDA) was measured using a Galvanic Skin Response (GSR) device configured to record skin resistance. The device was equipped with Ag/AgCl electrodes attached to the index and middle fingers, a method supported by previous research for reliable signal acquisition (Venables & Christie, 1980).

ASMR stimuli were selected from Creative Commons licensed content available on YouTube and reviewed for appropriateness in quality, tone, and duration. The audio-only group received a purely auditory version of the stimulus, while the audiovisual group received the same auditory content accompanied by synchronized visual elements. The stimuli were chosen for their neutral and calming characteristics, consistent with common ASMR triggers such as soft-spoken narration and slow, repetitive movements. Auditory stimuli were delivered through earphones, and audiovisual stimuli were presented in full screen without distractions.

Experimental Design

The study followed a between-groups design with two conditions: audio-only and audiovisual ASMR exposure. Each condition involved a 15-minute session divided into three intervals (0-5, 5-10, and 10-15 minutes). Participants were instructed to relax before the session began and were then exposed to the assigned stimulus.

Skin resistance values recorded at 5, 10, and 15 minutes were used as physiological indicators of relaxation, with increases interpreted as reflecting reduced sympathetic arousal. Data analysis focused on examining changes in electrodermal activity over time and comparing patterns across the two modalities.

RESULTS

The aim of the present study was to examine the effects of ASMR stimuli on skin resistance as a physiological indicator of relaxation and to compare trends across two modalities: audio-only and audiovisual. Skin resistance was recorded at three time intervals (5, 10, and 15 minutes), with higher values interpreted as indicative of reduced sympathetic arousal and increased relaxation. Results are presented separately for each modality, followed by between-group comparisons.

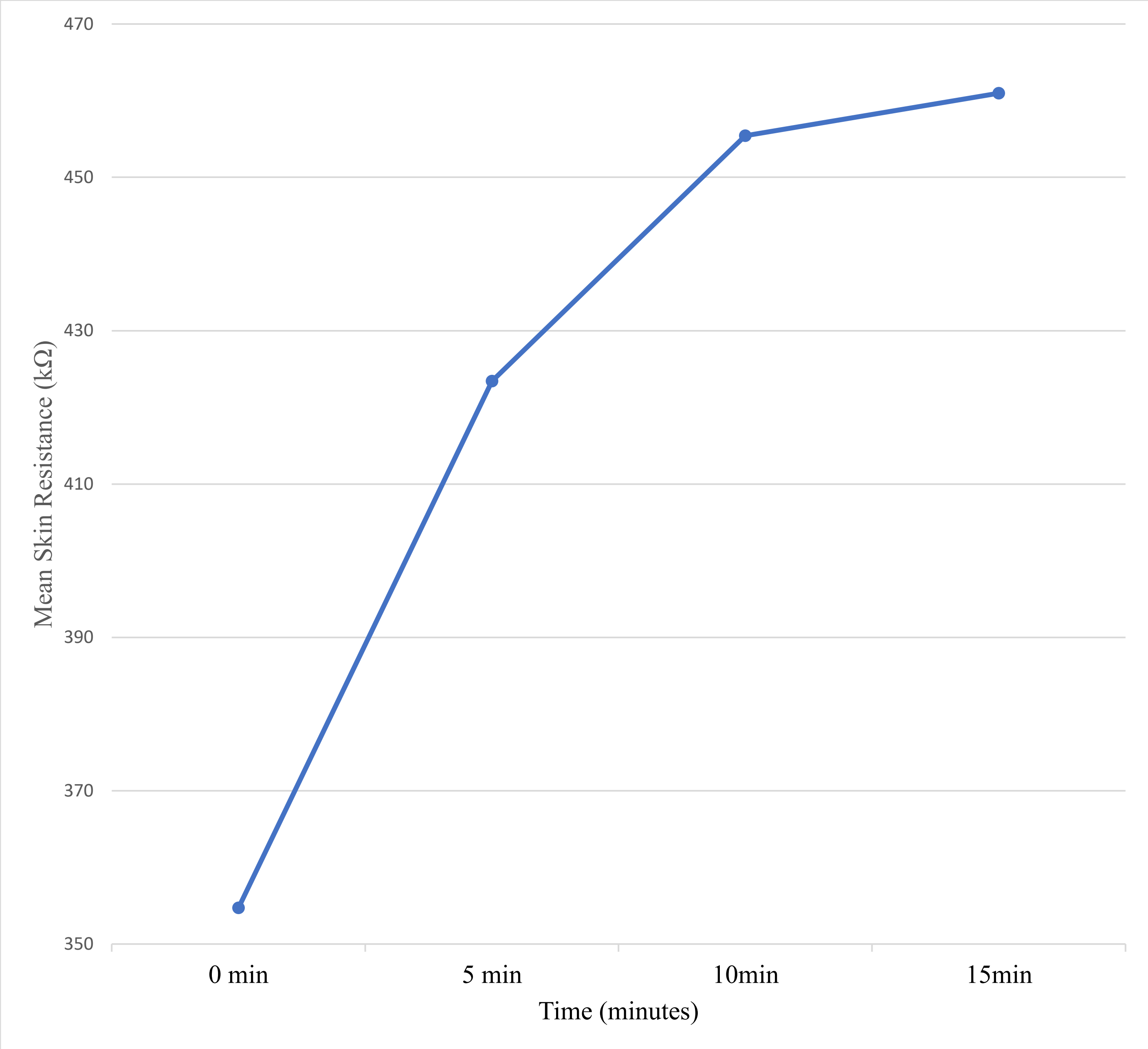
Audio-Only Modality

Mean skin resistance scores (in kilo-ohms) for the audio-only ASMR condition were analyzed across three time points. Descriptive statistics showed a consistent increase in GSR over time. Mean values increased from baseline ($M = 354.70$, $SD = 197.65$) to 5 minutes ($M = 423.43$, $SD = 250.11$), 10 minutes ($M = 455.43$, $SD = 269.84$), and 15 minutes ($M = 460.97$, $SD = 280.93$) (see Figure 1).

A one-way repeated measures ANOVA was conducted to evaluate the effect of time on GSR. Mauchly's test indicated that the assumption of sphericity was violated, $\chi^2(5) = 38.53$, $p < .001$; therefore, Greenhouse-Geisser corrections were applied. A significant main effect of time was observed, $F(1.61, 46.61) = 6.34$, $p = .006$, partial $\eta^2 = .18$, indicating a moderate increase in skin resistance over time. Trend analysis revealed both a significant linear trend, $F(1, 29) = 7.39$, $p = .011$, and a quadratic trend, $F(1, 29) = 4.83$, $p = .036$, suggesting a steeper initial increase followed by a plateau.

Paired-samples t-tests confirmed significant increases in GSR from baseline to 5 minutes, t(29) = −2.83, p = .008; 10 minutes, t(29) = −2.94, p = .006; and 15 minutes, t(29) = −2.73, p = .011. These findings indicate a progressive shift toward physiological relaxation during exposure to audio-only ASMR.

Figure 1 Changes in Mean Skin Resistance (kΩ) Across Time (Audio-Only ASMR Modality)

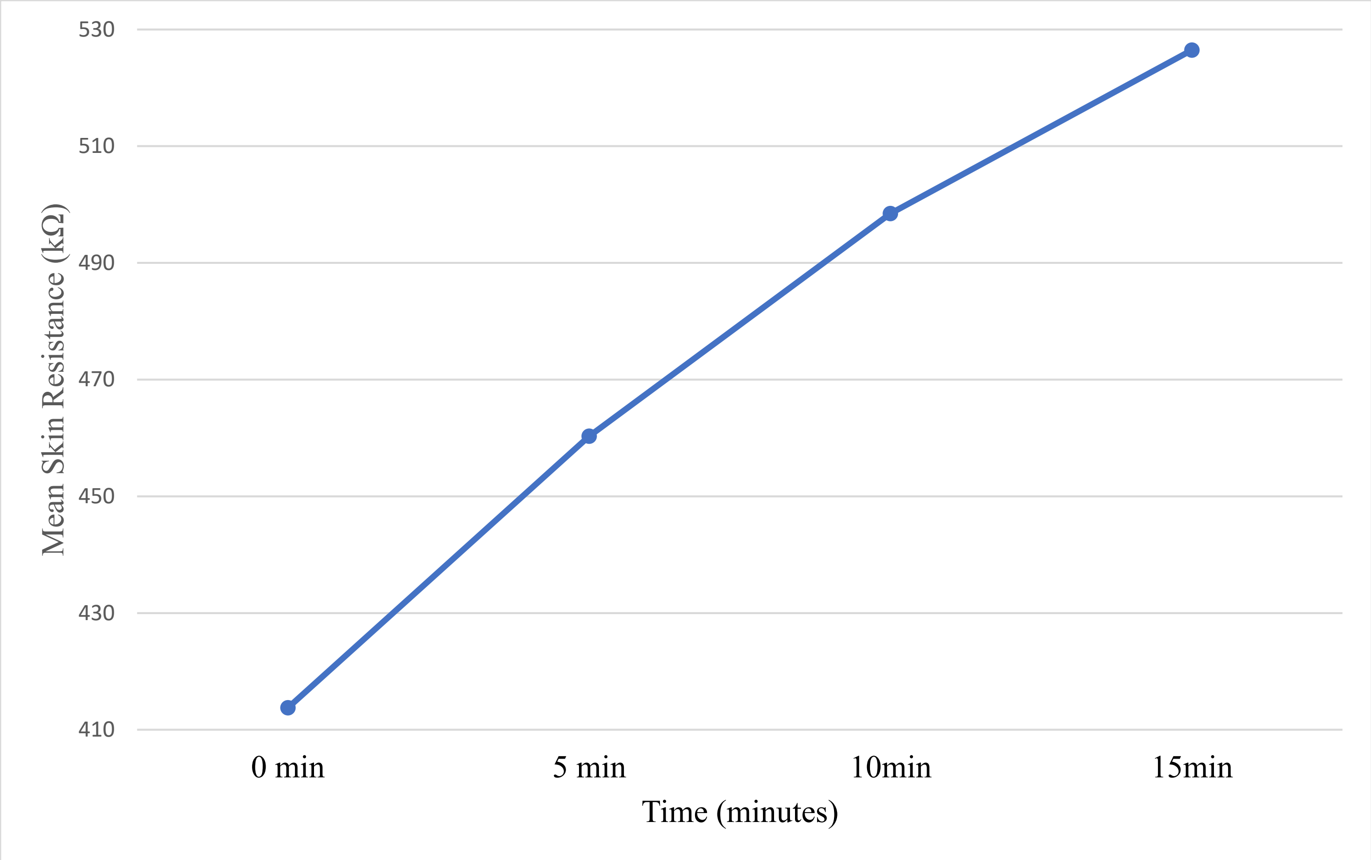


Audiovisual Modality

A similar pattern was observed in the audiovisual condition, with GSR increasing over time. Mean values rose from baseline (M = 413.73, SD = 257.39) to 5 minutes (M = 460.30, SD = 286.07), 10 minutes (M = 498.47, SD = 332.37), and 15 minutes (M = 526.47, SD = 359.18) (see Figure 2).

A repeated measures ANOVA revealed a significant main effect of time, F(1.40, 40.55) = 4.79, p = .025, partial η^2 = .14, indicating a moderate increase in skin resistance across the session. Paired-samples t-tests showed significant increases from baseline to 10 minutes, t(29) = −2.47, p = .020, and from baseline to 15 minutes, t(29) = −2.73, p = .011. The increase from baseline to 5 minutes did not reach statistical significance, t(29) = −1.76, p = .089, although an upward trend was observed. These results suggest a gradual shift toward physiological relaxation in response to audiovisual ASMR.

Figure 2 Changes in Mean Skin Resistance (kΩ) Across Time (Audiovisual ASMR Modality)



Between-Group Comparison

A mixed-design ANOVA was conducted to compare changes in skin resistance across both groups over time. The within-subjects factor was time (baseline, 5 min, 10 min, 15 min), and the between-subjects factor was modality (audio vs. audiovisual). Mauchly's test indicated a violation of sphericity, $\chi^2(5) = 114.21$, $p < .001$; therefore, Greenhouse-Geisser corrections were applied.

The analysis revealed a significant main effect of time, $F(1.40, 80.89) = 12.77$, $p < .001$, partial $\eta^2 = .19$, indicating a moderate increase in GSR across time points in both groups. The main effect of modality was not significant, $F(1, 58) = 0.55$, $p = .463$, suggesting no overall difference between the audio-only and audiovisual conditions. The interaction between time and modality was also not significant, $F(1.40, 80.89) = 0.24$, $p = .702$, indicating a similar pattern of change across both modalities.

Trend analysis showed a significant linear trend, $F(1, 58) = 15.22$, $p < .001$, along with a smaller but significant quadratic trend, $F(1, 58) = 5.27$, $p = .025$, suggesting a pronounced initial increase in skin resistance followed by a leveling off toward the end of the session.

DISCUSSION

The present study examined the physiological effects of ASMR stimuli on relaxation by comparing audio-only and audiovisual modalities, using Galvanic Skin Response (GSR) as an objective index of sympathetic nervous system activity. The primary aim was to determine whether ASMR exposure would lead to measurable increases in skin resistance over time and whether this effect varied across sensory modalities.

Consistent with previous research linking ASMR to relaxation and parasympathetic activation (Poerio et al., 2018; Smith et al., 2019), both conditions produced significant increases in GSR over the 15-minute exposure period. In both groups, skin resistance increased from baseline to the final time point, indicating reduced sympathetic arousal and a shift toward a more relaxed physiological state. These findings support the view that ASMR can reliably induce physiological relaxation.

Within-group analyses showed that the audio-only condition produced significant increases in GSR at each time point compared to baseline, suggesting that auditory triggers alone are sufficient to elicit a sustained relaxation response. The presence of both linear and quadratic trends indicates that the most pronounced changes occurred during the first 10 minutes, followed by a relative plateau. This pattern aligns with earlier suggestions that ASMR may function as a rapid-onset relaxation tool (Fredborg et al., 2017).

In the audiovisual condition, GSR also increased over time, with significant changes observed at 10 and 15 minutes. Although the increase at 5 minutes was not statistically significant, the overall trend was comparable to the audio-only condition. This may suggest a slightly delayed effect of visual input or variability in how participants processed audiovisual stimuli. However, the absence of a statistically stronger effect indicates that visual components do not substantially enhance the physiological response beyond what is achieved through auditory input alone.

The mixed-design ANOVA revealed no significant main effect of modality and no interaction between time and modality. This indicates that both audio-only and audiovisual ASMR produced similar patterns of physiological change over time. This finding is particularly relevant given that the role of modality has often been underexplored or confounded in previous studies (Lee et al., 2021). The results suggest that ASMR-induced relaxation is robust across sensory formats.

A significant quadratic trend across time was also observed, with larger increases in GSR occurring during the first 10 minutes compared to later intervals. This curvilinear pattern suggests that ASMR may be most effective during the initial phase of exposure, with diminishing returns over extended durations. This has practical implications for the use of ASMR in short-duration relaxation or stress management contexts.

The findings of the present study also have applied relevance. Given its accessibility through digital platforms and its non-invasive nature, ASMR may serve as a simple and low-cost tool for promoting relaxation, particularly among student populations. This is especially relevant in academic settings where easily implementable strategies for stress reduction are needed.

Despite these contributions, several limitations should be acknowledged. The sample size, although adequate for the analyses conducted, was relatively small and limited to university students, which may affect generalizability. Additionally, while GSR is a well-established indicator of sympathetic activity, it provides only a partial view of physiological processes. Future studies should incorporate complementary measures such as heart rate variability or respiration to obtain a more comprehensive understanding.

The study also focused on two ASMR modalities without considering other influential factors such as specific trigger types, prior exposure to ASMR, or individual sensitivity. Previous research suggests variability in ASMR responsiveness (Barratt & Davis, 2015), and future work should examine how these individual differences influence physiological outcomes. Furthermore, the study involved a single exposure session, and it remains unclear whether repeated or long-term use of ASMR would produce sustained or cumulative effects.

Additionally, the absence of a formal institutional ethical review at the time of the study may be considered a limitation, although all procedures were conducted in accordance with established ethical guidelines and involved minimal risk to participants.

Finally, the broader cultural context of ASMR remains underexplored. As ASMR continues to gain global popularity, future research should investigate how cultural attitudes and contextual factors shape its experience and effectiveness. Overall, the present study adds to the growing body of ASMR research by demonstrating that both audio-only and audiovisual stimuli can produce measurable physiological relaxation. The absence of a modality-specific effect suggests that even simple auditory formats may be sufficient to reduce physiological arousal. These findings highlight the potential of ASMR as an accessible, non-pharmacological approach to stress reduction and provide a foundation for further research.

CONCLUSION

The present study demonstrates that ASMR, across both audio-only and audiovisual modalities, can produce measurable physiological relaxation, as reflected in increased skin resistance over time. The absence of modality differences suggests that auditory stimuli alone may be sufficient to elicit this effect.

These findings highlight the potential of ASMR as an accessible and non-invasive approach to stress reduction, particularly in student populations. Future research should explore long-term effects, individual differences in responsiveness, and the application of ASMR in broader mental health and wellbeing contexts.

REFERENCES

1. Ayres, A. J. (1972). Sensory integration and learning disorders. Western Psychological Services.
2. Barratt, E. L., & Davis, N. J. (2015). Autonomous Sensory Meridian Response (ASMR): A flow-like mental state. PeerJ, 3, e851. https://doi.org/10.7717/peerj.851
3. Boucsein, W. (2012). Electrodermal activity (2nd ed.). Springer. https://doi.org/10.1007/978-1-4614-1126-0
4. Critchley, H. D. (2002). Electrodermal responses: What happens in the brain. The Neuroscientist, 8(2), 132–142. https://doi.org/10.1177/107385840200800209
5. Dawson, M. E., Schell, A. M., & Filion, D. L. (2017). The electrodermal system. In J. T. Cacioppo, L. G. Tassinary, & G. G. Berntson (Eds.), Handbook of psychophysiology (4th ed., pp. 217–243). Cambridge University Press.
6. Fredborg, B. K., Clark, J. M., & Smith, S. D. (2017). An examination of personality traits associated with Autonomous Sensory Meridian Response (ASMR). Frontiers in Psychology, 8, 247. https://doi.org/10.3389/fpsyg.2017.00247
7. Grossman, P., & Taylor, E. W. (2007). Toward understanding respiratory sinus arrhythmia: Relations to cardiac vagal tone, evolution, and biobehavioral functions. Biological Psychology, 74(2), 263–285. https://doi.org/10.1016/j.biopsycho.2005.11.014
8. Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. Journal of Environmental Psychology, 15(3), 169–182. https://doi.org/10.1016/0272-4944(95)90001-2
9. Lee, A. J., Oh, H. S., & Kim, H. S. (2021). Effects of auditory and audiovisual ASMR stimuli on psychological and physiological responses. Journal of the Korea Academia-Industrial Cooperation Society, 22(6), 480–488.
10. Lochte, B. C., Guillory, S. A., Richard, C. A., & Kelley, W. M. (2018). An fMRI investigation of the neural correlates underlying the Autonomous Sensory Meridian Response (ASMR). BioImpacts, 8(4), 295–304. https://doi.org/10.15171/bi.2018.32
11. McGlone, F., Wessberg, J., & Olausson, H. (2014). Discriminative and affective touch: Sensing pleasure and pain. Neuron, 82(4), 737–755. https://doi.org/10.1016/j.neuron.2014.05.001
12. Poerio, G. L., Blakey, E., Hostler, T. J., & Veltri, T. (2018). More than a feeling: Autonomous sensory meridian response (ASMR) is characterized by reliable changes in affect and physiology. PLoS ONE, 13(6), e0196645. https://doi.org/10.1371/journal.pone.0196645
13. Poerio, G. L., Totterdell, P., Emerson, L.-M., & Miles, E. (2021). ASMR: A feeling of relaxation and calm. In R. R. Bootzin (Ed.), Advances in psychology research (Vol. 141, pp. 93–112). Nova Science Publishers.
14. Porges, S. W. (2001). The polyvagal theory: Phylogenetic substrates of a social nervous system. International Journal of Psychophysiology, 42(2), 123–146. https://doi.org/10.1016/S0167-8760(01)00162-3
15. Roberts, N., Beath, A. P., Boag, S., & Paloyelis, Y. (2020). Sensory reactivity and personality predictors of ASMR. Consciousness and Cognition, 85, 103046. https://doi.org/10.1016/j.concog.2020.103046
16. Smith, S. D., Fredborg, B. K., & Kornelsen, J. (2019). A neuroimaging investigation of ASMR: Functional brain activation during ASMR tingles. Frontiers in Psychology, 10, 8. https://doi.org/10.3389/fpsyg.2019.00008