

Autonomous Sensory Meridian Response (ASMR) : A Neuropsychological Study

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Abstract. *Autonomous Sensory Meridian Response (ASMR)* is a phenomenon that is extensively discussed in many countries, and it is something distinct and intriguing to research from a neuropsychological standpoint. This study used a literature review method to examine ASMR in the neuropsychological sector, specifically in terms of sensation and perception, cognitive and behavioral aspects that have been studied between 2013 and 2023. According to the findings of the study, not everyone can experience ASMR, and those who are susceptible to ASMR respond to general ASMR stimuli that are audio sensory, visual sensory, or both. The digital ASMR stimulus has the potential to be an intervention for a variety of benefits, including stress and anxiety reduction, relaxation, improved food and drink behavior, consumer behavior, and matters relating to a person's psychological well-being.

Keywords : *ASMR, neuropsychology, cognitive, perception, behaviour.*

Abstrak. *Autonomous Sensory Meridian Response (ASMR)* merupakan fenomena yang sedang banyak dibahas pada konteks berbagai negara, dan menjadi hal yang unik dan menarik untuk dipelajari dari sudut pandang neuropsikologis. Penelitian ini menggunakan metode tinjauan literatur untuk menganalisis ASMR dalam bidang neuropsikologis baik dari segi sensasi dan persepsi, kognitif hingga perilaku yang telah diteliti pada rentang 2013-2023. Hasil penelitian menunjukkan bahwa tidak semua orang dapat mengalami ASMR, dan bagi yang sensitif ASMR, memberikan reaksi pada stimulus umum ASMR yang bersifat audio sensori, visual sensori, maupun keduanya. Stimulus ASMR digital berpotensi sebagai intervensi untuk beberapa kemanfaatan, seperti mereduksi stress dan kecemasan, membantu relaksasi, meningkatkan perilaku terhadap makanan dan minuman, perilaku konsumen, serta hal terkait kesejahteraan psikologi seseorang.

Kata kunci : *ASMR, neuropsikologi, kognitif, persepsi, perilaku.*

INTRODUCTION

Autonomous Sensory Meridian Response (ASMR) : A Neuropsychological Study

The field of neuropsychological knowledge continues to grow in line with developments in technology and civilization. In recent years, there has been increasing interest in a previously unknown sensory phenomenon, called Autonomous Sensory Meridian Response (ASMR), which is considered a unique anomalous sensory experience, which has so far escaped the attention of scientific research in Indonesia. According to one study, ASMR is a complicated emotional phenomenon that some people only experience when they hear, see, or feel specific "triggers" including whispering, tiny hand motions, and light touches (Poerio, 2020).

Andersen (2014) cites Tuffnel. This phenomena became a trend at least in 2008, as evidenced by the establishment of an online community on YouTube dedicated to creating, collecting, and exchanging ASMR videos. Unlike other psychological sensory phenomena, which are first seen in the laboratory and subsequently spread to the public, ASMR exhibits an unusual reversal pattern, which was first observed through informal online discussion forums. Its online community, known as the ASMR community or 'Whisper Community,' grew out of a small online forum and is still growing today. The creators of the website (<http://www.asmr-research.org>) gave the name Autonomous Sensory Meridian Response (ASMR) to the content providers on YouTube in 2009 (see Andersen, 2014; Smith & Snider, 2019; Mahady et al., 2023).

ASMR is not something that everyone feels, but the trigger or stimulus is consistent for those who do. When people realize that ASMR is a "thing," they tend to assume that everyone has the same experience, or that it only happens to them

(Poerio, 2016; Poerio et al., 2018; Poerio, 2020). Gentle touches, whispers, delicate conversation, close personal attention, subtle hand movements, and sharp sounds are all common ASMR triggers or stimuli (Barrat & Davis, 2015; Barrat et al., 2017). Lochte et colleagues (2018) used fMRI to study this common stimulus and discovered that ASMR sensitive subjects showed high activity in areas connected to emotions of reward and emotional arousal. This study found that people who are sensitive to ASMR had distinct brain activity in their Default Mode Network (DMN) than people who are not sensitive to ASMR. ASMR has captured the interest of millions of individuals worldwide, but comprehension of this phenomena remains restricted, particularly when examining the underlying neuropsychological components. The purpose of this research is to understand ASMR from a neuropsychological standpoint in connection with past studies on this sensory phenomenon. The authors aimed to validate past research and close information gaps about ASMR. This article specifically aims to answer the following questions: ASMR is a neuropsychological study that investigates brain phenomena associated with human behavior, emotions, and cognition.

METHODS

The literature review method was employed in this writing. A literature review is the search and reading of books, journals, and other publications connected to the research topic to write a scientific paper in a qualitative descriptive manner on a certain topic or issue (Snyder, 2019). In this study, researchers conducted a literature analysis by assessing scientific publications from international journals as research data, which meant that the search results were restricted to studies published between 2013 and 2023. ASMR, autonomous sensory meridian response, brain tingling, brain orgasm, neuropsychology, cognition, perception, and behavior are the keywords employed.

In our literature search, we developed the following criteria:

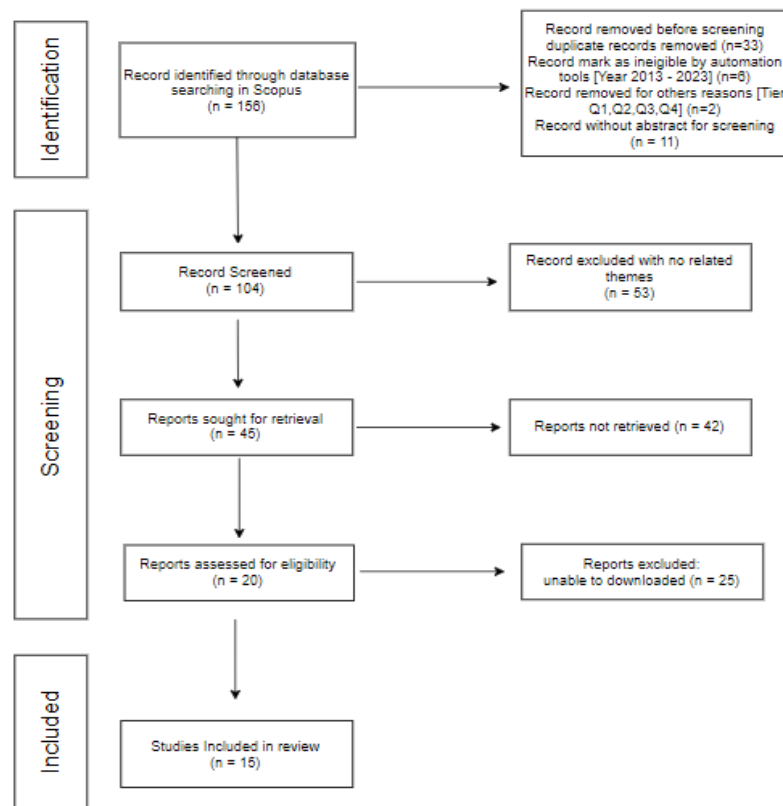
Table 1. Criteria for literatur review document inclusion and exclusion

Criterion	Dimension
Inclusion	Articles are indexed on the Scopus database;
	Article simultaneously cites the phrase ASMR and cognitive in the title, abstract and keywords;
	Articles simultaneously cite the phrase ASMR and perception in the title, abstract and keywords;
	Articles published between 2013-2023.
Exclusion	Literature documents are not in English;
	Documents do not qualify as articles, editorials, and reviews;
	Document exceeds the last ten years;
	Documents are not included in the journal ranking section Q1, Q2, Q3, Q4;
	Documents failed to meet the relevance requirements, which took into account characteristics like writing coherence, technique constraints, and accessibility.

We used the Scopus database as a primary source of information during the literature search. Scopus was chosen because it is widely recognized as having a solid literature reputation with a very large and extensive coverage base for indexing journals on a worldwide basis. PRISMA rules are used in the data gathering process to provide transparency and

consistency in identifying and characterizing variables. Several processes are included in this strategy to assure accuracy, consistency, and transparency in the data collection process.

RESULTS AND DISCUSSION



Picture 1. Flow chart of study selection literature review process using PRISMA

Richard describes the ASMR phenomena in his book, *Brain Tingles* (2018), as a relaxing and pleasurable tingling feeling experienced by individuals from the head to the entire body. Everyone may not have this sensation. ASMR can be activated by delivering a stimulus, such as soothing whispers, gently playing with your own hair, or carefully opening a gift. He noted that each person's sensory preferences may differ, particularly when it comes to selecting food or music. Aside from that, the book claims that ASMR stimulation can be advantageous since a reaction occurs, resulting in the release of chemicals in the brain such as endorphins, dopamine, serotonin, GABA, and melatonin.

Engelbregt (2022) confirms the effects of positive stimuli by stating that ASMR is a warm tingling sensation that is frequently accompanied by emotions of calm and relaxation. The study looked at how ASMR affected mood, attentiveness, heart rate, skin conductance, and EEG in healthy young individuals. According to the findings, ASMR audio clips with intimate whispering boosted cognitive capacities such as attention performance and decision making. Aside from cognitive performance, Sakurai's (2023) research demonstrates that ASMR movies can improve mood and alleviate symptoms of insomnia and despair. According to Poerio's (2018) research, ASMR stimuli have a substantial impact on the mental and physiological elements of those who experience them.

ASMR and Cognitive Function

Wang et al., (2020) conducted research on executive functions (working memory, inhibitory control, and set shifting) and attempted to answer how ASMR influences the performance of brain hemispheres with special executive

functions using experimental methods. The experimental group had a higher level of comfort after watching ASMR videos than the control and baseline groups, according to this study, which used an experimental approach on three groups, namely the experimental, control, and baseline sections. Executive function was weaker in the experimental group that experienced ASMR than in the control group. This is possible because experimental participants in this study received three times the ASMR treatment compared to the baseline or control group, implying that the hypothesized impact of ASMR could relax areas of the brain and impair executive function at work (Barratt et al., 2017).

Jennifer et al (2023) discovered that there is a reduction in cortical thickness in a number of areas such as the left precuneus, precentral gyrus, insula, and orbitofrontal cortex in people who can experience ASMR and people who cannot experience ASMR. This states that there is a difference in the thickness of the brain structure between people who can and cannot sense ASMR. According to Glim et al (2022) research on meditation, which can boost ASMR auditory stimulation, ASMR has a connection pattern in the brain. Glim investigated this by conducting trials on 90 participants while listening to various ASMR stimuli (whispers, scratching sounds, etc.). This study found that mindfulness practice can increase the perception of ASMR-related "tickling," implying that body meditation can improve the body's processing of sensory information and that there are benefits to mindfulness practice for enhancing sensory experiences.

In their study on brain connection and ASMR, Stephen et al. (2020) discovered that individuals varied in their susceptibility to ASMR. This study took the form of an experiment in which 15 Canadians ranging in age from 18 to 37 years were subjected to several varieties of ASMR during an MRI. Stephen's research discovered that a variety of stimuli, such as the sound of the mouth when speaking or chewing, can cause people to experience ASMR. However, repetitive noises, contact sounds, and activity sounds (sounds of people painting, sounds of pencil scratching, and so on) show a negative link with ASMR sensitivity.

Other findings regarding arousal and feelings in people with depression and insomnia which were associated with ASMR were carried out by Smejka & Wiggs (2022) who found that ASMR could increase positive emotions and reduce arousal in participants, this was also supported by a decrease in symptoms of insomnia and depression due to the release of hormones. oxytocin and endorphins which can stimulate calm and peace in participants. This research is in line with that conducted by Poerio et al., (2018) who found that the ASMR experience was associated with increased positive feelings and a sense of relaxation. In fact, what is interesting about this research is that there were no differences found between insomniacs and the control group, which means that the experience of experiencing ASMR had a greater effect on the depressed group than insomniacs.

The perception of pain associated with the ASMR effect has also been studied by McErlean et al. (2022) and found that ASMR was linked to increasing sensitivity to pain, especially to tactile stimulation. However, there were findings regarding the results that were not significant regarding differences in pain tolerance between the experimental group and the control group. Even though objectively the level of tolerance for pain was the same between the ASMR group and the control group, what the ASMR group felt in assessing pain was quite intense. This is in line with research conducted by Lochte et al., (2018) in research using fMRI tools for ASMR that ASMR activity is related to increasing activity in parts of the brain involved in somatosensory and pain perception. ASMR-related activities can be characterized by high sensitivity to several sensory sources (Roberts et al., 2020). This is consistent with Lochte et al.'s (2018) research using fMRI methods

for ASMR, which found that ASMR activity is associated with increased activity in areas of the brain implicated in somatosensory and pain perception. ASMR-related activities are distinguished by heightened sensitivity to a variety of sensory stimuli (Roberts et al., 2020).

ASMR on Sensation and Perception Functions

The right hemisphere is critical not only in emotional communication tasks, but also in the generation of the vegetative component of emotional responses and the concomitant subjective experience of emotions (Gainotti, 2020). According to the study's findings, three feelings change: relaxation, tension and anxiety reduction, and increased psychological well-being.

Sakurai et al (2021) explain research on ASMR's ability to bring relaxation to individuals, where classical music and ASMR audio stimuli provide a pleasant and soothing impact. According to the study, ASMR stimulation involves more sophisticated brain activities than classical music, particularly activation of the medial prefrontal cortex, which is regarded to be simpler to employ and adapt to health. Furthermore, ASMR stimulation causes arousal, attentiveness, and positive emotional connections, which leads to enhanced alpha brain activity, a lower heart rate, increased skin conductance, and pupil dilation. Furthermore, people who have these sensations have lower functional connectivity in resting-state networks, indicating less compartmentalization within the brain. Cross-activation occurs between brain regions that are ordinarily isolated (Mahady et al., 2023).

According to other studies, ASMR can alleviate tension and anxiety. Ohta and Inagaki (2021) back this up with their research on the usefulness of ASMR in lowering mental stress using EEG tests. The findings reveal that there are significant differences in alpha and beta-band activity between resting and doing mental tasks, implying that ASMR has the potential to relieve mental stress. According to the findings of Eid et al (2022), there is a positive association between ASMR, neuroticism, and anxiety. It was claimed that the experience of people who do ASMR by watching videos can help reduce anxiety.

McGeoch and Rouw (2020) contributed evidence showing there is an automatic and powerful emotional response to ordinary sounds that happens in ASMR and misophonia, which improves a person's psychological well-being. This happens as a result of synesthetic cross-activation of the insula by activity in the auditory cortex. Misophonia causes a decline in well-being while increasing sympathetic activity. Whereas in ASMR, it appears that emotional well-being grows along with the assumption, resulting in a total increase in parasympathetic tone. Woods and Turner-Cobb (2023) discovered that female students who utilized ASMR simulations experienced health advantages and increased their emotional well-being. ASMR stimuli are used to treat anxiety and sleep difficulties.

According to the findings of Noriko et al (2023), there is a substantial variation in response between auditory and audiovisual stimulation on the activation of brain areas when someone receives ASMR stimulation. However, no changes in mood were discovered as a result of data analysis. The middle frontal gyrus and nucleus accumbent were activated by audiovisual stimulation, but the insular cortex was activated by auditory stimulation. As a result, there are significant changes in "relaxed mood" and "tingling mood" responses to auditory and visual stimulus versus auditory stimulation just. This distinction demonstrates that there is a difference in mental health impacts between auditory and audiovisual stimulus in brain activation.

Giulia L. et al. (2022) discovered that the ability to perceive ASMR, as well as its strength, may be dependent on enhanced sensory sensitivity to exteroceptive and interoceptive signals. Stronger ASMR, according to these researchers, is based on at least two mechanisms involved in translating external input into subjective sensations, such as increased sensory sensitivity to external signals and increases in ASMR triggers. As a result, letting go may be difficult, and greater interoceptive awareness engages sensory stimulation into a stronger interior emotional reaction to ASMR triggers.

ASMR on Behaviour

Although ASMR appears to be a thrilling experience of a regular, automatic, and rather common stimulus, its precise nature remains uncertain. According to the findings of a survey study using the Flow State Scale done by Barrat and Davis (2015), persons with greater ASMR sensitivity scores reported experiencing or detecting ASMR stimuli more frequently. They also discovered that people who intentionally engage in ASMR stimulation can boost the mood of someone who is depressed now they do it. Even though they did not experience a tingling sensation, their pain problems and mood improved. This is comparable to how mindfulness training with ASMR stimuli can enhance mood in people with and without depression. Previous studies by Poerio (2018) and Brito et al. (2022) found that ASMR stimuli improve mood.

Poerio et al. (2018) investigated the emotional and physiological aspects of ASMR reactions, finding that watching ASMR videos boosted the pleasant effects in those experiencing ASMR. Furthermore, according to Engelbregt (2022), ASMR relates to a reduction in heart rate and an increase in skin conductance levels. ASMR was claimed in the study to boost cognitive skills such as attentional performance or decision making, which connects with people's cognition as indicated by their behavior (relaxed, calmer, less worried, and so on). Greer (2022) investigated the relationship between ASMR and anxiety and neuroticism, discovering that persons who had ASMR had greater levels of neuroticism, and people with higher levels of anxiety were more likely to experience ASMR. These findings are based on the work of Fredborg et al. (2017), who investigated the link between ASMR and personality factors. Individuals who experienced ASMR had higher Openness-to-Experience and lower Conscientiousness scores, as well as higher Neuroticism and lower Extraversion and Agreeableness ratings. Although empirical support is still lacking, ASMR stimuli that consider personality traits have the potential to be used as an intervention to reduce anxiety (Greer, 2022), increase behavioral experiences towards food digitally (Spence, 2023), in the tourism sector (Moreno-Lobato, 2023), and to advertising practices (Pilny et al., 2023).

ASMR and social media research in the digital era presents great prospects for leveraging ASMR effects in marketing and advertising techniques, particularly in the context of consumer behavior. Pilny et al. (2023) investigated the influence of ASMR stimuli on consumers' levels of closeness, utilizing the moderator personality qualities extraversion and agreeableness as moderators. The findings of this study indicate that ASMR stimuli have a favorable effect on the closeness of customers who are ASMR sensitive and have the personality traits of extraversion and agreeableness. Previous research on the effects of stimuli on sensation and perception (Andersen, 2015; Barratt & Davis, 2015; Kovacevich & Huron, 2019) backs up this finding. This can be noticed in customer behavior when seeing particular adverts that feature ASMR stimulation. Despite what researchers claim, this impact is still confined to persons who are sensitive to ASMR and is influenced by other factors such as extraversion and agreeableness. Chae (2021) highlights the function of ASMR in fashion customer behavior as a mediator of commitment and nostalgia generated by ASMR stimuli in his study on ASMR marketing.

CONCLUSION AND RESEARCH SUGGESTION

ASMR has been shown to have an effect on executive function in terms of logical and analytical thinking abilities. According to some of the reviewed literature, ASMR intervention can reduce cognitive performance and have a relaxing effect on the body, particularly in the head and neck area. An ASMR intervention increases brain activity by creating alpha waves, which causes a loss in cognitive control, reduces the pulse rate, and widens the pupils. The brain will also generate the hormones serotonin and endorphins throughout this process, which cause sensations of peace and happiness. This is consistent with a person's feeling of pain, and it can occur because relaxing has a good influence on the neurological system, including the somatosensory cortex, which is the pain control center. Increased attention to ASMR stimuli may stimulate the somatosensory cortex more than usual.

Aside from executive function, ASMR has an impact, particularly in comprehending the circumstance that occurs. ASMR experiences have been shown in multiple studies to promote happy emotions and decrease arousal in individuals. This occurs because ASMR stimulation causes the brain to relax by generating the hormones oxytocin and endorphins, which can induce emotions of calm and tranquility. When individuals are given ASMR intervention, the brain undergoes synesthetic cross-activation of the insula by activity in the adjacent auditory cortex, resulting in significant differences in both relaxed and tingling mood conditions in response to auditory stimulation that causes a tingling effect in the head area up to the neck. There are significant changes in brain activity that produce alpha and beta-band waves between resting conditions and conditions performing mental tasks so that ASMR is associated with reducing anxiety levels in individuals.

ASMR has several positive benefits when examined through the lens of Psychological Well-being, specifically an improvement in Psychological Well-being, which has an impact on reducing stress and anxiety as well as happy sentiments after ASMR treatment. This is due to the emotional response of ASMR, which includes improved emotional well-being as well as an increase in parasympathetic tone. When exposed to particular ASMR triggers, a person may sense a more powerful emotional reaction, such as comfort or delight.

ASMR stimulation has positive consequences and vice versa. ASMR has benefits when utilized for meditation or relaxation. According to the findings of this study, ASMR can promote happy sentiments in people. ASMR has the ability to alleviate tension and anxiety in individuals, as evidenced by changes in alpha and beta activity during mental tasks. ASMR does not always have a beneficial impact, and there are some negative consequences. Previous research has indicated that ASMR can have an effect on lowering a person's arousal. Another negative effect of ASMR is that it can enhance a person's sensitivity to pain. This is due to the fact that ASMR can increase activation in areas of the brain involved in somatosensory and pain perception across multiple sensory sources. According to one study, people who experience ASMR have higher degrees of neuroticism.

This study is confined to a review of past ASMR literature from a neuropsychological standpoint. One of the drawbacks of this literature evaluation is that there is little research that completely describes the brain dynamics and their relationship to changes in behavior in individuals who experience ASMR. On the other hand, this study still has flaws in the range of approaches assessed, which can affect a more definite grasp of the topic of ASMR, as well as time constraints in initiating the research. Researchers may have overlooked study on new breakthroughs in the field of ASMR research. Future researchers who are interested in discussing this topic should conduct literature research based on meta-analysis to

statistically combine findings in order to gain a better understanding and compare various influencing factors or variables by comparing the influence of various factors in the same situation.

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