



A critical investigation analysing the key determinants of artificial intelligence in enhancing employee engagement in multinational companies

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ABSTRACT

Article History

Received: 23 January 2023

Revised: 17 April 2023

Accepted: 12 May 2023

Published: 31 May 2023

Keywords

Artificial intelligence
Correlation analysis
Cronbach's alpha
Employee engagement
Employee productivity.

The objective of the study is to determine whether artificial intelligence (AI) tools, software, and technology can assist management in identifying intangibles such as the employee engagement level and offer hints as to what factors influence it and how management can work to enhance it. A descriptive study was carried out to better understand the research topic. A structured survey questionnaire was employed to collect the data, in which the closed-ended questions used a Likert-type scale. The questionnaire measured AI's effects on productivity, organisational effectiveness, employee satisfaction, and employee engagement. The survey was published on Google Forms, and a link was provided to the respondents. The data were analysed using the Statistical Package for Social Sciences version 28. Statistically significant results were obtained on the association between AI and the determinants of organisational effectiveness, increased productivity, employee satisfaction, and employee engagement. AI thus influences the study variables, and the results are statistically significant. The employees of an organisation will adopt and use new technologies if the technology is easy to use and adopt and beneficial to them. The management of organisations can source technologies like AI and other tools that are easy to use, and they can implement such technologies in a phased manner, educating employees on the advantages and benefits of the technology to maximise employee engagement.

Contribution/Originality: This study critically investigates the key determinants of AI in enhancing employee engagement in multinational companies. The findings of the study will help the industry apply AI technologies to increase employee engagement and strengthen staff management. This is the first such study to research the application of AI technologies to enhance employee engagement in multinational companies.

1. INTRODUCTION

One factor that has a significant bearing on the performance of a business is the level of employee engagement. The authors found that workplaces where workers report feeling excited about their occupations experience a 43% rise in overall productivity. It is crucial that key personnel be actively engaged from the beginning and throughout the process. If a company is unable to locate an adequate substitute for a critical worker, then this becomes an even more pressing concern as they need previous work experience in the industry to obtain the specialised knowledge, competence, and client relationships necessary for success. Because of their obvious significance, they can be open to suggestions from outside the firm. Workers who are emotionally involved in their jobs, as well as the success of the

organisation as a whole, are more productive and less likely to quit their jobs. One must be well-versed in both management theory X and management theory Y to have a complete understanding of the relevance of employee engagement. The terms "management theory X" and "management theory Y" refer to two basic ways of motivating employees (McGregor, 1960). According to McGregor, theory X seeks to boost morale at work by monitoring and rewarding or punishing employees, whereas theory Y seeks to do the same by giving workers greater discretion in their work and reducing the need for close management. Every strategy for increasing employee engagement comes with unique advantages and disadvantages. Whether for better or worse, any management solution based on artificial intelligence (AI) relies on theory X. Workers are monitored by automated management software, which evaluates their performance and assigns appropriate incentives or punishments. These kinds of strategies may be helpful for Uber and other platforms in the gig economy (Marquis, Kim, Alahmad, Pierce, & Robert Jr, 2018). On the other hand, AI management systems may also be used in conventional companies. Employers use organisational controls to motivate their workforce to operate in a manner that contributes to the achievement of the company's purpose and goals. Input and output controls are both a part of organisational controls, with output controls being used far more often in practice. The behaviours of workers are observed and recorded to enforce behavioural control. A dispassionate appraisal of the results that a worker's efforts have produced is an essential part of outcome control. Several platform organisations have started employing AI-based management tools to exert more authority over their employees. For instance, the AI-powered Uber app tells the driver who to pick up, where to go, and when to drop them off at their destination. Given the importance of organisational control within organisations, the use of AI management systems will probably come more prominent. According to Wijayati, Rahman, Rahman, Arifah, and Kautsar (2022), AI significantly improves worker engagement and performance. Effective change leadership favourably modifies the impact of AI on worker performance and engagement (Schaufeli, 2012). With employee engagement, AI can manage staff members by inspiring and directing their behaviour. Whether such systems will successfully manage employees, in the long run, depends mainly on the concerns associated with trust, perceived risk, and justice. In addition, if businesses want to promote AI-driven technologies, they must be simple to use and seen as valuable (Hughes, Robert, Frady, & Arroyos, 2019). Garg, Kiwelekar, Netak, and Ghodake (2021) offered a novel method for understanding employee involvement in a logistics business by utilising deep natural language processing ideas. Rao, Chitranshi, and Punjabi (2020) opined that the application of AI in human resource practices can bring about enhanced employee engagement and employee retention. Bakker and Leiter (2010); Bakker, Albrecht, and Leiter (2011), and Bakker and Albrecht (2018) discussed current trends in work engagement, with AI playing a mediating role. According to the findings of the Council (2004), employee engagement is the single most significant factor that influences employee retention. Throughout the research project, which involved interviews with more than 50,000 workers at 59 different companies in 39 different countries, it became clear that highly motivated individuals are 87% less likely to quit their jobs. AI is a powerful advocate for involvement; it inspires companies to learn as much as they can about their employees and what they need from the organisation. AI also inspires employees to become more involved in their work. Utilising AI in a commercial setting may result in several advantageous effects. Data analysis that incorporates AI can throw light on the unemployment rate and show the underlying causes of employee turnover. Not only will the analysis of workers' emotions define their career path based on their behaviours and motivation, but it will also find signs that may function as warning bells. According to the report "State of the Global Workplace," an astounding 85 per cent of workers across the world are not engaged in their jobs. It is estimated that this problem will result in a staggering \$7 trillion worth of lost production worldwide (State of the American Workplace Report, 2017).

It is alarming that more than 67 per cent of workers are "not engaged," as this represents the vast majority of employees; they may be uninterested in their job for a variety of reasons (e.g., lack of time, lack of desire, lack of respect, etc.). According to Jim Harter, Chief Scientist for Workplace Management and Well-Being, this international engagement pattern shows that the way in which performance is managed, particularly the way in

which people are developed, is misfiring. Annual reviews have become the standard method businesses use to provide employees with feedback and evaluate their overall performance. In today's workforce, opportunities for growth, consistent communication, and other benefits are still highly sought after. A coach rather than a supervisor is also one of the most desired positions. Employees believe that their life and their work are closely intertwined, and as a result, they want their work to define who they are. Experts believe that the pace of technological progress is one factor contributing to the engagement conundrum. In addition, according to Bersin (2004), job possibilities, both new and current, are being created, not just eliminated. About once every two years, something occurs that has the potential to drastically change the way a company runs. Despite the opinions of professionals in human resources, many of those who work in the industry still feel anxious about the imminent advent of AI. According to Meister and Mulcahy (2017), there is fear over AI. There is a great deal of uncertainty among human resources professionals about how they should be using AI to enhance the experience of working for a company.

2. LITERATURE REVIEW

Ethical considerations must be integrated into processes involving AI. People's perceptions of the fairness of the procedures of an organisation are referred to as its "procedural fairness" (Holbrook, 1999; Saunders & Thornhill, 2003). An AI management system's rules and practices are reflected in the employees' perceptions of the fairness of its decision-making process. When employees under an AI management system believe the system's decision-making processes are inconsistent or biased, and when such employees have no avenue for voicing their displeasure with the system's decisions, procedural fairness is compromised. This is because procedural fairness depends on employees being able to express their disagreement with the system's decisions (Leventhal, 1980). The procedures for managing complaints, grading performance, and expressing opposition to new regulations are all aspects of procedural fairness for people working for companies that are managed by AI systems.

The degree to which individuals perceive that outcomes and resources are divided fairly is referred to as distributive fairness (Greenberg & Colquitt, 2013). Praise and monetary rewards are common ways of distributing outcomes and resources. Confidence in the system across the workforce grows when employees think that the AI management system will result in fair compensation. However, distributive fairness can be problematic if workers believe that the usage of the AI management system contributes to or exacerbates existing wage disparities. The phrase "interactional fairness" is used to describe the manner in which workers are treated when they make choices at their place of employment. The concept of fairness in the workplace may be broken down into two categories: informational fairness, which refers to the degree to which processes are described openly and honestly, and interpersonal fairness, which is the degree to which workers are respected. The degree to which workers feel that the AI respects them and the extent to which they are given an explanation of the judgements made by the AI are both critical components of the fairness of this kind of engagement.

People only see value in a technological advancement if they can easily make use of it. This has been shown to be an accurate indicator of the amount of technology that is consumed. In recent times, it has been used to predict the future of e-commerce platforms such as eBay. It has also been established that it is crucial for customers to have faith in the effectiveness of AI-powered management systems. We take into account both usability and ease of use to gain a deeper understanding of trust and the role that it plays in the implementation of AI management systems. The employee's perception of how simple and problem-free it is to use the system is a good indication of the system's usability. When we talk about the usability of a system, that means it can be learnt quickly and efficiently with very little effort. Workers are more inclined to adopt new technologies if they believe that using such technologies will be straightforward (Venkatesh & Davis, 2000). It is possible that individuals will not accept complicated technology because they are afraid of the difficulties that may arise. When it comes to AI management systems, employees are less inclined to accept those that are difficult to deal with. If AI management solutions are generally seen as easy to use, then employees may be more receptive to them. The degree to which employees are

persuaded of a system's advantages is a good predictor of how helpful they consider the system to be (Venkatesh, Thong, & Xu, 2012). This often translates to either improved job performance or a reduction in the amount of time spent on the same responsibilities. When employees see the benefits that may be gained by using a system, they are far more likely to do so to successfully complete their tasks (Venkatesh, Morris, Davis, & Davis, 2003). People are more inclined to accept and use an AI that they believe will benefit them. Although the qualities of an engaged workforce differ from one organisation to the next, they have one thing in common: a dedication to the prosperity of the company and the people who work for it. Whether or not an employee believes their work has value and purpose is the single most critical element in determining their degree of engagement in their job.

On the other hand, many businesses only promote employee engagement once a year, during official events like annual evaluations. To achieve a grasp of engagement issues based on such a small number of encounters is unrealistic. It is impossible to take a "one size fits all" approach since businesses use a variety of indicators to evaluate the level of employee engagement, and the level of engagement varies from person to person.

To add insult to injury, in today's competitive employment market, traditional incentive techniques and low-key approaches to boosting employee engagement, have been around for a long time, are ineffective and provide subpar results. Strategies such as employee surveys, special committees, and restricted data analysis may occasionally backfire and make it more difficult to get actual feedback and helpful recommendations from staff members. Because of this, the introduction of AI has been hailed as a positive shift in businesses' approach to employee engagement. The fields of talent development, performance management, and the onboarding process for new employees are just some of the potential areas for modernisation. Those in leadership roles may experience decision fatigue when partnering individuals who get along well with one another. Managers can quickly assess which workers will be able to collaborate most successfully with one another using employee data, machine learning, and predictive data analysis. Increased staff involvement is expected to result from a more positive environment. Moreover, significant amounts of time are wasted when organisers try to schedule meetings around everyone's packed schedules. As a direct consequence of this, both interest and production decrease. AI might handle such monotonous jobs by analysing availability on calendars and identifying possible partners based on past experience together or other variables. This could be done automatically. In short, AI can be used to perform tedious jobs, freeing up more time for managers and team members to concentrate on the work. It is practically impossible to overstate the capacity of AI to improve employee morale in the workplace. Potential applications for AI-powered solutions include the management of talent and performance, monitoring productivity, learning and development programme improvement, competence improvement, trend prediction, and discovering critical issues.

Although the technology is still young, some AI-powered engagement tools are more beneficial than others. Currently, a significant number of people make use of technology that is powered by AI. Examples include chatbots and behaviour mapping. Inevitably, advances in AI will fast bring about significant changes in the character of the jobs we undertake. Professionals in human resources and learning and development will gain a better grasp of employee behaviour as a direct result of the fast emergence of cutting-edge AI algorithms in the global corporate landscape. It is evidence of our flexibility, as well as our readiness to accept change, that many revolutions have occurred as a direct result of the advent and widespread usage of current technology. Without a shadow of a doubt, we have embraced AI in all of its splendour and potential, which has enabled us to adapt as a species and allowed multinational corporations to transition into technology-driven enterprises. Nevertheless, companies are responsible for recognising that the millions of people they employ are the engine that powers their success.

2.1. Research Gap

A thorough review of the literature did not reveal a single study on AI use and its effect on employee engagement with key determinants such as enhanced productivity, employee satisfaction, and organisational engagement. Therefore, the authors have carried out this study by surveying multinational companies.

2.2. Research Hypotheses

H₀₁: There is a significant association between increased employee productivity and the application of AI to enhance employee engagement in an organisation.

H₀₂: There is a significant association between organisational effectiveness and the application of AI to enhance employee engagement in an organisation.

H₀₃: There is a significant association between employee satisfaction and the application of AI to enhance employee engagement in an organisation.

3. RESEARCH METHODOLOGY

A descriptive study was conducted to determine the effect of AI on employee engagement through increased productivity, organisational effectiveness, and employee satisfaction. Primary data were collected using a survey. Specifically, data were gathered using a 15-item questionnaire to measure the said variables. The research instrument employed a Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree. The authors developed closed-ended questions to elicit helpful replies from the respondents. Secondary data sources such as ProQuest, digital libraries online, published journals, dissertations, conference papers, and so on were used where required. Respondents were chosen using convenience sampling, a type of nonprobability sampling. The questionnaire link was sent to the sample population, and responses were collected from those individuals. The data collection yielded 149 replies. The data were subjected to statistical analysis using the SPSS data tool. The dispersion methods, frequencies, percentages, and correlations were calculated, and chi-squared tests were conducted.

3.1. Reliability and Internal Consistency of the Research Instrument

The reliability and internal consistency of the research instrument were evaluated by measuring the Cronbach's alpha statistic, split-half (odd-even) correlation, and Spearman-Brown prophecy. The values ranged from 0.92 to 0.97, 0.79 to 0.95, and 0.59 to 0.97, respectively, indicating strong internal consistency and reliability (Table 1).

Table 1. Reliability statistics of study variables.

Study variable	Cronbach's alpha	Split-half (odd-even) correlation	Spearman-Brown prophecy
Artificial intelligence	0.95	0.92	0.96
Increased productivity	0.96	0.90	0.95
Employee satisfaction	0.97	0.95	0.97
Organisational effectiveness	0.92	0.79	0.88

3.2. Data Analysis

To understand the impact of AI on employee engagement in an organisation, and to understand the critical determinants of AI in enhancing employee engagement, a correlation analysis was carried out, and the hypotheses were tested using chi-squared analysis.

4. RESULTS

4.1. Frequency Analysis

This section shows the frequency analysis based on the data collated from the respondents, who were individuals working in multinational companies.

Table 2 presents the results of AI support in improving employee engagement in the company. From an analysis of the sample population's responses, it can be observed that 36.9% of respondents agreed with the statement, 31.5% strongly agreed with the statement, 16.8% were neutral, and the remaining respondents disagreed or strongly disagreed (Table 2).

Table 2. AI supports better employee engagement in the organisation.

AI supports better engagement	Frequency	Percentage
Strongly disagree	8	5.4
Disagree	14	9.4
Neutral	25	16.8
Agree	55	36.9
Strongly agree	47	31.5
Total	149	100

Figure 1 illustrates the effects of AI on better employee engagement in the organisation. The results indicate that nearly 69% of respondents agreed or strongly agreed that AI can enhance employee engagement in the organisation. One result of better employee engagement is a reduction of employee turnover in the organisation; these results are examined and presented in Table 3.

The results in Table 3 show that 68.4% of the respondents agreed or strongly agreed with the statement that AI reduces employee turnover. On the other hand, 16.1% were neutral, and the remaining respondents disagreed or strongly disagreed with the statement. The pie chart in Figure 2 illustrates the results.

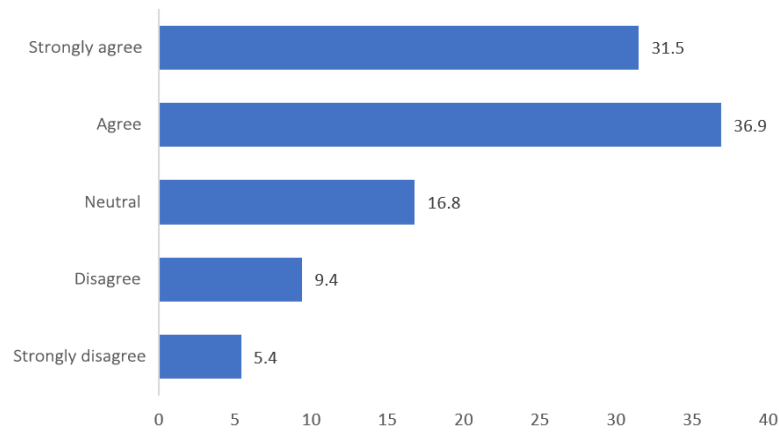


Figure 1. AI supports better employee engagement in the organisation.

Table 3. AI reduces employee turnover.

Reduces employee turnover	Frequency	Percentage
Strongly disagree	10	6.7
Disagree	13	8.7
Neutral	24	16.1
Agree	51	34.2
Strongly agree	51	34.2
Total	149	100

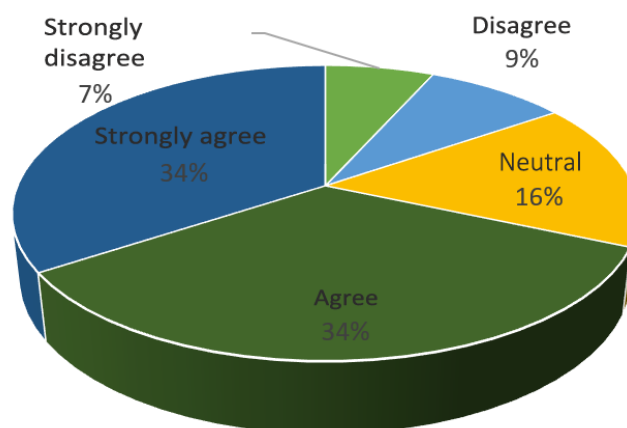


Figure 2. AI reduces employee turnover.

4.2. Correlation Analysis

To understand the nature of the association between the independent variables and AI, a correlation analysis was carried out. The results are presented in Table 4.

Table 4. Correlation analysis.

Pearson's coefficient	Increased productivity	Organisational effectiveness	Employee satisfaction	AI in employee engagement
Increased productivity	1	0.893**	0.833**	0.837**
Organisational effectiveness	0.893**	1	0.855**	0.842**
Employee satisfaction	0.833**	0.855**	1	0.757**
AI in employee engagement	0.837**	0.842**	0.757**	1

Note: ** indicates significance at $p < 0.001$, two-tailed.

From the correlation analysis, it can be noted that the coefficient of correlation between operational effectiveness and AI in employee engagement is +0.842, which shows that there is a positive association between the variables; the next highest correlation is noted between increased productivity and AI in employee engagement with +0.837; the correlation between employee satisfaction and AI in employee engagement is +0.757. Hence, all the independent variables have a highly positive correlation with the dependent variable.

4.3. Testing of Hypotheses

The data were subjected to a chi-squared test to test the hypotheses.

Hypothesis 1: There is a significant association between increased employee productivity and the application of AI to enhance employee engagement in an organisation.

Table 5. Chi-squared analysis of employee productivity and the application of AI to enhance employee engagement.

Chi-squared tests	Value	Df	P data
Chi-squared test	218.848	16	0.00
Likelihood ratio	172.841	16	0.00
Linear association	103.614	1	0.00

Based on Table 5, it can be noted that the significance value is 0.00, which is < 0.05 , hence there is a significant association between increased employee productivity and the application of AI to enhance employee engagement in an organisation; therefore, hypothesis H_{01} is not rejected.

Hypothesis 2: There is a significant association between organisational effectiveness and the application of AI to enhance employee engagement in an organisation.

Table 6. Chi-squared analysis of organisational effectiveness and the application of AI to enhance employee engagement.

Chi-squared tests	Value	Df	P data
Chi-squared test	227.742	16	0.00
Likelihood ratio	172.306	16	0.00
Linear association	104.993	1	0.00

Based on Table 6, it can be noted that the significance value is 0.00, which is < 0.05 , hence there is a significant association between organisational effectiveness and the application of AI to enhance employee engagement in an organisation; therefore, hypothesis H_{02} is not rejected.

Hypothesis 3: There is a significant association between employee satisfaction and the application of AI to enhance employee engagement in an organisation.

Table 7. Chi-squared analysis of organisational effectiveness and the application of AI to enhance employee engagement.

Chi-squared tests	Value	Df	P data
Chi-squared test	190.067	16	0.00
Likelihood ratio	150.649	16	0.00
Linear association	84.83	1	0.00

Based on [Table 7](#), it can be noted that the significance value is 0.00, which is < 0.05 , hence there is a significant association between employee satisfaction and the application of AI to enhance employee engagement in an organisation; therefore, hypothesis H_{03} is not rejected.

5. DISCUSSION

The level of commitment shown by employees is directly proportional to an organisation's success. Increasing the communication and collaboration between management and staff is one of the most efficient ways to motivate employees. The communicative and interactive capabilities of AI systems used in human resource management (HRM) allow for a more individualised and customised approach to dealing with workers. There has been an increase in the adoption of AI solutions across various aspects of human resources, which has had a favourable impact on employees' experiences on the job. On the other hand, research into the effects of AI-mediated HRM practices has shown that employees are not averse to using AI if it is helpful. Workers are said to have a positive view of the worth of the company when they are engaged in their job.

Employee turnover rates are high, over 10% in the top three industries – manufacturing, information, and transport ([Hansen, 2022](#)) – and continue to rise dangerously every year. Therefore, organisations need to work toward employee retention by maintaining employee engagement and catering to employee needs while keeping the organisation's mission in mind. It has been estimated by the [Work Institute \(2018\)](#) retention report that firms may anticipate spending \$680 billion on turnover expenses by 2020. In addition, they investigated the top 50 reasons why employees are dissatisfied with their current positions. More than any other factor, including salary and benefits, employee health, and the behaviours of supervisors and managers, career growth and work-life balance (or lack thereof) were mentioned as areas of concern. Because of advancements in AI, the concept of "understanding workers" has seen substantial development in recent years. Bots have progressed to the point that they can recognise patterns and anticipate human behaviour, thanks to breakthroughs in areas such as big data analysis, machine learning, and other fields.

This study surveyed the employees of multinational companies. The instrument showed internal consistency and reliability. The study findings are in line with [Rao et al. \(2020\)](#) on the role of AI in employee engagement and retention, [Dennis \(2018\)](#) on AI and recruitment, admission, progression, and retention, [Hughes et al. \(2019\)](#) on AI and employee engagement, fairness, and job outcomes, and [Sari, Min, Purwoko, Furinto, and Tamara \(2020\)](#) on better employee engagement with AI.

6. CONCLUSION

Businesses are increasingly resorting to AI technologies that promote engagement among their employees in order to improve staff management. The acts of the workforce, both those that are directed and those that are supported, bring about the desired results. However, trust, perceived risk, and concerns about justice are key in establishing whether or not such tactics for managing people will be successful in the long run. Fairness is also an issue that must be addressed. Before AI-driven solutions can be extensively embraced by businesses, they need to first be available to a diverse group of users and generally perceived as having positive implications in the business world. In this paper, we have taken a look at these concerns and how they relate to things like employee satisfaction, the sense that their work matters, and the ability to retain excellent individuals. The workforce must be persuaded that an AI management system is sensible and fair. When analysing the variables that contribute to the

confidence an employee has in their company, fairness is one of the most significant aspects that should be examined. A robust correlation exists between a worker's view of being treated fairly by a company and their level of devotion to their job. The equity-based literature on organisational justice is where the idea of fairness first emerged. The concept of equity advocates for the fair and equitable distribution of income and other benefits, considering each person's contributions. The link between an employee's anticipated contributions and the results the employee expects to obtain from his or her employer is sometimes referred to as "equity" in business situations. The word "equity" is frequently used in business contexts (Colquitt, 2012). When employees compare their efforts and productivity with those of their colleagues, they anticipate seeing an input-to-output ratio that is comparable to their own.

7. LIMITATIONS

- The sample was taken from several multinational companies; however, few respondents completed the questionnaire.
- The response rate from the informational technology industry was good; however, the responses from other industries, such as manufacturing and transport, were minimal.
- Literature on the key determinants of employee engagement is very sparse.
- In some companies and sectors, AI implementation is not prevalent.

The researchers left considerable space for similar research, particularly as this study was limited to 149 respondents. The involvement of more employees in suggesting ways to engage them through AI would further result in efficiently determining employee engagement using the key determinants examined in this study. There is a need to conduct more studies and interventions to understand the impact of AI on companies and employees. This research should study the behavioural, predictive, and analytical aspects; observations are yet to be made that delve deeper into the subject. Since this study recruited respondents based on ease of access and convenience, a larger sample should be taken and studied that takes age, gender, and geographical differences into account.

Funding: This study received no specific financial support.

Competing Interests: The authors declare that they have no competing interests.

Authors' Contributions: All authors contributed equally to the conception and design of the study.

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