The Review Of
DIABETIC
STUDIES OPEN ACCESS

Psycho-Sociocultural Determinants Of Cervical Cancer: Attitudes Towards The Human Papillomavirus Vaccine In Peru

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Abstract
Previous research has shown that cervical cancer is one of the main causes of death among women worldwide; despite this, significant percentages of the target population have shown attitudes of rejection towards the human papillomavirus vaccine. In this context, the objective of the study is to determine the degree of correlation between psycho-sociocultural factors and the attitude of parents of children towards the human papillomavirus vaccine. The research method is quantitative, non-experimental design, cross-sectional cohort, whose level of depth is descriptive-correlational; the sample is 99 parents of children who were in the fourth grade of primary education in a Public Educational Institution in the province of Yunguyo, in Puno, Peru; and an ad hoc Likert scale questionnaire was applied, with 25 items distributed among the studied variables. The results show that psycho-sociocultural factors are directly and strongly correlated with the attitude of parents (p-value=0.000, being < α=0.01); furthermore, both variables have a very high degree of negative correlation (r=-0.888). Therefore, psycho-sociocultural factors are determinants of the negative attitude of parents towards the human papillomavirus vaccine, so cervical cancer tends to be a perennial public health problem.

Keywords: attitude, psychological factors, social factors, cultural factors, psycho-sociocultural factors, vaccine, human papillomavirus.

Introduction

Cervical cancer is one of the leading causes of death among women worldwide, especially in low-income countries. It is considered one of the most common malignant diseases in the female population, causing approximately 342,000 deaths per year (Organización Panamericana de la Salud [OPS], 2023). The human papillomavirus (HPV) causes at least 630,000 new cases of cancer in women annually worldwide (Dera et al., 2023), in 2020 around 604,000 new cases of this disease were estimated worldwide (Organización Mundial de la Salud [OMS], 2023); in this sense, HPV causes 99% of cervical cancers (Garga et al., 2022). In the Americas, cancer is the second cause of death, and cervical cancer is common in women in Latin America and the Caribbean, where it is the third most common malignancy in women, causing about half of the deaths from this disease. Also, the impact on penile and anal cancer must be considered(Pan American Health Organization, 2019). Published statistics on cervical cancer (CC) show a higher proportion of women from poor population groups and with minimal education, residing in developing countries (Arzuaga-Salazar et al., 2012). Therefore, according to the World Health Organization (WHO), the application of the HPV vaccine, before the start of sexual activity and therefore before exposure to the virus, constitutes a safe and effective global health strategy to prevent and eliminate cervical cancer (Bruni et al., 2015; Gomes et al., 2022).

In Peru, cervical cancer has increased significantly in recent years, ranking second in new cancer cases and accounting for 6.5% of cancer deaths in women (Tokumoto-Valera et al., 2023), thereby demonstrating the global statistics of cancer caused by HPV. In the last two decades, it has been shown that HPV is responsible for almost all cases of cervical cancer, which has motivated the impulse for research to better and comprehensively understand carcinogenesis and develop preventive strategies related to HPV (Vall-Llossera et al., 2001). In an effort to reduce this cause of morbidity and mortality,

the HPV vaccine was developed, and despite its progress in vaccination coverage at the national level, in the period 2020-2023, resistance is observed among important groups of the target population (girls and boys from 09 to 13 years of age), to receive all the indicated doses, according to the Technical Health Standard that approves the National Vaccination Schedule (Ministerio de Salud [MINSA], 2024), these disparities in the completion of the series or non-compliance with the indicated doses, can lead to subsequent challenges and difficulties for parents and girls/boys (Mansfield et al., 2022). Given this situation, it is important to analyze and understand the psycho-sociocultural determinants of cervical cancer caused by HPV.

The nature of attitudes as psychological states represents the main challenge in their study, given their direct influence on people in a given situation. In this regard, attitudes are considered to have a multi-dimensional structure that manifests itself through components expressed in responses with conative characteristics, which reveal evidence of action for or against the object or situation toward which the attitude is directed. These dimensions include cognitive aspects, such as beliefs, expectations, and thoughts, as well as affective components referring to the moods and emotions that manifest themselves physically/behaviorally and emotionally about the object of the attitude (García, 2021; González, 1987; Núñez et al., 2010; Núñez & Tobón, 2005; Ovares, 2018).

On the other hand, social theory on human attitude examines the notion of trust, particularly in a context focused on knowledge, ignorance, and the faith that a person places in another, which fosters openness and assertiveness in interactions. This provides people with more resources to deal with stressful situations, avoiding negative attitudes in decision-making (Naranjo, 2010; Ovares, 2018). This progression that grants a person a role in society is based on several indicators, where education plays a fundamental role since it generates intellectual capital through the transfer of information, the result of human processes, and the construction of knowledge. In addition, as a person assumes a role, he or she develops a profile, which influences his or her competence and probably affects the information he or she has acquired, which, in turn, can influence the decisions he or she makes (Barzaga et al., 2019; Cobo, 2003; Moreno & Marcaccio, 2014).

Cultural factors also determine a person's attitude, meaning that the acceptance or rejection of something will depend on the specific cultural context. Cultural standards establish rewards for those who follow the rules, and punishments for those who defy them. Thus, the culture in which one operates significantly influences one's behavior and attitude. This influence can manifest itself in the way we process our thoughts, emotions, and actions in certain social situations (Cobo, 2003; Lattanzi, 2019).

Therefore, considering those psycho-sociocultural determinants of cervical cancer, the article seeks to analyze and interpret the attitude of parents regarding the application or not of the HPV vaccine in girls and boys of a Primary Educational Institution in Yunguyo, Peru. In this way, from the paradigm of primary health care, it is intended to contribute to the promotion and prevention of reproductive health of the population from an early age, at local, regional, and global levels.

Materials and Methods

Design

The present study is based on the quantitative cross-sectional cohort approach because it involves the collection of data to confirm hypotheses through numerical measurements and statistical analysis, with the aim of detecting patterns of data behavior (Hernández-Sampieri & Mendoza, 2018). With a non-experimental design, whose level of depth in its analysis is descriptive correlational, since this study focused on providing descriptions and interpretations of the association between the variables studied (Sousa et al., 2007). Parents of 4th-grade primary school students were chosen, who according to Technical Health Standard (THS) No. 196-MINSA / DGIESP-2022 of the Ministry of Health of Peru, were about to receive the Human Papillomavirus vaccine, in the study period: academic year 2023.

Sampling

Participants in the study were considered through the census sampling technique, in the sense that the sample represents the entire population, and this approach is used when it is required to know the opinions of the entire population or when an easily accessible database is available (Sánchez-Mendoza et al., 2023). Thus, the study sample amounts to a total of 99 parents of girls and boys enrolled in the

4th grade of the Primary Educational Institution No. 70245 of the province of Yunguyo, who according to THS were close to receiving the HPV vaccine. Data collection was carried out through the "survey" technique and the "questionnaire" instrument, which was applied in a personalized way to the parents of girls and boys of the aforementioned educational institution.

Measurements

Taking into account that the study seeks to analyze the association between the attitude towards HPV (X) and psychological factors (Y1), social factors (Y2) and cultural factors (Y3) of parents, and in the absence of an ad hoc instrument, The Attitude and Psychological, Social and Cultural Factors (APSCF) questionnaire has been designed and developed, in order to have an instrument adapted to the institutional and sociocultural context, and that responds to the objectives of the study.

The AFPSC questionnaire on the HPV vaccine has been designed and developed in three segments in coherence with the variables studied: in the psychological factors segment, four items (1, 2, 3, and 4) have been used to measure the perception of the HPV vaccine, three items to evaluate fear (5, 6 and 7) and three items (8, 9 and 10) to measure anxiety, all items according to the Likert-type scale, with three levels or scales as follows: Agree (3), indifferent (2) and disagree (1). These items were scored reversely.

The social factors segment was used to measure the educational level, classifying each level as complete or incomplete, and the level of knowledge about HPV, according to the three-level Likert-type scale, coded as follows: Agree (3), indifferent (2), and disagree (1). These items were scored positively.

In the cultural factors segment, four items (14, 15, 16, and 17) measure the influence of beliefs on the acceptance of the HPV vaccine; three items (18, 19, and 20) measure religion; two items (21 and 22) measure habits; and two items (23 and 24) measure parents' customs regarding the HPV vaccine. All items are coded on a three-level Likert-type scale as follows: Agree (3), Indifferent (2), and Disagree (1). These items were scored reversely.

Statistics

Data processing and analysis was performed using the SPSS v.25 statistical package. The reliability of the instrument was based on the analysis of the internal consistency of the Cronbach's alpha coefficient α=0.90 (Tuapanta et al., 2017). The instrument-questionnaire was validated by expert judgment, considering four experts, under strict review, using the coefficient of content validity, CVC = 0.92 (Pedrosa et al., 2014).

Subsequently, the calculation of the cross tables was performed. For the normality test, the Kolmogorov-Smirnov asymmetry tests were applied. In this case, the data did not meet the normality parameters, so the Spearman Rho correlation test (ρ) was used to examine the associations between the study variables (Apaza et al., 2022). Finally, the variables were recategorized and graded, applying the interval width to demonstrate the degree of influence on the acceptance of the HPV vaccine and classifying it into the following categories: High degree of influence, medium degree of influence, and low degree of influence, as appropriate.

$$\boldsymbol{\rho = 1 - \frac{6\sum d^2}{n(n^2 - 1)}}$$

Ethical considerations

The instrument/questionnaire applied to each parent of girls and boys has incorporated the commitment to maintain the anonymity of the data provided by the participants, both in the processing and in the dissemination of the results of the research, which constitutes an ethical and responsible exercise in data management. In addition, all participants in the study gave their informed consent in writing.

Results

Since the study seeks to measure the association between psycho-sociocultural factors and the attitude of parents of girls and boys regarding the acceptance or rejection of the HPV vaccine, and as part of the social determinants of health, it is relevant to refer to some characteristics of the population studied that

could have conditioned the results of the study. In this sense, in Table 1, it is observed that 61.6% of respondents are in the range of 30 to 40 years of age; In addition, 54.5% of those who have participated in the study are women/mothers of girls and boys. These sociodemographic characteristics, although they have not been explicitly considered in the study, would have had a transversal impact on the behavior of the data, referring to psycho-sociocultural factors.

Table 1. Population studied by age groups and sex

Age groups	N°	%
From 20 to 30 years	18	18,2
From 30 to 40 years	61	61,6
From 40 to 50 years	17	17,2
From 50 onwards	3	3,0
Total	99	100,0
Sex	N°	%
Female	54	54,5
Male	45	45,5
Total	99	100,0

Note: N°, number/frequency; %, percentages.

Psychological factors and attitude of parents

Psychological factors such as perceptions, fear, and anxiety in parents have a significant impact on their attitude to accept or reject the administration of the HPV vaccine to their daughters/sons. This situation is explicitly reflected in Table 2, where 42.4% of parents have a high degree of influence of psychological factors to reject the vaccine, and if we add the 15.2%, who have a medium degree of influence of psychological factors; Then, 57.6% of parents tended to reject the HPV vaccine. Because the majority consider that their daughter/son is too young to be vaccinated against HPV, or they are afraid that receiving the vaccine will produce harmful effects on the health of their daughters/sons; Therefore, they are uncomfortable just thinking about having the HPV vaccine.

Table 2. Psychological factors according to parents' attitude towards the HPV vaccine (in percentages)

Attitude	Psychological factors			Total
	High degree of psychological influence	Medium degree of psychological influence	Low degree of psychological influence	
Agreed	0,0	0,0	36,4	36,4
Indifferent	0,0	5,0	1,0	6,0
Disagreed	42,4	15,2	0,0	57,6
Total	42,4	20,2	37,4	100,0

Social factors and attitude of parents

Regarding social factors, the trend in the behavior of the actors in this dimension is similar to the previous one, in the sense that social aspects such as educational level and knowledge about the HPV vaccine strongly influence the attitude of acceptance or rejection of the vaccine by parents. Thus, in Table 3, 46.5% of the respondents said that having a high degree of influence from social factors, they reject the HPV vaccine, and adding the 11.1% of parents who report having a moderate influence from social factors, they also reject the vaccine. That is, to the extent that the respondents expressed having a lower educational level, they tended to reject the vaccine and vice versa. Similarly, it occurred with the information and knowledge they have regarding HPV and the disease it causes; That is, 63.6% of the parents were unaware of HPV and 50.5% were unaware of the disease that HPV causes.

Table 3. Social factors according to parents' attitude towards the HPV vaccine (in percentages)

Attitude	Social factors			Total
	High degree of social influence	Medium degree of social influence	Low degree of social influence	
Agreed	1,0	17,2	18,2	36,4
Indifferent	2,0	4,0	0,0	6,1
Disagreed	46,5	11,1	0,0	57,6
Total	49,5	32,3	18,2	100,0

Cultural factors and attitude of parents

The cultural context is another important factor that strongly influences the attitude of parents when deciding to accept or reject the HPV vaccine. That is, beliefs, customs, and even religion, are aspects or elements that significantly affect the behavior of those surveyed. Because, according to Table 4, although the data has been slightly reduced compared to the two previous dimensions, however, the trend remains the same, that is, adding the high and medium degree of influence of cultural factors on the attitude of those surveyed, 56.6% tend to reject the HPV vaccine. Because there is a belief that, with the vaccine, children are intended to be harmed both physically and mentally, or it is believed that God decides on people's health, and that in the family traditional medicine is preferred over clinical medicine.

Table 4. Cultural factors according to parents' attitude towards the HPV vaccine (in percentages)

Attitude	Cultural factors			Total
	High degree of cultural influence	Medium degree of cultural influence	Low degree of cultural influence	
Agreed	0,0	0,0	36,4	36,4
Indifferent	0,0	5,0	1,0	6,0
Disagreed	40,4	16,2	1,0	57,6
Total	40,4	21,2	38,4	100,0

Now, regarding the degree of statistical correlation between the variables studied, according to Table 5, it has been verified that there is a strong correlation between psychological, social, and cultural factors with the attitude of parents/mothers toward the HPV vaccine, because the p-value is 0.000 in the three dimensions, being $< \alpha = 0.01$. Regarding the direction and intensity of the relationship between the variables, psychological and cultural factors with attitude have a very high negative correlation, which means that the values of the psychological and cultural variables tend to increase to a greater extent concerning the value of the variable attitude of parents/mothers towards the HPV vaccine. Meanwhile, social factors and attitude have a high positive correlation, indicating that the values of both variables increase simultaneously.

Table 5. Degree of assessment of psycho-sociocultural factors and the attitude of parents towards the HPV vaccine.

			Attitude
Rho Spearman	Psychological Factors	Correlation coefficient	-0,915**
		Sig. (bilateral)	0,000
		N	99
	Social Factors	Correlation coefficient	0,792**
		Sig. (bilateral)	0,000
		N	99

	Cultural Factors	Correlation coefficient	-0,894**
		Sig. (bilateral)	0,000
		N	99

Note: N, census sample size

Discussion

As far as we have information, there are no serious studies in the field of research on the problem of unwillingness and rejection of the HPV vaccine in parents of girls and boys aged 9 to 13 years, who are due for the doses of that vaccine. In some cases, although they start with the first dose, they fail to complete the series (Mansfield et al., 2022; MINSA, 2024). Precisely, with this research we have sought to address the problem from a multidimensional and transversal approach, considering three axes or variables that, to a large extent, encompass several of the social determinants of health, within the framework of primary health care (Quispe-Mamani et al., 2022). In this case, the hypothesis has been proposed that psycho-sociocultural factors have a direct correlation with the attitude of parents of girls and boys towards the HPV vaccine. Our results have been produced in coherence with what has been proposed.

Psychological factors, referring to both emotional and cognitive aspects (García, 2021; Ovares, 2018) have an impact in one way or another on the attitude of parents to adopt or not the HPV vaccine. Thus, the majority of respondents (57.6%), who are influenced by the psychological dimension, tend to reject the vaccine, because they consider that their daughter/son is too young to be vaccinated against HPV, or they are afraid that receiving the vaccine will have harmful effects on the health of their daughters/sons; Therefore, they are uncomfortable just thinking about the application of the HPV vaccine. This tendency is corroborated by the degree of statistical correlation of Spearman's Rho, according to which, the p-value is 0.000, being $< \alpha = 0.01$ and the correlation coefficient is -0.915 (see Table 5); That is, psychological factors and attitude have a very high negative correlation, showing that the psychological dimension is superimposed on the attitude of parents to reject the HPV vaccine.

Regarding the above, several investigations have reported that psychological aspects, referring to perceptions such as the young age of daughters/sons to be vaccinated (Bair et al., 2008; Mansfield et al., 2022), the fears that parents have that receiving the vaccine will produce side effects on the health of their daughters/sons (Chaparro et al., 2016; Chaupis-Zevallos et al., 2020; Coyne-Beasley & Ortiz, 2023; Dera et al., 2023; Kurani et al., 2022; Millán-Morales et al., 2019; Pei-Yun et al., 2024; Ramírez et al., 2014) and the anxiety expressed in the discomfort caused by the mere thought of applying the HPV vaccine (Dera et al., 2023; Mansfield et al., 2022), constitute determinants that prevent the application of the aforementioned vaccine.

On the other hand, the social factors that influence human attitude are those related to education and knowledge. That is, to the extent that people have those resources, they will have greater confidence and assertiveness when making decisions and choosing a course of action (Barzaga et al., 2019; Cobo, 2003; Moreno & Marcaccio, 2014). As a result of the study, 51.4% of parents with basic and technical education levels reject the application of the HPV vaccine, while 24.2% of respondents with higher university and postgraduate education levels accept the application of the vaccine. That is, to the extent that respondents expressed having a lower educational level, they tended to reject the vaccine and vice versa. Likewise, 63.6% of parents were unaware of HPV and 50.5% were unaware of the disease that HPV would cause, consequently, all of them rejected the HPV vaccine. Meanwhile, 52.5% of parents who knew about the usefulness of the HPV vaccine accepted the application of said vaccine to their daughters/sons. This association between the variables studied is corroborated by the degree of statistical correlation of Spearman's Rho, according to which, the p-value is 0.000, being $< \alpha = 0.01$ and the correlation coefficient is 0.792 (see Table 5); that is, social factors and attitude have a high positive correlation, showing that the values of both variables increase simultaneously.

Research on social factors associated with the acceptance or rejection of the HPV vaccine argues that the educational level of parent's conditions their attitude to accept the vaccine; that is, consistent with the results of this study, to the extent that the educational level of the parents is high, then the tendency to adopt the HPV vaccine is also high (Dera et al., 2023; Garga et al., 2022; Ramírez et al., 2014). Likewise, to the extent that parents are unaware of the nature of HPV and its consequences on the health of girls and adolescents, the attitude of rejection towards the vaccine is high, and the scenario

is reversed if more information and knowledge about HPV is available (Bair et al., 2008; Brandt et al., 2022; Kurani et al., 2022; Montalti et al., 2024; Sánchez-Mendoza et al., 2023).

Finally, cultural factors determine a person's attitude towards a phenomenon, establishing rewards for those who adopt and practice them, and sanctions for those who rebel (Cobo, 2003; Lattanzi, 2019). This cultural dynamic is manifested in the emotions, thoughts, and actions of people in certain social situations, in this case, in relation to the HPV vaccine. Because 56.6% of parents with medium and high degree of influence of cultural factors, such as beliefs, religion, customs, and habits tend to reject the HPV vaccine. That is, to the extent that there is a belief that, with the vaccine, children are intended to be harmed both physically and mentally (52.5%), or it is believed that God decides on people's health (53.5%), that in the family there is a custom of not receiving vaccines, but they feel in good health (47.5%), and that in the family traditional medicine is preferred over clinical medicine (56.6%); Thus, all these cultural aspects determined the attitude of parents to reject the HPV vaccine. This logic of data behavior is consistent with the results of the Spearman Rho statistical test, according to which the p-value is 0.000, being $< \alpha = 0.01$ and the correlation coefficient is -0.894 (see Table 5); that is, cultural factors and attitude have a very high negative correlation, showing that the value of the cultural variable overlaps the value of the attitude variable, in its increase.

Research on cultural factors associated with the acceptance or rejection of the HPV vaccine maintains that the belief in the negative intentions of the vaccine, morality, and religiosity, influence the attitude of parents/mothers to adopt the HPV vaccine; although the indicators regarding culture are variable by context, they nevertheless have an important impact on the attitude towards the adoption of the HPV vaccine (Bair et al., 2008; Chaupis-Zevallos et al., 2020). Beyond previous studies, this research has shown that the cultural variable expressed in beliefs, religion, customs, and habits, were strongly associated with the attitude of parents/mothers to reject the HPV vaccine; corroborating the theory that emotions, thoughts, and actions of people depend on the culture in which one develops (Cobo Olivero, 2003; Lattanzi, 2019).

Limitations and strengths of the study

The main limitation of our study lies in the population size and the census-type sample with which we have worked. Although the total population of parents of girls/boys to be studied in a Public Educational Institution has been considered; however, for the purposes of replicability of the research results, it is recommended to expand the coverage; in addition, in a complementary manner, for the purposes of a greater comprehensiveness of the results, an approach from a mixed research methodological approach is recommended. Another limitation of the research is that some sociodemographic variables, such as sex, age, economic income, and others, have not been directly considered in the analyses, which according to Montalti et al. (2024) and Ramírez et al. (2014) could have conditioned the attitude of parents/mothers regarding the acceptance or rejection of the HPV vaccine.

The main strength of the study lies in the internal and external coherence and consistency of the variables analyzed, precisely, by the method applied in the design and elaboration of the data collection instrument based on the Likert-type scale (Toro et al., 2022). The high reliability of the instrument has been based on the analysis of the internal consistency of the Cronbach alpha coefficient (Tuapanta et al., 2017) and the high degree of validity of the instrument has been carried out through the strict judgment of experts, based on the coefficient of content validity (Pedrosa et al., 2014). In addition, considering that the level of depth of the study is correlational, the sense and the degree of association between the variables studied have been coherent and consistent. Therefore, the results of the research constitute the basis for the development of studies based on an experimental design, in similar cases or areas, or of greater coverage.

Conclusions

On the one hand, it is argued that psychological factors, such as perceptions, fear, and anxiety, significantly affect the attitude of parents to reject the administration of the HPV vaccine to their children. This finding means that both the emotional dimension (moods, emotions, and feelings) and the cognitive dimension (beliefs, thoughts, and expectations) of the psychological variable have been strongly and significantly correlated with the attitude of parents regarding the rejection of the HPV vaccine.

On the other hand, regarding social factors, to the extent that parents have a low level of education, they tend to reject the HPV vaccine and vice versa. Similarly, those who are unaware of HPV and the disease it causes, reject the HPV vaccine and vice versa. In this way, it is argued that education and the possession of information and knowledge regarding the HPV vaccine are resources that contribute to the generation of greater confidence and assertiveness when making decisions and choosing a course of action.

Regarding cultural factors, parents' attitude of rejection towards the HPV vaccine is closely related to beliefs, religion, customs, and habits. This finding shows that culture, expressed in emotions, thoughts, and actions, sets the stage for making the decision to reject the HPV vaccine.

Finally, since psycho-sociocultural factors are closely correlated with parents' attitudes towards the HPV vaccine, it is important and necessary to adopt the principles and values of primary health care, based on health promotion and prevention. That is, the prevention of cervical cancer requires the adoption and implementation of public reproductive health policies from an early age, incorporating psycho-sociocultural determinants transversally, where the family and the educational system are the entities and agents of change in attitudes to achieve the goals of completing the series of HPV vaccination doses at local, regional and national levels.

Acknowledgments
We would like to thank the parents who participated in the research; we also express our gratitude to the Public Educational Institution of the Province of Yunguyo, and to the master's in public health, Graduate School of the National University of Altiplano Puno.

Author contributions
Conceptualization, S.L.O.-G. and E.Q.-M.; methodology, S.L.O.-G. and E.Q.-M.; software, S.L.O.-G. and E.Q.-M.; validation, S.L.O.-G.; formal analysis, S.L.O.-G. and E.Q.-M.; investigation, S.L.O.-G. and E.Q.-M.; resources, S.L.O.-G. and E.Q.-M.; data curation, S.L.O.-G. and E.Q.-M.; writing—preparation of original draft, S.L.O.-G. and E.Q.-M.; writing—review and editing, S.L.O.-G. and E.Q.-M.; visualization, S.L.O.-G. and E.Q.-M.; supervision, S.L.O.-G. and E.Q.-M.; project administration, E.Q.-M. Both authors have read and accepted the published version of the manuscript.

Funding
No external funding was received for this research.

Institutional Review Board Statement
Considering the Declaration of Helsinki, the study has been developed under the Research Ethics Certificate, granted by the Directorate of Research Institutes of the National University of Altiplano Puno, Peru. Certificate granted on February 3, 2023.

Informed consent statement
Informed consent was obtained from all subjects involved in the study.

Conflicts of interest
The authors of the study declare that they have no conflict of interest.

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