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Impact of personality traits on prosthodontic patients

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Determining oral health-related quality of life in elderly patients with removable prostheses who have increased difficulty in reporting oral issues is imperative for a successful rehabilitation. **Aim:** Our objective is to assess the extent to which a trace, or personality dimension, can influence oral health-related quality of life (OHRQoL) in rehabilitated patients. **Methods:** 135 participants rehabilitated with removable prosthesis were evaluated in the Clinical Unit of Removable Prosthodontics of the Faculty of Dental Medicine of Porto University, Portugal. The Oral Health Impact Profile (OHIP-14) questionnaire was applied to evaluate oral health-related quality of life, along with the Eysenck Personality Inventory (E.P.I.) to determine a personality trait. Statistical analysis was carried out using Mann-Whitney, Student's t-test, Spearman's rho and linear regression. **Results:** No statistical correlation was found concerning age, gender and oral health-related quality of life. Regarding the latter, the highest agreement was found on the question involving "pain in teeth". The prevalence of acrylic partial dentures, as opposed to partial dentures with metallic framework, was substantially higher. No significant association between both extraversion/neuroticism (E.P.I.) and oral health-related quality of life (OHIP-14) upon rehabilitation with removable prostheses was found (p>0,05). In our study, personality traits neuroticism and extraversion did not influence oral health-related quality of life with removable prostheses. However, we should not overlook the importance of other psychological factors (such as motivation or perception) and their role in determining oral health-related quality of life. **Conclusion:** Personality traits "extraversion" and "neuroticism" did not influence oral health-related quality of life.

Keywords: Oral health. Quality of life. Aged. Dental prosthesis. Personality assessment.

Introduction

Health-care responsibility involves more than the mastery of technical skills[1]. In this sense, the field of psychology should be seen as a vast source of knowledge for current dentistry practice. Presently, specific guidelines defined by the Association for Dental Education in Europe stress out the importance of developing a particular set of psychological skills to further improve doctor-patient relationship.

Accordingly, some researchers[2-4] have been trying to investigate the association between certain psychological traits and oral health-related quality of life (OHRQoL). Roughly 80 years ago, M. House[5,6] devised a revolutionary psychological assessment tool for dentists, thus linking psychology and dentistry for the first time. It consisted of four levels or "mental attitudes": philosophical, exacting, hysterical, and indifferent minds. According to him, patients should be classified before prosthetic rehabilitation to guide dentists in their diagnosis and treatment plan. His ideas were drafted by predicting the adaptive response of aging patients to the daily use of complete removable prostheses[7].

In psychology, there has been a long tradition of studying the concept of personality[8-9]. One of the best approaches to the comprehensive study of human personality is the "Big Five Personality Traits" theory. Researchers supporting this theory measure trends, which may be defined as "normal patterns of behavior, thought, and emotion"[10]. For Allport[11], the basic unit of personality is a "trait." The sum of individual traits provides a detailed notion of a person's personality. Eysenck[12] and Catell[13] added that personality traits are reasonably stable over time, differ from one individual to another, and influence their behavior. Moreover, they tend to evolve with experience and adaptive responses to the environment.

Within this field of expertise, researchers[14] from different schools of thought have studied several personality dimensions, resulting in a remarkable convergence of ideas. Although some scientific terminology may differ, five personality traits have been consistently pointed out. Some authors propose that these five traits are an integral part of the "Ocean of Human Personality" and are often considered the essential traits upon which all other aspects of personality fall. This theory is also called "Personality Traits Theory" or "Five-factor model," and includes five "factors": Openness to Experience; Conscientiousness; Extraversion-Introversion; Agreeableness and Neuroticism-Emotional Stability. Among these, the traits Extraversion-Introversion and Neuroticism-Emotional Stability are perceived as central dimensions in human personality. Both are recognized as a continuum belonging to opposite poles, thus taking on paramount importance in the study of human behavior.

In line with the aforementioned, upon oral rehabilitation, when trying to assess the vast complexity of individual responses, it becomes imperative to assess personality in a clinical setting. Over the years, different authors have been building a bridge between psychology and OHRQoL. Some[15] have found a significant relationship between patients' personality and emotional responses to new dentures, while others[16] have concluded that patients with higher neuroticism scores have a greater tendency to complain due to prosthetic errors. Nevertheless, although psychological

variables play a significant role in rehabilitation, prosthetic faults may also be responsible for acceptance[17]. More recently, researchers[18] have highlighted that personality accounted for around 38% of functional limitation.

Since research involving oral health in the elderly is quite scarce in Portugal, the authors saw fit to conduct further research on the topic. So being, this study has two major aims:

1. Understand the impact of removable prostheses (including dentures) in oral health-related quality of life;

2. Analyze the relationship between personality and oral health-related quality of life upon removable prosthesis rehabilitation.

Materials and methods

This research was accepted and followed by the FMDUP Ethics Committee, assuring confidentiality in data processing and complete privacy of all recorded information. All participants were examined in the Faculty of Dental Medicine of the University of Porto Clinic (FMDUP). Before the study, all participants were asked to sign informed consent forms. Participants with sensory impairments (blindness, deafness, hearing impairment) and illiterates were excluded from this study. Also, only complete surveys were accepted. No dropouts or non-responders were reported. The institutional sample accurately represents its target population.

Two types of removable prosthesis were included in this study: acrylic dentures (partial and complete) and partial dentures with metallic framework. All prostheses were produced at FMDUP. Variables related to prostheses quality or anatomical factors (such as alveolar ridge or jaw morphology) were not assessed.

To determine OHRQoL, we applied the Oral Health Impact Profile questionnaire (OHIP-14), which measures the acceptance of dentures by assessing quality of life. The scoring is obtained by employing a Likert scale and features five different response categories ranging from 1 (strongly disagree) to 5 (strongly agree). The OHIP-14 is an accurate and reliable instrument, validated for the American[19], Spanish[20], and Brazilian[21] populations. It has also been employed in several other studies.

Personality traits were assessed by using the Eysenck Personality Inventory (EPI) to measure Neuroticism-Emotional Stability and Extraversion-Introversion. To simplify, the dimension Neuroticism-Emotional Stability will be simply addressed as "Neuroticism" whereas Extraversion-Introversion will be addressed as "Extraversion." Since personality is virtually impossible to be measured, it must first be broken down into its prime elements. Hence, an individual can be either considered an introvert with low neuroticism, or an introvert with high neuroticism (same for extraversion).

In short, EPI is a trustworthy instrument with two variants – A and B – validated for the Portuguese language and population[22]. Form B was chosen due to the nature of the questions, which are far more suitable for the elderly.

Prior to the testing, we employed a short screening to inquire about gender, age, type and use of dental prostheses.

Statistical analysis was carried out with the SPSS® v.23.0 (Statistical Package for the Social Sciences) software. Appropriate descriptive statistics were also employed, namely, the Mann-Whitney test, Student's t-test, as well as the linear regression method. Spearman's rho was employed to correlate OHIP-14 scores and age. Categorical variables were described through absolute and relative frequencies (in percentage), age (in years) and depending on their distribution. Continuous variables were described using average, median, standard deviation, P05 (5^{th} percentile) and P95 (95^{th} percentile). Values were recorded as absolute and relative frequencies (%). The independent variable was age. In all hypotheses, a significance level of 0.05 was considered.

The null hypothesis was the following: "there is no correlation between personality and OHRQoL".

Results

Our sample consisted of one hundred thirty-five participants with removable prostheses, of which 68 (50.4%) were males and 67 (49.6%) females. 62.5% of the study subjects had a single denture, while 37.5% had both dentures.

The sample was split into two separate groups according to their age reference: 61 (45%) nonelderly participants (<65) and 74 (55%) elderly participants (≥65) [age range between 40 and 86yo; ($_x$)=64; ($_s$)=11].

A total of 228 removable prostheses were assessed: 64 skeletal prostheses, 118 acrylic prostheses, and 46 complete dentures.

In our sample, acrylic prostheses were substantially more prevalent than metallic framework (skeletal) prostheses (Fig. 1). No statistical correlation was conducted between type of prosthesis and OHIP-14 test results.

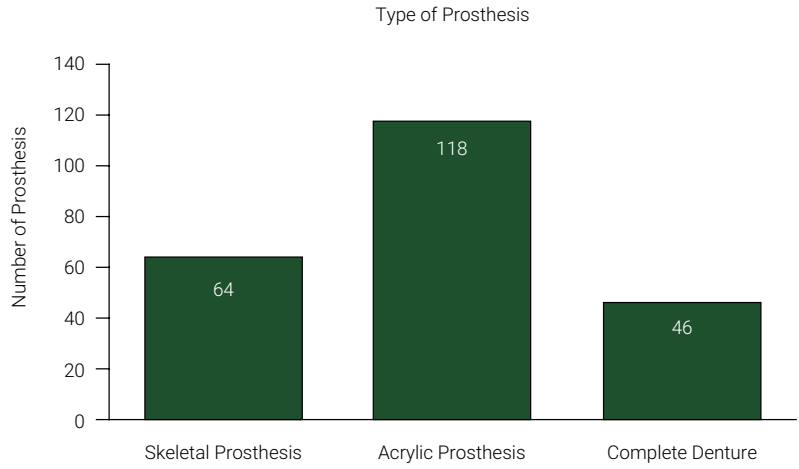


Figure 1. Types of prosthesis.

For the purpose of this study, "continuous use," or "daily wear," is defined as the act of wearing a removable prosthesis typically either during the whole day or during day

and night-time. On the other hand, "intermittent use" is defined as the act of wearing a removable prosthesis during short intervals of time (minutes to hours) and only during specific tasks (such as eating or public speaking). A considerable amount of patients acknowledged using prostheses continuously rather than intermittently (Fig. 2).

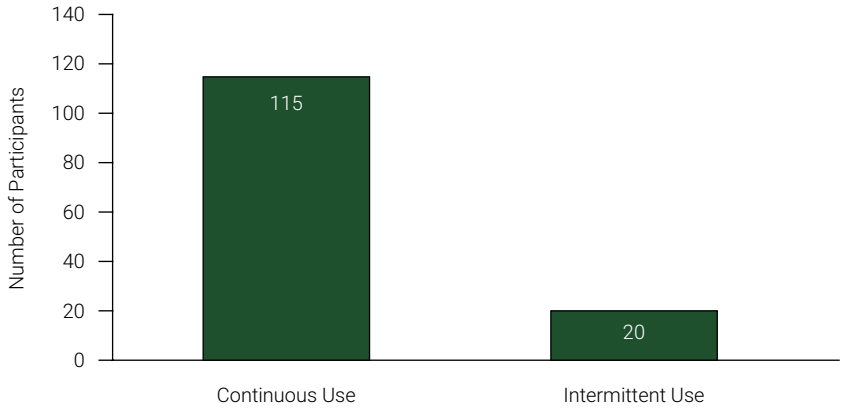
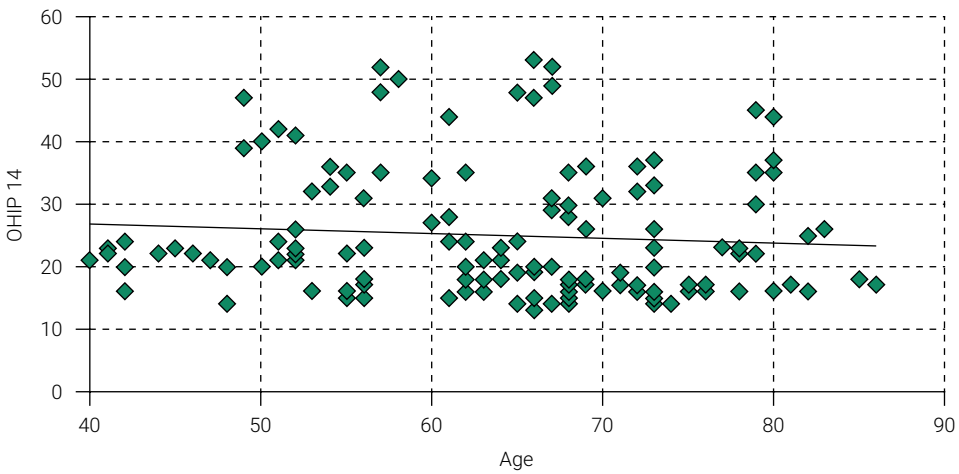


Figure 2. Prosthetics use.

The OHIP-14 test results (Fig. 3) showed no association with age (p>0.05).



A very slight relationship was observed between the OHIP-14 test results and gender (p=0.297) as females generally obtained higher results than males (average of 26.1 versus 24.0 "negative points," in a total of 70). Please note that higher scores in this test indicate less OHRQoL.

Figure 3. Relationship between age and OHIP-14 test results after applying the linear regression method (univariable linear regression model for each result).

Regarding the OHRQoL index (OHIP-14), each answer was registered on a Likert scale (minimum score of 1 and maximum of 5) (Fig. 4).

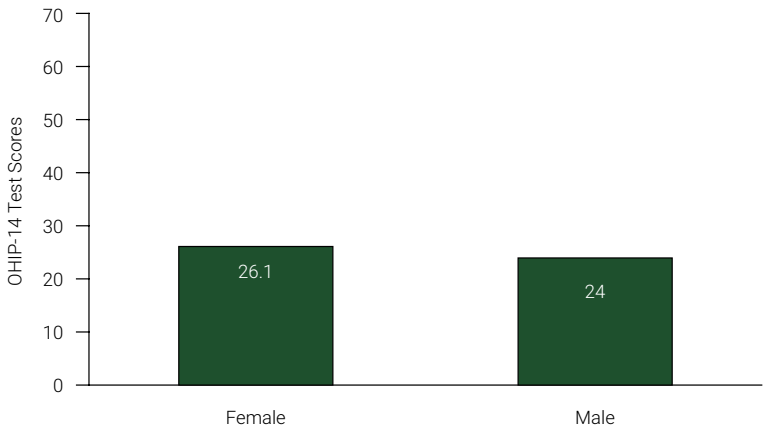


Figure 4. Relationship between gender and OHIP-14 test scores.

The OHIP-14 test consists of 14 questions (maximum total score of 70). Since all OHIP-14 questions deal with negative experiences, a virtual score of 70 would imply the lowest OHRQoL recorded, as well as an extremely unsatisfied patient.

On average, the question with the highest agreement was number 3: "Have you had painful aching in your mouth?". Conversely, the least agreed question was number 14: "Have you been unable to complete any daily chores?" (Fig. 5).

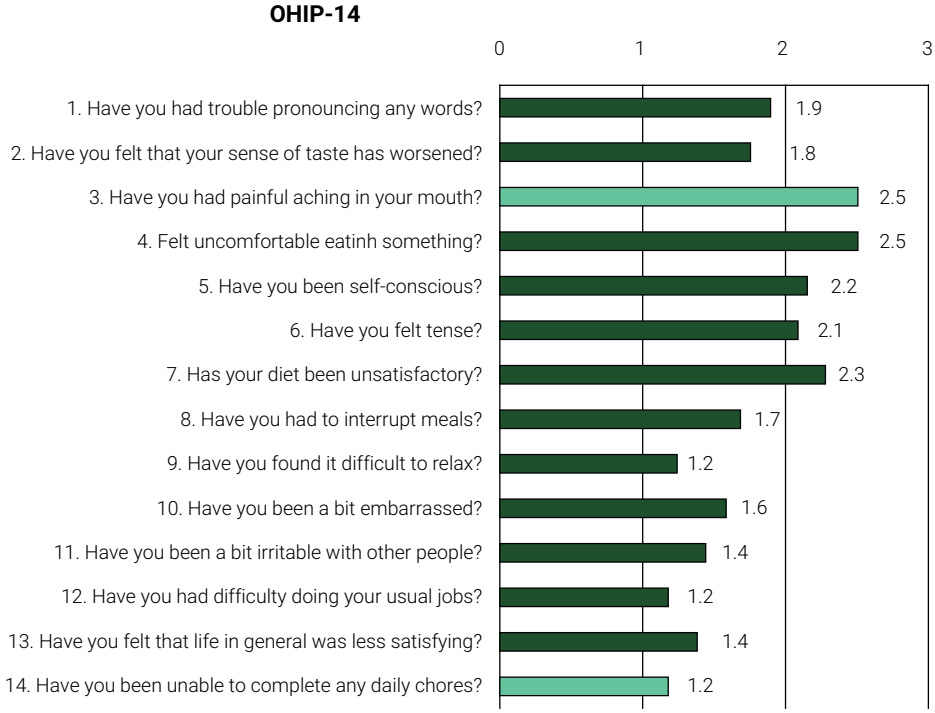


Figure 5. Mean agreement of each OHIP-14 question (total of 14 questions). The maximum score per question is 5. Higher scores indicate less OHRQoL (1 - Strongly Disagree / 5 - Strongly Agree).

The OHIP-14 test scores were obtained by summing the total points scored by each participant on all 14 questions (Likert scale). For the personality inventory (EPI), each participant was scored by summing their extraversion and neuroticism levels into two distinct table charts. The OHIP-14 test scores were then overlapped with the EPI ones to study their association (Fig. 6 and 7).

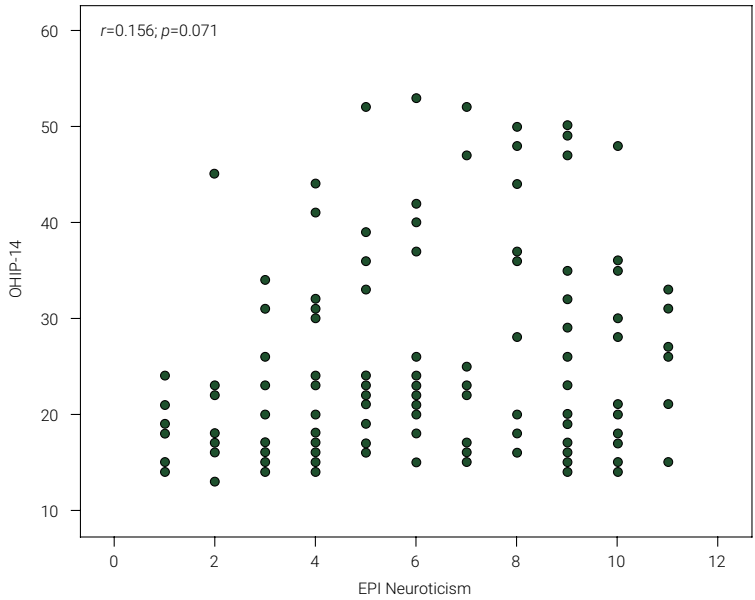


Figure 6. Ratio between Neuroticism and OHIP-14 test results (r=0.156; *p*=0.071).

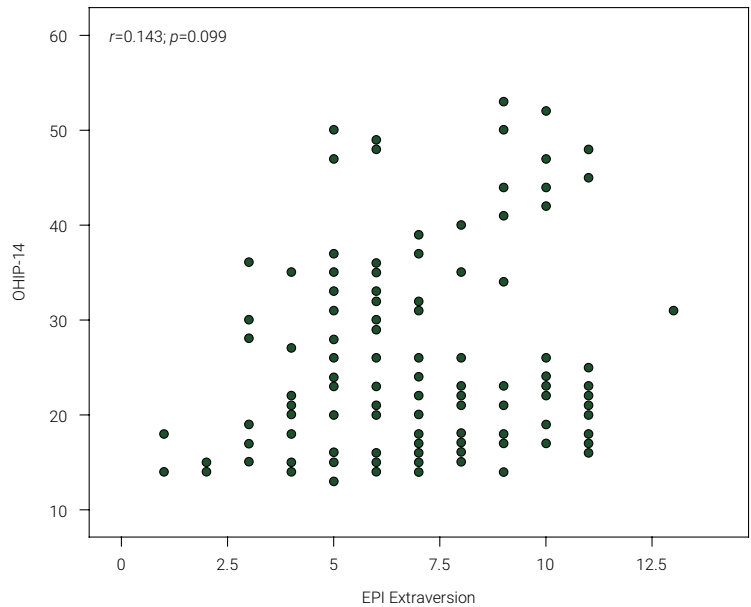


Figure 7. Ratio between Extraversion and OHIP-14 test results (r=0.143; *p*=0.099).

No linear correlation was found between EPI neuroticism and OHIP-14 (r = 0.156; *p* = 0.071), or between EPI extraversion and OHIP-14 (r = 0.143; *p* = 0.099) (Table 1).

Table 1. Spearman's rho between all scores and age (n=135).

		OHIP-14	EPI Neuroticism	EPI Extraversion	EPI N+E	Age
OHIP-14	rho	1.000	**0.156**	**0.143**	0.282	-0.148
	p	-	**0.071**	**0.099**	0.001	0.087
EPI Neuroticism	rho	**0.156**	1.000	-0.350**	0.648	0.012
	p	**0.071**		<0.001	<0.001	0.891
EPI Extraversion	rho	**0.143**	-0.350**	1.000	0.456	0.033
	p	**0.099**	<0.001		<0.001	0.707
EPI N+E	rho	0.282**	0.648**	0.456**	1.000	0.020
	p	0.001	<0.001	<0.001		0.818
Age	rho	-0.148	0.012	0.033	0.020	1.000
	p	0.087	0.891	0.707	0.818	

Discussion

Relationship between Aging and oral health-related quality of life (OHRQoL) is currently a fast-growing notion.

In the field of dentistry, the concept of OHRQoL is particularly significant within three distinct areas: clinical practice, dental research, and dental education[23].

When applied to the field of prosthodontics, OHRQoL can roughly be defined as the acceptance or rejection of a given prosthesis.

Our study had two major goals. The first involved understanding the impact of oral rehabilitation on OHRQoL in both gender and age. The second, analyzing the impact of personality in OHRQoL.

Upon statistical analysis the authors, alongside Smith[17], Berg et al.[24] and Smith and Hughes[25], found that quality of life was not influenced by gender or age.

Also, no association between personality traits and OHRQoL (while using prosthesis) was found, meaning that neither neuroticism nor extraversion is associated with OHRQoL. These findings suggest that personality does not affect the overall success of removable prosthesis rehabilitation.

According to recent scientific discoveries in the field of psychology, M. House's classification has been considered obsolete. A few authors have pointed it out by stating that personality is far more lasting and stable than a given "mental attitude," as was repeated by Gamer et al.[26].

Even more recently, some efforts have been made to investigate the association between personality and the acceptance of removable prostheses. However, most

investigations are conflicting since several authors[27] have found an inverse relationship between neuroticism and OHRQoL (higher neuroticism levels with less OHRQoL), while others[28] refute it. Interestingly, studies highlighting such association had larger samples than those with no association.

The institutional sample in this study is similar, in size, to that of Sobolik and Larson[15], but yielded different results. On the other hand, our results are consistent with those of Smith[17], Berg et al.[24] and Smith and Hughes[25]. Bolender et al.[28] also found no association between personality and post-insertion control sessions.

A few studies have reported that three months after a removable prosthesis rehabilitation, personality becomes the dominant factor, as was later confirmed by Klages et al.[18]. According to these authors, a three months adaptation period is a mandatory step for personality to set in. Hereupon, even though some studies focus on the acceptance of removable prostheses, there is still little research linking it with psychological variables.

In addition, although support for the "Big Five Personality Traits" theory is quite robust, it is still unclear whether or not these five traits are the best possible measure of personality for all cultures. Accordingly, some researchers have stressed out that essential aspects of certain societies are not embraced by this theory. We believe that cultural assessment of multiple personality types is hard to carry out since each country, or region, has its underlying characteristics and intrinsic values. Thus, trying to predict a behavior pattern based solely on personality attributes may lead to misleading conclusions because, despite some similarities in personality traits between cultures, differences always arise. Thus, it may be productive to think of this particular model as a framework to begin exploring differences between cultures.

Present day findings suggest that patients' satisfaction with their oral condition following a removable prosthetic rehabilitation improves if certain conditions are met, such as motivation, conscientiousness, openness, among others. It is also important to provide a detailed explanation of issues that might arise by providing small tips about the daily use and maintenance of their prosthesis.

The psychological impact of oral diseases on our daily life has taken on critical significance over the last few years. In the field of dentistry, whether by providing valuable information, whether by predicting the outcome of current treatments, psychological factors play an important role and must never be overlooked. Therefore, OHRQoL should be further investigated.

The authors encourage further studies in this field, particularly to assess the influence of the factor "time" and subsequent adaptive behavior of patients to a removable prosthesis.

In our study, there was no significant association between personality traits and oral health-related quality of life. Also personality traits "extraversion" and "neuroticism" did not influence oral health-related quality of life upon rehabilitation with removable prostheses. In the OHIP-14 assessment profile, "pain in teeth" was reported as the most prevalent, implicating less oral health-related quality of life (OHRQoL) whenever dental pain occurs. The results suggest no statistical meaning between the stated variables, therefore implying the acceptance of the null hypothesis.

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Ethical approval: All procedures involving human participants were in accordance with the ethical standards of the institutional committee, as well as with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all participants included in this study, in full accordance with all current ethical principles.

Conflict of interest: The authors declare they have no conflict of interest. No personal gain was sought by either researchers or participants.

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