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A machine learning approach for analyzing sexual satisfaction based on psychological features

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Abstract

The emergence of machine learning techniques has revolutionized various fields, helping to shed light into the complexities of human sexuality and address sexuality-related problems. The present study aimed to classify sexual satisfaction in both women ($n = 503$) and men ($n = 342$), who completed a digital survey aimed at Colombian adults based on a *snowball* sampling. Collected data were analyzed using several supervised learning algorithms where inputs included marital status, sociosexuality, sexual drive, sexual functioning, and personality traits. The results showed that the XGBoost model provided best classification results for sexual satisfaction in women, while the Artificial Neural Networks (ANN) had the best performance in classifying sexual satisfaction in men. In both groups, sexual functioning and sexual drive were the most significant predictors of sexual satisfaction. Traits such as extraversion, narcissism, machiavellianism, and sociosexual behavior had a lesser importance. Lastly, psychopathy emerged as a significant predictor of men's sexual satisfaction, whereas conscientiousness emerged as a significant predictor of women's satisfaction. This study provides a technological tool to classify sexual satisfaction using Machine Learning models, in addition, provide, in terms of entropy, variables with the greatest influence based on the data and predictions.

Keywords Supervised learning · Sexual satisfaction · Sexual functioning · Personality · Dark Triad

Introduction

Machine Learning Models (MLMs) have been widely used in different fields of engineering and science with positive results (Karpatne et al., 2018; Reich & Barai, 1999; Zhong et al., 2021). These models have demonstrated remarkable capabilities to solve problems related with digital image processing, natural language processing, financial prediction, among others (Fischer & Krauss, 2018; Lundervold & Lundervold, 2019; Otter et al., 2020). The emergence of machine learning techniques has revolutionized various fields, including shedding light on the complexities of human sexuality, and helping to address sexuality-related problems. For example, studies have already implemented machine learning techniques to identify user satisfaction with dating apps (Vera et al., 2023), detect sexual harassment (Alawneh et al., 2021), and sexual grooming (Ngejane et al., 2018), forecast future sexual behaviors in HIV-positive patients (Andresen et al., 2022), predict sexual desire (Vowels et al., 2021), or predict potential extradyadic behaviors between romantic partners (Vowels et al., 2022a, 2022b). It is imperative to implement machine learning algorithms to attain a deeper understanding of certain issues, such as sexual satisfaction, since these techniques allow to analyze large volumes of data and to identify patterns that traditional statistics would not be able to detect.

Research has demonstrated that sexual satisfaction can profoundly impact individuals' quality of life, influencing mental health outcomes (Abdollahi et al., 2021; Carcedo et al., 2020; Talayizadeh & Bakhtiyarpour, 2016). For instance, sexual satisfaction in adolescents has been correlated with lower levels of anxiety, and in young adults has been correlated with better psychological health and reduced levels of depression, particularly within the context of romantic relationships. The prevalence of low sexual satisfaction is higher among people diagnosed with depression, such that 63% of men and 82% of women report being sexually

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dissatisfied (Goncalves et al., 2023). Lack of sexual satisfaction can lead to tensions in interpersonal relationships, which can result in low marital adjustment (Çömez et al., 2020) and non-consensual extradyadic behavior (González-Rivera et al., 2019).

Communication, sexual functioning, and overall relationship satisfaction have been positively associated with sexual satisfaction, especially in individuals with a more restricted sociosexual orientation (i.e., less likely to engage in uncommitted sexual activities; Blunt-Vinti et al., 2019; Mallory, 2022; Peixoto et al., 2018). Likewise, romantic partners who openly communicate their desires, maintain emotional closeness, and feel secure within their marriage tend to experience higher levels of sexual satisfaction (Frederick et al., 2017). Marital status can also shape several sexual aspects, such as sexual intercourse frequency (Kislev, 2021; McNulty et al., 2016; Ueffing et al., 2020). Some studies found that people who have casual sex, less desire to marry, or who are more satisfied with singlehood, are more sexually satisfied with sexual intercourse (Fischer, 2023; Mark et al., 2015; Park et al., 2021, Park & MacDonald, 2022, Park et al., 2023). In the case of partnered people, regardless of gender, sexual satisfaction is mainly related to more intercourse frequency, contentment with sexual intercourse, satisfaction with the relationship, and less relationship duration (Fischer, 2023).

Using MLMs, Vowels and colleagues (2022a, 2022b) undertook an investigation aimed at predicting levels of sexual satisfaction within a participant cohort, predominantly comprised of cisgender females (62.5%) and individuals of Caucasian ethnicity (88.4%), with an average age of 31 years. The researchers identified relational commitment, sexual encounter regularity, sexual desire, and regular communication as the strongest predictors of sexual satisfaction. However, the authors exclusively employed the Random Forest Regressor for predictive modeling, eschewing a thorough examination of the algorithmic landscape to discern optimal performance in forecasting sexual satisfaction. The implementation of this regressor encompassed relational parameters as predictive variables, including contentment with the relationship, sexual desire, attitudes toward sexuality, perceptions of love, and attachment styles within partnerships.

Despite the breadth of predictors integrated by Vowels and colleagues (2022a) in their study, the inclusion of personality traits was also absent from the model design, which have been conspicuously associated of sexual dynamics through the literature (Allen & Walter, 2018; Khorshidi & DashtBozorgi, 2019; Pilch & Smolorz, 2019; Steininger & Pietschnig, 2022). For example, Jirjahn and Ottenbacher (2023) found several correlations between the big five domains and sexual satisfaction in a large sample of German individuals ($N > 12{,}000$). The authors found that individuals who scored higher on extraversion, conscientiousness, agreeableness, and openness reported more sexual satisfaction, whereas individuals who scored higher on neuroticism reported less sexual satisfaction. Moreover, individuals who score higher on dark triad traits often engage in sexual relationships that may not necessarily align with the partner's enjoyment, as they rely on sex to enhance their self-image, alleviate stress, exert power over the partner, and attain pleasure for themselves (Smith et al., 2019). Hence, it is not uncommon to observe an association between dark triad traits and sexual satisfaction. For instance, sexual satisfaction is higher when narcissism is associated with higher sexual self-esteem (Anzani et al., 2021), which also increase sexual assertiveness and sexual motivation, and reduces negative emotions in sex (Pilch & Smolorz, 2019; Steininger & Pietschnig, 2022). Similar results have been observed in samples higher on sub-clinical psychopathy, in which sexual motivation, self-esteem, and assertiveness are higher, but negative emotions in sex are low. In the case of people who score higher on machiavellianism, the sexual activity is different because this dark trait is related to higher sexual fear and anxiety, and lower sexual self-esteem and satisfaction (Pilch & Smolorz, 2019; Steininger & Pietschnig, 2022).

The present study

Based on this overview, the following research questions emerge: To what extent do different supervised learning algorithms accurately differentiate between cases of sexual satisfaction and those that are not? And how do psychological variables related to sexuality and personality provide information for making such distinctions?. The present study aims to classify sexual satisfaction in both women and men, based on the implementation of several supervised learning algorithms and using several inputs: marital status, sociosexuality, sexual drive, sexual functioning, and personality traits. Specifically, we used models such as Logistic Regression (LR), XGBoost, Random Forest (RF), Support Vector Machines (SVM) and Artificial Neural Networks (ANN) and compared their performance by classification score based on accuracy, sensibility and specificity to obtain the best classification model to predict sexual satisfaction.

Method

Procedure and sample

This study was reviewed and approved by the Ethics Committee of Universidad del Norte (no. 237/2021). Participants

had to be at least 18 years, live in Colombia, and have had sexual activity in the past. Participants ($N = 857$) were mainly young adults ($M_{years} = 23.13$, $SD_{years} = 7.04$) and most identified as female (58.69%) (see Table 1 for sample details). The link to the online survey was shared by research assistants using non-probability snowball sampling that started with psychology students. Participants received information about the study and had to provide informed consent before proceeding to the survey. An attention check item was also included in the middle of the survey (e.g., "To check that you are reading each question, please respond to the 'Not at all satisfied' option").

Measures

Sexual satisfaction

Sexual satisfaction was measured using the New Sexual Satisfaction Scale Short Form (NSSS-S; Stulhofer et al., 2011). We used the Colombian adaptation of the Spanish version validated by Strizzi and colleagues (2016). The original scale includes 12 item and assesses overall sexual satisfaction at an individual level ("My letting go and surrender to sexual pleasure during sex") and an interpersonal level ("My partner's sexual creativity"). Responses to each item were given in 5-point rating scales (1 = *Not at all satisfied* to 5 = *Extremely satisfied*). For this study, we assessed only individual sexual satisfaction. Higher scores in the scale indicate more individual sexual satisfaction ($\Omega = 0.87$).

Table 1 Demographic characteristics

Demographics	%
Gender	
Men	39.90
Women	58.69
Other	0.82
No response	0.58
Sexual Orientation	
Heterosexual	82.52
Bisexual	10.28
Homosexual	4.99
Other	1.32
No response	0.88
Age Group	
Early adulthood (18–39 years)	95.98
Middle adulthood (40–65 years)	5.02
Marital Status	
Married	8.40
In a relationship	45.86
Single—between relationship	14.60
Single—difficult to attract a partner	7.81
Single—prefer to be single	23.33
Education	
No education	0.14
Elemental school	0.73
High school	30.83
College	14.39
Undergraduate	48.31
Graduate	5.58
Residence	
Atlántico	80.51
Bolivar	4.55
Bogotá D.C	2.56
Other	12.38

Sexual functioning

Sexual functioning was assessed using the Spanish version of the Massachusetts General Hospital-Sexual Functioning Questionnaire (MGH-SFQ; Sierra et al., 2012). We reviewed each item to be adequate to the Colombian population. The number of items of the MGH-SFQ varies according to the respondent's sex assigned at birth, as one of the items fail to assess sexual functioning in women ("How has your ability to achieve and maintain an erection in the last month been?"). Responses to each item were given in 5-point rating scales (0 = *Totally decreased* to 4 = *Normal*). Higher scores indicate better sexual functioning ($\Omega_{men} = 0.88$, $\Omega_{women} = 0.90$).

Sexual drive

To assess sex drive, we developed three items: "I have a strong sex drive," "It does not take me long to become sexually aroused," and "My sex drive is higher than most people's". Responses to each item were given in 7-point rating scales (1 = *Strongly disagree*" to 7 = *Strongly agree*). Responses were mean-averaged ($\Omega = 0.76$), with higher scores indicating more sexual drive.

Sociosexual orientation

We used the Colombian version (Romero et al., 2022) of the nine-item scale Sociosexual Orientation Inventory – Revised (SOI-R; Penke & Asendorpf, 2008). We assessed sociosexual desires (three items; e.g., "How often do you experience sexual arousal when in contact with someone with whom you are not in a committed romantic relationship?"), sociosexual attitudes (three items; e.g., "Sex without love is okay"), and sociosexual behaviors (three items; e.g., "With how many different partners have you had penetrative sex in your life?"). Responses to each item were given on 5-point rating scales (response scales depend on the item). In the Colombian validation study the SOI-R showed adequate reliability ($\Omega = 0.94$).

Personality traits

We used the 15-item Big Five Inventory II—XS scale (BFI 2-XS) developed by Soto and John (2017) to assess agreeableness (three items; e.g., "I am someone who is compassionate, soft-hearted"), extraversion (three items; e.g., "I am someone who is full of energy"), conscientiousness (three items; e.g., "I am a person who finds it hard to get down to work", reversed item) open-mindedness (three items; e.g., "I am an original person, I come up with new ideas"), and negative emotionality (three items; e.g., "I am a person who worries a lot"). Responses to each item were given in 5-point rating scales (1 = *Strongly disagree* to 5 = *Strongly agree*). The reliability of the Big Five subscales in this sample ranged from poor to acceptable ($0.35 < \Omega < 0.65$) because of the reduced number of items per dimension.

Dark triad

We used the Spanish version (Dorta, 2021; Pineda et al., 2020) of the Short Dark Triad (SD3; Jones & Paulhus, 2014). This measure includes 27 items to assess psychopathy (nine items; e.g., "It is true that I can be mean to others"), machiavellianism (nine items; e.g., "Make sure your plans benefit you, not others"), and narcissism (nine items; e.g., "Many group activities tend to be boring without me"). Responses to each item were given in 5-point rating scales (1 = *Strongly disagree* to 5 = *Strongly agree*). Higher scores in SD3 indicate more psychopathy ($\Omega = 0.74$), machiavellianism ($\Omega = 0.73$), and narcissism ($\Omega = 0.58$).

Data analytic plan—modelling

After data preparation (see supplementary materials) we computed separate supervised models in python 3.11 (Python Software Foundation, 2022), specifically using'sklearn' library (Pedregosa et al., 2011). In this study, SVM, RF, LR, XGBoost and ANN models were implemented for both women and men separately, considering the gender differences reported in past studies (see Vowels et al., 2022a, 2022b). The observations were divided into two parts, which were used for training (75%) and testing (25%) the algorithms with the aim of evaluating the performance of each algorithm in classifying both training data and unseen data (testing). The division of the dataset was done using random and stratified sampling to control that both datasets keep similar proportions between sexually satisfied and dissatisfied participants. Overfitting of the models was controlled using five-fold cross-validation and a GridSearch was used to select the model with the best correct classification rate in the validation set, but the decision/probability function of the models was adjusted by maximizing the sensitivity and specificity of the models to decrease false positives and false negatives, respectively. Also, Receiver Operating Characteristic (ROC) Curve and confusion matrix were calculated for each classification model. Finally, the RF classifier was used for performing analysis of the feature importance analysis in terms of entropy.

Results

Five supervised learning models were trained to classify sexually dissatisfied women, results showed that the model with the best score of classification in the test data was the RF (accuracy = 0.84, see Table 2), outperforming the metric obtained in the training data (accuracy = 0.82). However, when the decision/likelihood function cutoff point was adjusted, the model with the highest sensitivity and specificity was XGBoost. This algorithm improved the classification metrics, specifically XGBoost showed the best specificity (accuracy = 0.84) while retaining an acceptable sensitivity (accuracy = 0.76), which means that XGBoost was the best algorithm to detect sexual dissatisfied such as sexual satisfied women (Fig. 1).

In the context of classifying sexually dissatisfied men, classification accuracy scores ranged between 0.72 and 0.80 (see Table 2). Metrics analysis revealed that ANN exhibited the best performance for test data classification. Additionally, when sensitivity and specificity were calculated for the

Table 2 Machine learning algorithms' performance

Sample	Algorithm	Cross-validation accuracy	Test score	AUC	Sensitivity	Specificity	F1 score
Women	SVM	0.81	0.76	0.80	0.74	0.70	0.57
	RF	0.82	0.84	0.85	0.71	0.76	0.59
	LR	0.80	0.75	0.82	0.71	0.76	0.59
	XGBoost	0.79	0.80	0.82	**0.84**	**0.76**	0.65
	ANN	0.82	0.76	0.80	0.71	0.76	0.59
Men	SVM	0.75	0.72	0.66	0.71	0.57	0.48
	RF	0.76	0.76	0.70	0.76	0.56	0.49
	LR	0.75	0.79	0.81	0.76	0.78	0.63
	XGBoost	0.75	0.75	0.70	0.90	0.31	0.45
	ANN	0.75	0.80	0.80	**0.76**	**0.81**	0.65

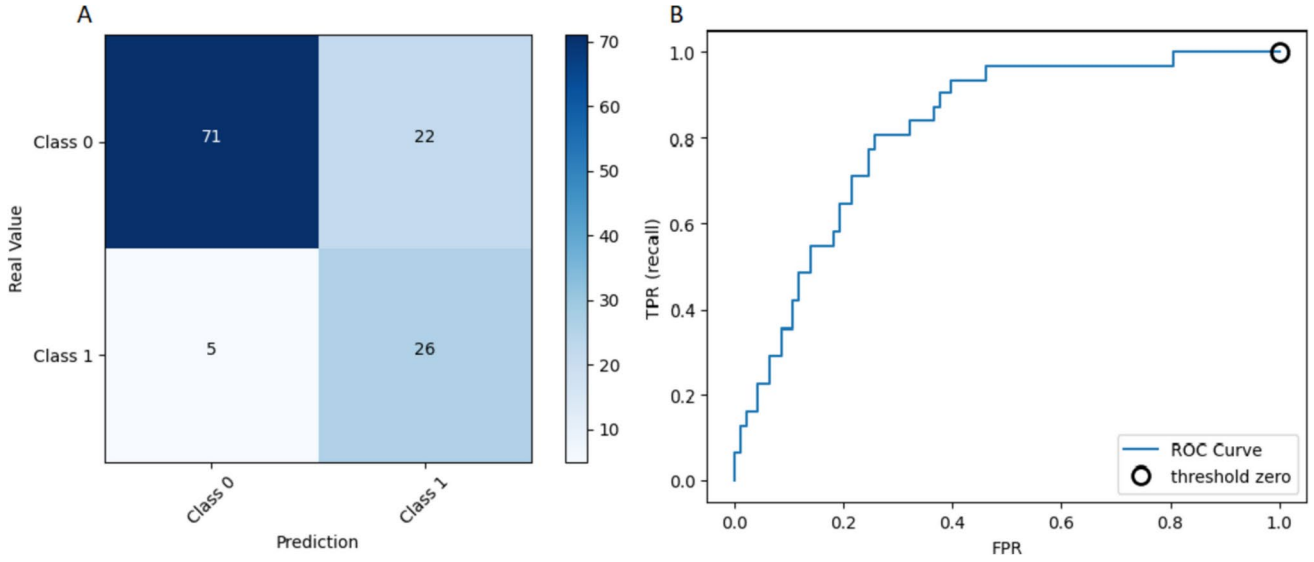

Fig. 1 Confusion matrix and ROC curve for sexual satisfaction prediction in women

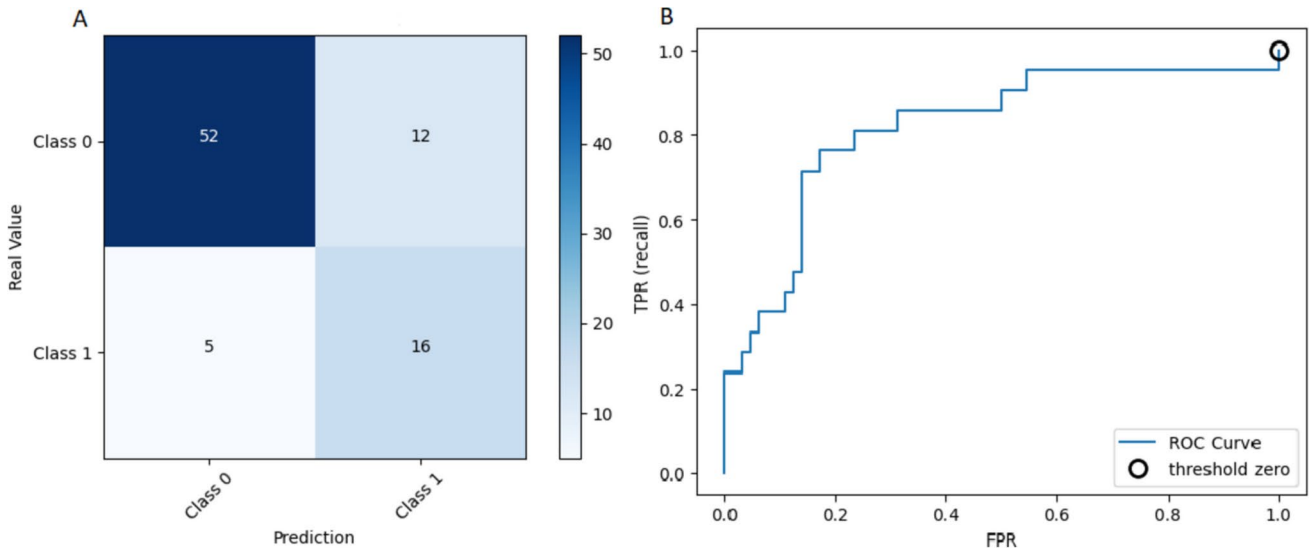

Fig. 2 Confusion matrix and ROC curve for sexual satisfaction prediction in men

adjusted cutoff point, ANN demonstrated superior performance by reducing false negatives (specificity = 0.81) and false positives (sensitivity = 0.76). Despite XGBoost shows high sensitivity (sensitivity = 0.90) in classifying sexually dissatisfied men, it failed to maintain an acceptable performance to reduce false negatives (specificity = 0.40). Thus, while XGBoost was the model with the best classification score to detect sexually dissatisfied women, ANN was the algorithm with the best performance for men (Fig. 2).

Feature importance analysis

Next, analysis aimed to determine which of the included variables, including sexual, personality, and demographic variables, provide the most information for distinguishing sexually satisfied from unsatisfied individuals. We found that sexually unsatisfied women reported lower sexual functioning, scored lower on conscientiousness, extraversion, and narcissism, reported a more restricted sociosexual desire, and indicated to be voluntarily single. In contrast, sexually satisfied women reported higher sexual drive and more unrestricted sociosexual behavior and scored moderately on machiavellianism (see Fig. 3). According to the importance analysis, sexually unsatisfied men reported a more restricted sociosexual behavior, scored lower extraversion and narcissism, and scored with moderately on machiavellianism. In contrast, sexually satisfied men reported higher sexual

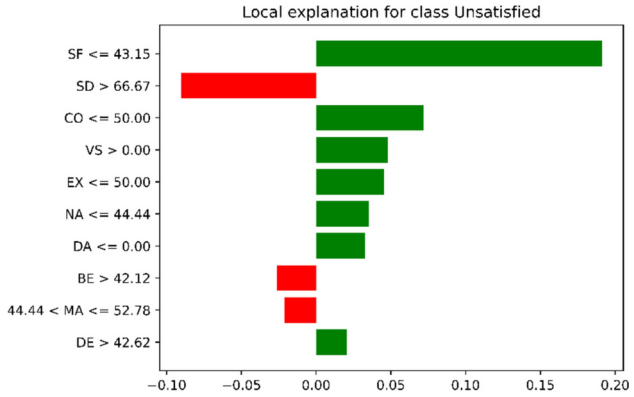

Fig. 3 Importance feature for sexual unsatisfaction prediction in women. *Note*. SF = sexual functioning, SD = sexual drive, CO = conscientiousness, VS = voluntary singlehood, EX = extraversion, NA = narcissism, DA = dating, BE = sociosexual behavior, MA = machiavellianism, DE = sociosexual desire

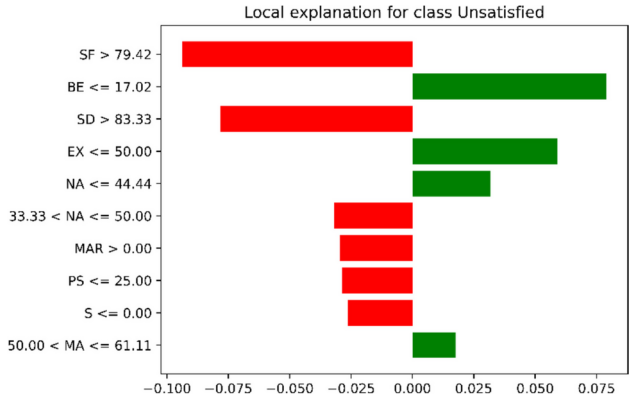

Fig. 4 Importance feature for sexual unsatisfaction prediction in men. *Note*. SF = sexual functioning, BE = sociosexual behavior, SD = sexual drive, EX = extraversion, NA = narcissism, MAR = married, PS = psychopathy, S = single between relationship, MA = Machiavellianism

functioning and sexual drive, scored moderately on narcissism, scored lower on psychopathy, and were married (see Fig. 4).

Discussion

A wide range of supervised learning algorithms (SVM, RF, LR, XGBoost and ANN) were tested to predict sexual satisfaction in a non-clinical sample of Colombian men and women. The results of this study showed that XGBoost model was the best to classify sexual satisfaction in women, overcoming RF, which was the algorithm implemented for continuous data by Vowels and colleagues (2022a, 2022b). For men, ANN was the algorithm with the best performance to classify sexual satisfaction. This algorithm showed sensitivity like that of RF. And yet, ANN notably optimized the specificity of classification, thus highlighting the advantages that can arise from the use of neural network models.

Sexual functioning was the predictor that provided the most information for classification for both women and men, followed by sexual desire, which remained among the top three predictors for sexual satisfaction classification. These results reflect the interconnection between biological factors and an individual's perception of their sexuality. For example, difficulties in sexual functioning are often associated with lower emotional support, self-esteem, optimism, and life satisfaction (Mernone et al., 2019). Sexual impulse, on the other hand, motivates individuals to seek new sexual encounters and facilitates a higher number of sexual experiences across the life spam (Walton & Bhullar, 2018). Like past studies, we also found that sociosexual behavior is related to greater sexual satisfaction in both women and men (Mark et al., 2015), which could be explained by the increased opportunities for sexual exploration within a variety of contexts. We also found that more unrestricted levels of sociosexual desire in women were associated with sexual dissatisfaction. This finding is consistent with the results reported by Dosch and colleagues (2016), who found that less dyadic sexual desire is associated with lower sexual satisfaction.

We found that lower extraversion and narcissism allow for the detection of sexually dissatisfied men and women. People who score lower on these personality traits often have difficulty to express their sexual needs and openly communicate their interest to their partner, which generates difficulties in fully enjoying intimacy with them (Babin, 2013). The results also showed that only moderate levels of narcissism were related to sexual satisfaction in men. This can be linked to people who score higher on narcissism having difficulties in stablishing satisfactory sexual relationships due to their tendency to prioritize their own needs over those of others, likely resulting in conflicts and emotional disconnection within the couple (Kjærvik & Bushman, 2021).

Although moderate levels of machiavellianism were related to sexual satisfaction in women, the opposite association emerged for men. This suggests that women who scored moderately on machiavellianism may have a greater ability to deal with the complexities of sexual relationships and meet their own needs strategically, thus contributing to their sexual satisfaction. Notably, this result is against past findings (Steininger & Pietschnig, 2022). In contrast, men who scored moderately on machiavellianism may be more likely to coerce their partners, which can lead to conflict and emotional detachment in sexual relationships and result in lower sexual satisfaction (Lyons et al., 2022).

Voluntarily single women were more likely to be classified as sexually dissatisfied, whereas married men were more likely to be classified as sexually satisfied. These results

contrast with the general notion that voluntarily single individuals tend to be more sexually satisfied due to their low desired sex frequency (Kislev, 2021). In that sense, our findings suggest that Latin-American women can have different reasons to be voluntary single when compared to European women (see Apostolou & Christoforou, 2022). Moreover, the higher likelihood of married men being classified as sexually satisfied contradicts Kislev's (2020) results, who found no association between sexual satisfaction and marital status. Therefore, it is necessary for other research to include the relationship length size in the analysis.

We also found that women who scores lower on conscientiousness were classified as sexually dissatisfied. This might have occurred because less conscientious individuals tend to be more impulsive and enact risk-taking behaviors (Singh, 2022). In turn, this can contribute to relationship instability and sexual dissatisfaction.

In the case of psychopathy, results showed that lower levels of this trait were associated with sexual satisfaction in men. This finding suggests that lacking psychopathic traits (e.g., emotional insensitivity; absence of empathy) may allow for greater emotional connection and satisfaction among men. This emotional connection may foster intimacy and mutual pleasure within the partner, thereby contributing to higher sexual satisfaction (Weiss et al., 2018).

This study underscores the utility of advanced supervised learning techniques in psychological research by identifying specific algorithms, such as XGBoost for women and ANN for men, as most effective for classifying sexual satisfaction. This finding suggests that integrating machine learning methods can significantly enhance the precision and specificity of predictive models in non-clinical contexts. Furthermore, it underscores the importance of addressing both the physical and emotional aspects of sexuality, as it confirms that factors like sexual functioning and desire are key predictors of sexual satisfaction. These insights can inform clinical interventions and sexual education programs aimed at promoting satisfactory sexual relationships. Additionally, it reveals how certain personality traits, such as narcissism and psychopathy, are related to sexual satisfaction, highlighting the need to consider personality in the design of personalized therapies and wellness programs. Lastly, the results regarding marital status challenge previous notions and emphasize the importance of considering cultural and contextual dynamics in the analysis of sexual satisfaction, which may impact policies and practices related to sexual health and relationships.

Cultural differences can significantly influence the sexual and personality variables examined in this study. For instance, research shows that Mexican women are more likely to end relationships due to ejaculation issues in their partners compared to Italian or South Korean women, while Italian women report lower sexual satisfaction than their Mexican and South Korean counterparts (Burri & Graziottin, 2015). Similarly, personality traits like narcissism, psychopathy, and Machiavellianism may be interpreted and expressed differently across cultures. For example, some Asian countries show no gender differences in psychopathy, hierarchical cultures report higher narcissism levels (Rogoza et al., 2021), and cultural factors can account for up to 16% of data variability (Aluja et al., 2022). These cultural variations can affect not only the prevalence of certain behaviors and attitudes but also their relationship with sexual satisfaction.

Our results highlight the relationship between personality traits and sexual satisfaction, as previously identified in some studies (Allen & Walter, 2018; Jirjahn & Ottenbacher, 2023; Sayehmiri et al., 2020). In this regard, it is recommended that future research, based on advanced data analytics techniques aiming to predict or classify aspects of human sexuality, incorporate a component related to personality traits to enhance the performance of algorithms. Furthermore, it is recommended that the implementation of classification algorithms with psychological data not be limited to the use of a single algorithm, and that hidden patterns be explored through unsupervised machine learning techniques.

Limitations

Among the main limitations of this study is the sampling technique used. The sample was obtained through non-probabilistic sampling; therefore, it is recommended that future studies take precautions to ensure the representativeness of the data. Our study primarily involved the participation of heterosexual men and women, young adults, and individuals with a high level of education, thus it is necessary for future research to broad the diversity of the sample to align the predictions of the algorithms more closely with representative samples and thus enhance classification performance. While our findings provide valuable insights within the Colombian context, it is essential to consider how these factors may interact differently in other cultures, underscoring the need for cross-cultural studies to examine the generalizability of these results. Finally, machine learning techniques are particularly useful for creating forecasting or detection tools for specific cases. However, many of these techniques still exhibit limitations in interpretatively representing second order and nonlinear relationships between inputs and the output variable. Therefore, other studies could benefit from the use of modeling techniques such as structural equation modeling.

Conclusions

This study investigated sexual satisfaction in Colombian men and women using various supervised learning algorithms. It found that XGBoost and ANN were most effective in classifying sexual satisfaction in women and men respectively. The results highlight the interconnection between biological factors and individual perceptions of sexuality, as well as the influence of personality traits such as extraversion and narcissism on sexual satisfaction. These findings underscore the importance of considering gender and personality differences in researching and addressing sexual satisfaction. Additionally, they emphasize the significance of utilizing machine learning techniques in studying sexuality.

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Authors contributions DR: Conceptualization; Formal Analysis; Methodology; Writing, review & editing. **LR:** Formal Analysis; Writing, review & editing. **DLR:** Conceptualization; Investigation; Writing, review & editing. **MM:** Investigation; Writing, review & editing.

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Data availability The datasets generated by the survey research during and/or analyzed during the current study are available at OSF repository. https://doi.org/10.17605/OSF.IO/49KTE.

Declarations

Competing interests The authors have declared they have no competing interests to disclose.

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