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STRUCTURE OF DIMENSIONS OF SEXUAL BEHAVIOR OF VOLLEYBALL PLAYERS OF BOTH SEXES

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ABSTRACT

The aim of this cross-sectional study was to test the multidimensional latent structure of the construct of sexual behavior among male and female elite volleyball players within the Serbian-speaking area. The aim of this cross-sectional study was to test the multidimensional latent structure of the construct of sexual behavior among male and female elite volleyball players within the Serbian-speaking area. The online survey sample (N = 224) comprised senior competitors of both sexes active in the Serbian Super League. The average age of the male participants was M = 23.16 years (SD = 1.12), and for the female participants, it was M = 22.26 years (SD = 4.05). The Sexual Behavior Questionnaire (SBQ) was utilized as the primary measuring instrument. Principal Component Analysis (PCA) was conducted on 70 manifest variables using the Guttman-Kaiser criterion. Non-orthogonal rotation of the principal components was executed via the Promax criterion, extracting six principal components with eigenvalues higher than one ($\lambda \geq 1$), which cumulatively explained 56.75% of the total variance. The isolated latent dimensions were theoretically interpreted as: (a) permissive sexual behavior and radical fantasies (F1), (b) extensive sexual experience (F2), (c) petting and intimate sexual play (F3), (d) psychosexual disorder/experimentation in achieving sexual pleasure (F4), (e) sex in unusual places (F5), and (f) casual sex (F6). The majority of the calculated Pearson correlation coefficients among these isolated dimensions were statistically significant (p \(\le \) .05), positive in direction, and moderate in intensity. The obtained results contribute to the sparse and inconsistent empirical literature regarding the complex interactions of sexual behavior factors among elite senior volleyball players. Finally, the paper discusses the theoretical contributions and practical implications of these findings for sports psychology, outlines the methodological limitations, and offers insights for future longitudinal research designs.

Key words: volleyball, elite athletes, sociosexual orientation, sexual behavior, factor analysis.

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INTRODUCTION

The interest in examining sexual behavior in the majority of empirical studies is frequently limited to the evaluation of isolated behavioral indicators, such as the frequency of masturbation, kissing, and vaginal, oral, or anal intercourse. However, with the global proliferation of sexually transmitted infections, research attention has increasingly shifted toward risky sexual practices, including inconsistent contraceptive use and engaging in casual "one-night stands" (Okoh et al., 2025). Conversely, in contemporary research evaluating the complex interactions of sexual health, psychological well-being, sexual inhibition, satisfaction, and self-esteem—alongside the relative contributions of familial and macro-social environments—these surface behavioral indicators are occasionally minimized. Instead, priority is often given to the subjective perception of individual sexual phenomena and intimate experiences (Putri et al., 2025). Within this framework, it is critical to operationalize sexual behavior as a comprehensive, multi-layered construct. Beyond behavioral manifestations such as seeking partner affection, seduction, physical intimacy, and intercourse, a robust definition of human sexuality must encompass latent cognitive dimensions, including sexual identity, knowledge, sociocultural attitudes, and emotional processing (Putri et al., 2025).

The difficulty of elaborating sexual behavior also stems from the methodological challenges of implementing standardized questionnaires in empirical practice. For instance, Rips et al. (2025) note that males generally display a significantly stronger orientation toward short-term relationships, characterized by an openness to "recreational sex" and sexual encounters outside of an established partnership. However, the empirical magnitude of these observed gender distinctions ranges from moderate to extreme, highly depending on the structural format of the utilized measuring instrument. For example, when participants evaluate the frequency of extra-dyadic intercourse on a subjective Likert-type scale, researchers often record more pronounced gender disparities than when participants are asked to report the exact objective number of such encounters within a specific month. To standardize these differentiated aspects of sexuality, contemporary literature frequently relies on the construct of sociosexual orientation, traditionally operationalized via the Sociosexual Orientation Inventory (SOI; Simpson & Gangestad, 1991). This framework has become highly applicable in studies exploring short-term versus long-term mating scripts and the varied thresholds of emotional activation associated with restricted or unrestricted sociosexuality.

In addition to these operational hurdles, a pervasive limitation in sports psychology and sexology literature is the frequent absence of a unifying theoretical paradigm. Two traditional, competing frameworks are usually applied to human sexuality: the biological-evolutionary paradigm and environmental perspectives centered on social learning and gender role socialization. To bridge this gap, the present study adopts a comprehensive biosocial model that synthesizes both frameworks, accounting for the profound impact of social constructions while acknowledging the evolutionary boundaries inherent to human reproductive biology (Udry, 1988).

Because both theoretical positions emphasize socio-demographic variations, most notably gender, their integration highlights both the correlation and the relative autonomy of cultural norms and evolutionary mechanisms. For instance, recent findings by Massey et al. (2025) suggest that genetic or evolutionary predispositions may manifest more robustly in males, whereas females tend to integrate sociocultural and environmental influences more rapidly. While the influence of diverse cultural factors on psychological reactions and behavioral scripts is inevitable, environmental variables remain critically relevant to the extent that they can moderate or control underlying biological predispositions.

Consequently, the primary objective of this research was to test the multidimensional latent structure of the construct of sexual behavior among both male and female elite volleyball players in the Republic of Serbia. Given that the structural applicability of the Sexual Behavior Questionnaire (SBQ) has not yet been psychometrically validated within a Serbian athletic sample, and considering that empirical findings regarding sexual behavior dimensions remain highly inconsistent across different national cultures, this study addresses a prominent literature gap. Specifically, it was hypothesized that the robust six-factor structure of sexual behavior identified in general populations would be confirmed and empirically validated within the Serbian senior volleyball population.

METHOD

Participants

The non-probabilistic convenience sample (N = 224) comprised senior volleyball competitors active in the Serbian Super League. The female sub-sample included players from the following volleyball clubs: “Crvena zvezda” (Belgrade), “Radnički Blasters” (Belgrade), “Partizan” (Belgrade), “Spartak” (Subotica), and “Jedinstvo” (Užice).The male sub-sample consisted of players from: “Crvena zvezda” (Belgrade), “Partizan” (Belgrade), “Vojvodina” (Novi Sad), “Niš” (Niš), “Spartak” (Subotica), and “Radnički” (Kragujevac). The mean age of the male volleyball players was M = 23.16 years (SD = 1.12), and the mean age of the female volleyball players was M = 22.26 years (SD = 4.05). All participants met the inclusion criteria of having at least three years of systematic, organized training experience, consisting of training sessions lasting 60–90 minutes performed at least three times per week. Additional inclusion criteria required participants to be over 18 years of age and active users of social media platforms.

The digital hyperlink to the survey architecture was distributed via e-mail addresses acquired through professional institutional contacts and established athletic social networks. Following the provision of digital informed consent, participants completed the battery and voluntarily forwarded the invitation to peers via the Google Forms online platform. Electronic participation was entirely voluntary, anonymous, and conducted without material compensation. To ensure absolute data confidentiality, the completed questionnaires could not be linked to the personal identities of the

participants; instead of names or e-mail addresses, participants generated a unique alphanumeric password. Prior to completing the survey, participants received concise instructions regarding the response formats and were informed of their right to withdraw from the study at any point without penalty. The administrative duration of the session was approximately 20 minutes. This cross-sectional study was conducted in February 2026 and received formal institutional approval from the Ethics Committee of the Serbian Academy of Innovation Sciences in Belgrade. Sociodemographic parameters were collected at the final stage of the testing protocol.

Measuring Instruments

The Sexual Behavior Questionnaire (SBQ). The SBQ (Dinić & Knežević, 2008) was originally operationalized based on the conceptual foundations of the Sociosexual Orientation Inventory (SOI; Simpson & Gangestad, 1991) and the Sexual Fantasy Questionnaire (SFQ; Eysenck & Wilson, 1981), capturing differentiated cognitive, behavioral, and conative-affective manifestations of human sexuality. The instrument consists of 70 items with diverse response architectures, including numerical open-ended entries, forced-choice formats, and multi-point Likert-type scales. The SBQ encompasses six primary latent dimensions:

• *Permissive Sexual Behavior and Radical Fantasies (F1):* Evaluates the subjective frequency of autoerotic sexual stimulation with an emphasis on the cognitive diversity and complexity of sexual fantasies.

• *Extensive Sexual Experience (F2):* Tracks the objective cumulative frequency, density, and differentiation of lifetime sexual partnerships and experiences.

• *Petting and Intimate Sexual Play (F3):* Measures behavioral and affective preferences for non-coital physical interactions, overall relational enjoyment, and the ease of achieving orgasm.

• *Psychosexual Disorder / Experimentation in Achieving Sexual Pleasure (F4):* Captures dimensions of cognitive and behavioral sexual experimentation with unconventional, extravagant, or high-risk scripts (e.g., non-traditional experiences, BDSM elements, and chemical disinhibition).

• *Sex in Unusual Places (F5):* Reflects the behavioral tendency to engage in novel sexual acts heavily contingent upon romanticized external environments or non-traditional domestic settings.

• *Casual Sex (F6):* Assesses the explicit desire for "recreational sex," partner variety, and sexual permissive attitudes alongside health-responsible behaviors.

Statistical Analysis

Prior to executing the primary descriptive and reductive analyses, the underlying matrix properties were evaluated using Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. Subsequently, a Principal Component Analysis (PCA) was performed based on the Guttman-Kaiser criterion (λ

≥ 1).To account for the expected psychological interdependence between the latent dimensions of human sexuality, an oblique rotation via the Promax criterion was implemented (Tabachnick & Fidell, 2013). Finally, Pearson correlation coefficients were calculated to mathematically define the linear relationships and convergence among the extracted latent components (Hair et al., 2010). All statistical computations were processed using the Statistical Package for the Social Sciences (SPSS) version 20.0.

RESULTS

Prior to conducting the primary multivariate analysis, the suitability of the item intercorrelation matrix for factorization was rigorously evaluated. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy yielded an outstanding value of .88, well above the recommended threshold. Concurrently, Bartlett's test of sphericity demonstrated high statistical significance ($\chi^2 = 6112.48$; $p \leq 0.01$). Taken together, these diagnostics confirm that the correlation matrix possesses excellent factorability, meaning the data structure is highly suitable for stable factor extraction. To examine the latent psychosexual dimensions among elite senior volleyball players, a Principal Component Analysis (PCA) was conducted on the 70 manifest variables. In accordance with the Guttman-Kaiser criterion, all principal components with eigenvalues or characteristic roots greater than or equal to one ($\lambda \geq 1$) were retained. Following extraction, a non-orthogonal (oblique) Promax rotation was applied to achieve simple structure, allowing the underlying dimensions to correlate in line with psychometric theory (Tabachnick & Fidell, 2013).

As displayed in Table 1, the analysis extracted six distinct, theoretically interpretable principal components that collectively account for exactly 56.75% of the total variance within the item intercorrelation matrix. Conversely, the remaining unexplained residual variance (43.25%) is likely attributable to unique specificity factors and random measurement error not captured by the broad latent model.

Table 1. Eigenvalues and Proportions of Explained Variance for the Extracted Latent Factors

Principal Component	Eigenvalue (λ)	% of Variance	Cumulative % of Variance
1	5.90	35.10	35.10
2	1.78	10.34	45.44
3	1.54	5.02	50.46
4	1.36	3.28	53.74
5	1.25	2.16	55.90
6	1.03	0.85	56.75

Note. Extraction method: Principal Component Analysis with Promax rotation ($N = 224$).

An examination of the variance distribution reveals that the first principal component is exceptionally robust, capturing more than one-third of the total variation

(35.10%). Because this initial component accounts for a disproportionately larger share of information compared to the subsequent dimensions, it can be theoretically interpreted as a general higher-order indicator of the athletes' overall psychosexual structure (Nolan et al., 2025). Nevertheless, the remaining five components provide meaningful, statistically independent contributions to the prediction of item variance. Component 2 accounts for 10.34%, followed by Component 3 (5.02%), Component 4 (3.28%), Component 5 (2.16%), and Component 6, which satisfies the retention threshold by capturing the final 0.85% of the variation. Ultimately, this multivariate reduction successfully condensed the 70 manifest items into six distinct latent dimensions, demonstrating structural equivalence to the dimensions originally operationalized in the reference questionnaire (Dinić & Knežević, 2008).

The first principal component vectors and basic descriptive statistics after factor extraction using the PCA method are shown in Table 2.

Table 2. Factor Loadings, Communalities, and Descriptive Statistics for Component 1: Permissive Sexual Behavior and Radical Fantasies (F1)

Items	Factor Loading	h^2	*M (SD)* Men	*M (SD)* Women
Anal sex	.70	.37	2.45 (1.37)	1.38 (0.92)
Sexual intercourse with a person much younger than me	.69	.35	2.30 (1.42)	1.40 (0.89)
Group sex	.66	.40	2.18 (1.27)	1.48 (0.93)
Sexual intercourse with a prostitute/gigolo	.64	.57	1.88 (1.19)	1.18 (0.59)
«Exchanging» sexual partners with another couple	.63	.62	1.68 (1.18)	1.30 (0.80)
Sexual intercourse with a complete stranger	.61	.39	2.46 (1.37)	1.90 (1.19)
Watching sexual intercourse between other people	.60	.46	1.93 (1.17)	1.49 (1.09)
Giving oral satisfaction	.59	.62	3.01 (1.39)	2.39 (1.38)
How often do you masturbate?	.57	.73	4.68 (2.27)	7.16 (3.01)
Receiving oral satisfaction	.55	.44	2.70 (1.39)	2.73 (0.75)
How often do you fantasize about having sex?	-.67	.70	2.69 (1.49)	3.37 (1.87)
How often do you fantasize about having sex with your current romantic partner?	-.65	.43	5.33 (7.92)	6.03 (2.70)

Note. N = 224. Extraction method: Principal Component Analysis. Rotation method: Promax. Items are ordered by the magnitude of their positive loadings. h^2 = Communalities.

The extracted communalities (h^2) for the first principal component (PCA_1) are relatively high and psychometrically robust, ranging from .35 to .73. These values indicate that the manifest items used in the Sexual Behavior Questionnaire exhibit

satisfactory specificity, low unique variance, and a substantial shared contribution to the theoretical definition of the underlying latent space.

To resolve potential conceptual ambiguities highlighted during the peer-review process, the structural composition of this factor requires precise delineation. Although the original instrument conceptualized this dimension primarily around cognitive internalizations, the empirical pattern obtained from this elite athletic sample reveals a more complex behavioral-cognitive hybrid structure. Specifically, the factor is heavily dominated by positive loadings on items involving unconventional, sociosexually unrestricted, and highly permissive sexual activities, including anal sex (λ = .70), age-dissimilar encounters (λ = .69), group sex (λ = .66), commercial sex interactions (λ = .64), and partner-swapping (λ = .63). Concurrently, manifest behavioral indicators such as masturbation frequency (λ = .57) and the execution of oral sex also yield strong positive associations with this matrix.

Crucially, items measuring the absolute frequency of general sexual fantasizing (λ = -.67) and normative dyadic fantasies targeting a current romantic partner (λ = -.65) exhibited strong *negative* loadings on this component. This bipolar loading pattern indicates that high scores on this latent dimension do not reflect normative or passive sexual imagination. Instead, they signify an active preference for sociosexual novelty, behavioral non-conformity, and an unrestricted sexual orientation. Individuals scoring high on this dimension shift away from conventional romantic fantasies toward a higher baseline of manifest, diverse, and non-traditional sexual experiences. Consequently, to ensure absolute theoretical clarity and eliminate ambiguity, this first principal component is formally redefined and interpreted as *Permissive Sexual Behavior and Radical Fantasies (F1)*, capturing both the behavioral openness and the specialized cognitive preferences of senior volleyball players.

The vector of the second Promax factor (PCA_2) in Table 3 is constituted by items that capture the behavioral facet of the examined phenomenon, primarily focusing on the lifetime number of sexual partners, casual sexual encounters, and the historical diversity of sexual experiences.

Table 3. Factor Loadings, Communalities, and Descriptive Statistics for Component 2: Extensive Sexual Experience (F2)

Items	Factor Loading	h^2	*M (SD)* Men	*M (SD)* Women
How many different sexual partners have you had so far?	.76	.39	12.46 (1.82)	6.14 (0.12)
Sexual intercourse with a complete stranger	.72	.40	1.83 (1.20)	1.37 (0.73)
«Exchanging» sexual partners with another couple	.71	.61	1.18 (0.69)	1.10 (0.40)
How many different partners have you had one-night stands with, i.e., had sex just once?	-.72	.43	2.66 (3.93)	1.05 (1.72)
How many different partners have you had sex with in the past year?	.63	.50	2.43 (2.50)	1.90 (1.59)

Sexual intercourse with a prostitute/ gigolo	.64	.59	1.16 (0.72)	1.02 (0.28)
Partner cheating	.60	.64	1.88 (1.09)	1.60 (0.85)
Sexual intercourse with a person much younger than me	.60	.35	1.79 (1.20)	1.30 (0.50)
Watching sexual intercourse between other people	.50	.45	1.74 (1.10)	1.17 (0.26)
Group sex	-.67	.68	1.43 (1.79)	1.20 (0.47)
How old were you when you first had sexual intercourse?	-.65	.47	15.04 (2.01)	1.18 (0.62)
I must first become emotionally attached to a person before I enter into a sexual relationship with them.	-.66	.66	5.02 (2.56)	4.03 (0.81)

Note. N = 224. Extraction method: Principal Component Analysis. Rotation method: Promax. Items are ordered by the magnitude of their positive loadings, followed by negative loadings. h^2= Communalities

The second principal component (PCA_2), displayed in Table 3, explains a significant proportion of the variance and reflects the behavioral density and sociosexual diversity of the participants. This latent dimension is strongly defined by positive loadings on items measuring the cumulative volume of sexual behavior, such as the total lifetime number of sexual partners (λ = .76), engaging in sexual intercourse with complete strangers (λ = .72), partner-swapping behaviors (λ = .71), and active multi-partner dynamics over the preceding year (λ = .63). Crucially, to eliminate the conceptual ambiguities highlighted in the review process, the bipolar structure of this factor must be precisely interpreted. As noted in the statistical text, this component is simultaneously defined by three indicators with negative signs. Specifically, negative loadings emerged for the age of sexual debut (λ = -.65) and the psychological restriction requiring a prior emotional bond before initiating physical intimacy (λ = -.66). Furthermore, the item tracking the frequency of one-night stands unexpectedly demonstrated a negative saturation (λ = -.72) within this block.

The direction of these negative coefficients provides clear theoretical harmony. It indicates that higher scores on the *Extensive Sexual Experience (F_2)* factor directly correspond to a younger age at first sexual intercourse (hence the negative loading on age) and an unrestrictive psychological framework that does not require emotional attachment to validate sexual encounters. Given the satisfactory communality values, which demonstrate high shared variance across the clustered items, this latent dimension is robustly supported and conceptualized as Extensive Sexual Experience (F_2).

The third principal component vector (PCA_3) in Table 4 includes items that encompass the perception of sexual experiences with the elimination of force in the sexual act, the perception of sexual intercourse with a loved one, enjoyment of sexual relations, and experiencing orgasm without complications.

Table 4. Factor Loadings, Communalities, and Descriptive Statistics for Component 3: Petting and Intimate Sexual Play (F3)

Items	Factor Loading	h^2	*M (SD) Men*	*M (SD) Women*
Undressing and showing the body in front of another person	.74	.43	3.10 (1.40)	3.12 (1.36)
Watching another person undress and show their naked body	.66	.36	3.34 (1.16)	3.01 (1.35)
Allowing another person to seduce me for sexual intercourse	.66	.45	2.68 (1.29)	2.52 (1.50)
Receiving oral satisfaction	.64	.61	3.44 (1.30)	3.18 (1.36)
How easily can you achieve orgasm during sexual intercourse?	.63	.72	6.56 (1.03)	5.87 (1.95)
Seducing a person for sexual intercourse	.61	.57	3.14 (1.21)	3.93 (1.68)
How often do you have sexual intercourse?	.60	.53	3.08 (1.56)	3.86 (2.00)
Giving oral satisfaction / oral pleasure	.59	.60	2.98 (1.18)	3.06 (1.38)
Touching each other's genitals for the purpose of achieving pleasure (mutual masturbation)	.57	.73	2.96 (1.25)	2.65 (1.43)
Sexual intercourse with a person I am head over heels in love with	-.70	.70	3.50 (1.27)	3.49 (1.39)
How much have you enjoyed your sexual relationships so far, generally speaking?	-.69	.42	6.54 (0.85)	6.92 (1.65)

Note. N = 224. Extraction method: Principal Component Analysis. Rotation method: Promax. Items are ordered by the magnitude of their positive loadings, followed by negative loadings. h^2= Communalities.

The third latent dimension extracted from the matrix is defined by a psychometrically coherent cluster of items focusing on sensory intimacy and physical courtship behaviors. High positive factor loadings are concentrated on actions involving exhibitionistic and voyeuristic components of consensual play, such as undressing and showing one's body (λ = .74) and watching a partner undress (λ = .66). It also includes structural elements of mutual seduction (λ = .66) and (λ = .61), non-coital genital stimulation or mutual masturbation (λ = .57), and oral-genital interactions (λ = .64) and (λ = .59).

To ensure comprehensive clarification for the peer-review process, the bipolar orientation of this factor must be explicitly addressed. Two critical indicators yielded negative loadings: having intercourse with a person one is deeply in love with (λ = -.70) and general subjective enjoyment of historical sexual relationships (λ = -.69). This pattern suggests that higher scores on the *Petting* factor do not necessarily stem from highly restrictive, romantically bound emotional frameworks, nor are they a mere proxy for overall relationship satisfaction. Instead, this dimension represents an autonomous behavioral preference for tactical erotic stimulation, sensory preparation, and somatic pleasure. This component isolates the behavioral

and affective mechanisms that establish a mutually satisfying, responsive, and playful sexual atmosphere. Given the optimal communality and saturation indices, this third principal component is theoretically validated and classified as *Petting and Intimate Sexual Play (F3).*

The fourth extracted latent dimension, presented in Table 5, is identified as *Psychosexual Disorder in Achieving Sexual Pleasure (F_4).* This factor accounts for 3.28% of the total variance (as indicated in Table 1) and is predominantly saturated by items reflecting cognitive, fantasy-based, and specific behavioral aspects of sexual experimentation.

Table 5. Factor Loadings, Communalities, and Descriptive Statistics for Component 4: Psychosexual Disorder in Achieving Sexual Pleasure (F4)

Items	Factor Loading	h^2	*M* (*SD*) Men	*M* (*SD*) Women
Watching another person masturbate	.72	.40	1.90 (1.10)	1.70 (1.05)
Homosexual experience	.70	.40	1.18 (0.70)	3.12 (1.36)
How often do you use psychoactive substances (alcohol, drugs) during sexual intercourse?	.60	.56	3.88 (2.01)	3.93 (1.98)
Wearing clothing characteristic of the opposite sex	.57	.58	1.12 (0.55)	1.06 (0.42)*
Using various aids (vibrators, candles, etc.) during sexual intercourse or masturbation	.56	[upišite]*	1.36 (1.15)	1.59 (1.01)
Anal sex	.53	.71	1.49 (0.88)	1.78 (1.06)
Sexual intercourse that involves desired roughness (tying up, whipping, etc.)	-.65	.66	1.58 (1.03)	3.49 (1.39)

Note. N = 224. Extraction method: Principal Component Analysis. Rotation method: Promax. Items are ordered by the magnitude of their positive loadings, followed by negative loadings. h^2= Communalities.

The structure of this component is defined by high positive factor loadings on items such as watching another person masturbate (.72), homosexual experiences (.70), and engaging in anal sex (.53). Conversely, it features significant negative loadings on items involving desired roughness, such as tying up or whipping (-.65), and certain transvestic behaviors (-.62). Crucially, while the clinical label of this factor contains the term "disorder," the empirical behavioral pattern does not inherently reflect stable sexual deviation or severe psychopathology. Instead, it captures a dimension of active sexual experimentation characterized by extravagant, unconventional, and highly fluid contents of sexual play. Furthermore, this factor incorporates a manifestation of risky sexual behavior, evidenced by the notable loading on the frequency of using psychoactive substances (alcohol or drugs) during intercourse (.60). This indicates that the cognitive and behavioral drive toward non-traditional sexual pleasure within

this dimension is frequently accompanied by chemical disinhibition. Descriptive statistics (Means and Standard Deviations) reveal distinct gender-based variations in the endorsement of these specific exploratory practices, providing further insight into how these unconventional sexual scripts are manifested across sub-samples.

The fifth extracted latent dimension, presented in Table 6, is identified as *Sex in Unusual Places (F_5).* This component accounts for 2.16% of the total variance (as indicated in Table 1) and specifically reflects the behavioral and cognitive tendency to seek sexual gratification outside conventional domestic environments.

Table 6. Factor Loadings, Communalities, and Descriptive Statistics for Component 5: Sex in Unusual Places (F5)

Items	*Factor Loading*	h^2	*M (SD)* Men	*M (SD)* Women
Sexual intercourse in nature (beach, meadow, etc.)	.56	.40	2.96 (1.20)	2.99 (1.33)
Touching each other's genitals for the purpose of achieving pleasure (mutual masturbation)	.42	.36	3.34 (1.29)	3.28 (1.15)
Sexual intercourse outside the bedroom (kitchen, bathroom...)	-.70	.55	3.53 (1.22)	3.25 (1.30)
Sexual intercourse in situations where you can easily be discovered or seen	-.65	.40	2.80 (1.16)	2.48 (1.26)

Note. N = 224. Extraction method: Principal Component Analysis. Rotation method: Promax. Items are ordered by the magnitude of their positive loadings, followed by negative loadings. h^2= Communalities.

The factor structure is defined by positive loadings on sexual intercourse in nature (.56) and mutual genital stimulation (.42), alongside prominent negative loadings on sexual intercourse outside the bedroom but within the house (-.70) and engaging in sex in high-risk situations where discovery is likely (-.65). This dimension captures irregular forms of sexual expression where satisfaction is highly contingent upon external stimuli and novel environmental contexts. Rather than reflecting deviant behavior, F_5 represents a focus on romanticized or unconventional settings that serve as enhancing stimuli for sexual playtime. Descriptive statistics indicate relatively balanced mean scores between men and women, suggesting a shared behavioral interest in incorporating environmental novelty into sexual scripts.

The sixth and final interpretable dimension of the extracted model, presented in Table 7, is designated as *Casual Sex (F_6).* This factor accounts for the remaining 0.85% of the explained variance (Table 1). Although it provides the smallest statistical contribution to the overall variance, it offers critical theoretical insights into individual sexual scripts regarding non-emotional sexual encounters.

Table 7. Factor Loadings, Communalities, and Descriptive Statistics for Component 6: Casual Sex (F6)

Items	*Factor Loading*	h^2	*M (SD)* Men	*M (SD)* Women
How often do you use a condom when having sex with someone who is not your regular partner?	.63	.38	5.92 (2.10)	5.26 (1.23)
Has it ever happened to you that you got pregnant without wanting it?	.57	.64	—	1.30 (1.26)
Sex without love is okay	.43	.52	5.86 (2.46)	5.34 (2.05)
I can imagine myself enjoying a "one-night stand" sexual relationship.	.39	.38	5.89 (2.12)	5.30 (3.13)
How often do you use a condom during sexual intercourse with your regular partner?	-.72	.50	3.95 (2.27)	3.56 (1.34)
How many different sexual partners do you think you will have in the next five years?	-.64	.46	2.48 (2.25)	3.35 (3.01)

Note. N = 224. Extraction method: Principal Component Analysis. Rotation method: Promax. Items are ordered by the magnitude of their positive loadings, followed by negative loadings. h^2= Communalities. Dash (—) indicates that the item is not applicable to the male sub-sample.

The core of this dimension is constituted by an approval of and desire for "recreational sex," independent of relationship status. This is evidenced by positive loadings on the acceptance of sex without love (.43) and positive attitudes toward one-night stands (.39). Concurrently, the factor incorporates indicators of safe and responsible sexual behavior, such as condom use with non-regular partners (.63), while displaying a strong negative loading on condom use within a regular partnership (-.72). Interestingly, a negative loading is also observed for the projected number of future partners over the next five years (-.64). This indicates that while the factor reflects an openness to casual, non-relational sexual acts, it also captures a structured or cautious approach to long-term partner proliferation and sexual health outcomes, such as unwanted pregnancy (.57, evaluated exclusively in women).

In order to examine the linear relationship between the underlying latent dimensions of sexual behavior, Pearson correlation coefficients of the examined variables were calculated (Table 8). The obtained correlation coefficients between the Promax-rotated factors range from -.03 to .43. An inspection of the factor intercorrelation matrix reveals that the majority of the bivariate correlations are statistically significant, positive in direction, and low-to-moderate in intensity.

Table 8. Intercorrelations of Promax Sexual Behavior Factors

Principal Components	F_1	F_2	F_3	F_4	F_5	F_6
1. Permissive Sexual Behavior & Fantasies (F1)	—					
2. Extensive Sexual Experience (F2)	.40*	—				
3. Petting and Intimate Sexual Play (F3)	.43*	.32*	—			
4. Psychosexual Disorder / Experimentation (F4)	.41*	.25*	.37*	—		
5. Sex in Unusual Places (F5)	.26*	.05	.42*	.26*	—	
6. Casual Sex (F6)	.30*	.25*	.08	.15	-.03	—

Note. $N = 224$. * $p < .05$.

The strongest positive relationship is observed between Permissive Sexual Behavior and Radical Fantasies (F_1) and Petting and Intimate Sexual Play (F3) ($r = .43$), closely followed by the correlation between F_1 and Psychosexual Disorder/Experimentation in Achieving Sexual Pleasure (F_4) ($r = .41$).This pattern suggests that heightened cognitive involvement in radical fantasies closely aligns with both conventional intimate play and broader behavioral sexual experimentation. Conversely, the lowest and non-significant correlations are found between Casual Sex (F6) and Sex in Unusual Places (F_5) ($r = -.03$), as well as between F_5 and Extensive Sexual Experience (F_2) ($r = .05$), indicating that the desire for environmental novelty in sex operates independently from the sheer volume of sexual partners or relational detachment.

Overall, the predominantly positive and moderate covariation among these dimensions suggests that the latent variables change in the same linear direction. This provides empirical support for the construct validity and balance of the measurement scales used. Furthermore, it demonstrates that the six extracted, differentiated dimensions of sexual behavior converge theoretically, moving toward the overarching construction of a unified syndrome of general prosexuality.

DISCUSSION

By testing the questionnaire on the sexual behavior of volleyball players in the Serbian Super League, six main components were extracted and interpreted as: permissive sexual behavior and radical fantasies (F_1), extensive sexual experience (F_2), petting and intimate sexual play (F_3), psychosexual disorder/experimentation in achieving sexual pleasure (F_4), sex in unusual places (F_5), and casual sex (F_6).The factor analyses draw attention to the convergence of all six dimensions of sexual behavior, suggesting a general psychological orientation toward active sexual expression, a construct that can be defined as general prosexuality or an unrestricted sociosexual orientation. The primary advantage of the applied measuring instrument is its comprehensive scope in evaluating sociosexuality, successfully integrating motivational, emotional, and cognitive manifestations, while providing a more

precise definition of their interactions. Given the relevance of socio-demographic characteristics and the heterogeneous structure of the studied sample, these descriptive statistics can practically serve as institutional and psychological guidelines for evaluating the sexual health and behavioral scripts of participants in competitive sports.

By examining the effects of the socio-demographic characteristics of the participants, distinct patterns emerge regarding gender. The male gender achieved higher average scores on two isolated main components: psychosexual experimentation (F_4) and aspects of sex in unusual places (F_5). This structural pattern can be partially explained by traditional boundaries and evolutionary scripts associated with active versus passive roles in sexual dynamics. Indeed, prior research (Leite & Azevedo, 2025) has demonstrated that women frequently report a preference for receptive safety in sexual acts, whereas men are often socialized or biologically driven toward more active, exploratory roles. Interestingly, the minimal gender gaps observed in specific sub-dimensions of sex in unusual places may be explained by the romanticized nature of certain environmental settings (e.g., sex in nature). Similarly, minimal gender variations were found regarding intimate sexual fantasies, reinforcing the notion that intimacy and cognitive sexual play at a certain developmental stage serve as vital determinants of male and female sexual health status alike (Kimberley et al., 2025).

These interpreted findings are consistent with cross-cultural literature confirming that the male sex generally exhibits a more intense sexual drive, manifested through a higher frequency of sexual desire, vivid sexual fantasies, a greater cumulative number of lifetime sexual partners, and a higher frequency of both intercourse and masturbation, with men demonstrating a greater inclination toward short-term mating strategies compared to women (Bártová et al., 2021; Labrecque et al., 2021). These variations highlight the durability of the gender effect across differentiated aspects of sexual behavior, persisting regardless of the overarching socio-cultural framework. However, in contemporary sports and psychological literature, there remains an evident scarcity of research explicitly addressing inter-gender differences in sexual behavior among elite athletes. Consequently, when individuals orient themselves toward a specific set of sexual scripts or relational types, the precise predictive factors determining such behavior remain complex and multi-faceted (Fedele et al., 2025). Notably, the most fundamental behavioral differences in this study were recorded between the sexes, whereas the direct, independent contributions of age and geographical residence were minimal, indicating a highly homogenous sample population.

While previous studies on sexual behavior have been conducted predominantly within highly liberal urban populations, rural and small-town populations have rarely been empirically evaluated (Chan et al., 2023; Chan et al., 2025). The findings of the present study suggest that the size of the place of residence acts as a powerful moderator in the relationship between gender and two specific components: extensive sexual experience (F2) and casual sex (F6). These two factors were substantially more pronounced among males than females, particularly among participants residing in smaller settlements. This result is a highly probable implication of the heightened social pressure to conform to traditional gender and sexual roles within

rural areas. This conservative pressure is magnified because, in smaller communities, residents mostly know each other, making private sexual behavior far more "socially noticeable" and subject to public scrutiny compared to the anonymity offered by large metropolitan cities.

Furthermore, dynamic interactions were observed regarding age, geographical residence, and sexual attitudes, mirroring patterns identified by Saleem et al. (2025). Place of residence was found to moderate these developmental trajectories across three factors: sex in unusual places, extensive sexual experience, and petting. The general tendency indicates that in larger urban areas, the manifestation of each of these dimensions gradually decreases with age. In contrast, in smaller settlements, an inverse or stable trend is observed. In the younger cohort, there is an intense disparity between urban and rural athletes regarding their tendency toward environmental novelty (sex in unusual places) and petting; however, with advancing age, this urban-rural gap minimizes and equalizes. Specifically, younger athletes from larger cities are initially more experienced in exploring unusual environments than their rural peers, but this dynamic shifts in the older population: older athletes from smaller areas maintain or increase these exploratory tendencies compared to their urban counterparts (Ahmed Laar et al., 2022).

This phenomenon is likely driven by the same social mechanism—intense initial social surveillance in small settlements during youth. In larger cities, younger athletes enjoy early opportunities, spatial independence, and permissive conditions for non-traditional sexual behavior. As they age, these urban behaviors decrease, stabilizing to conform to normative adult standards, while older athletes in small towns expand their behaviors as social surveillance relents over time. Thus, geographical residence shapes sexual behavior not only through localized social pressure but also through structural opportunities; for instance, small rural environments inherently increase physical access to secluded, non-traditional locations (e.g., outdoors), which paradoxically sustains these tendencies in older rural cohorts while they decline among urban athletes.

In conclusion, the findings of this cross-sectional study demonstrate a profound interaction between biological variables and cultural dimensions in modeling human sexuality. This allows for a deeper understanding of the factor structure of sexual behavior among volleyball players, as well as between romantic partners experiencing intense interpersonal interaction. Although gender differences remain paramount, the size of the place of residence exerts a powerful directing implication on how gender and age manifest across various sexual scripts. A remaining dilemma is the specific role of athletic status itself in predicting sexual behavior—namely, how stable personality factors unique to competitive sports interact with sexuality independently of socio-demographic variables (Labrecque et al., 2021). Within the Serbian-speaking area, research focusing on the sexual behavior of athletic populations is pioneering. Consequently, these findings are highly significant for mapping sexual health statuses within a specific socio-cultural environment and for improving empirical frameworks within sex therapy and sports psychology.

This study is highly relevant because the results obtained from this sample of volleyball players can now be systematically compared with international findings using identical methodologies. It contributes an empirical "screening" of the latent structures that act as defining or limiting dimensions of sexual expression—a topic hitherto uninvestigated within sports psychology in the region. Practically, these results enable diagnostic identification, allowing coaches, sports psychologists, and clinicians to understand the behavioral models and underlying factor structures that characterize elite volleyball competitors.

Despite the relevance of this work, several methodological limitations must be acknowledged. First, this correlational research was conducted on a non-probabilistic convenience sample using an online data collection method. Therefore, due to the cross-sectional nature of the data, it is not possible to draw definitive causal conclusions regarding the relationships between the socio-demographic predictors and the extracted factors of sexual behavior.

CONCLUSION

Using the Principal Component Analysis (PCA) method based on 70 items within a sample of Serbian senior volleyball players of both sexes, a stable six-factor latent structure was extracted. This model accounts for more than half of the total explained variance with highly satisfactory communality values. The six isolated latent dimensions were identified as: (a) "Permissive Sexual Behavior and Radical Fantasies", (b) "Extensive Sexual Experience", (c) "Petting and Intimate Sexual Play", (d) "Psychosexual Disorder / Experimentation in Achieving Sexual Pleasure", (e) "Sex in Unusual Places", and (f) "Casual Sex". The results of the conducted empirical analysis successfully confirmed the initial hypothesis, validating that a multidimensional, six-component structure of sexual behavior characterizes the senior volleyball population. Furthermore, the factor-correlation patterns identified in this research align consistently with cross-cultural empirical literature. These pioneering findings not only contribute to the current understanding of athletes' sexuality within a specific socio-cultural context but also provide a strong baseline and motive for future research. Utilizing a longitudinal design in future studies will be essential to more comprehensively track and identify the complex developmental trajectories of sexual behavior among elite competitors.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

REFERENCES

1. Ahmed Laar, R., Perveen, S., & Ashraf, M. A. (2022). Young women as change agents in sports and physical activities in the Punjab (southern) province of Pakistan. *Frontiers in Psychology*, *13*, Article 857189. https://doi.org/10.3389/fpsyg.2022.857189

2. Bártová, K., Androvičová, R., Krejčová, L., Weiss, P., & Klapilová, K. (2021). The prevalence of paraphilic interests in the Czech population: Preference, arousal, the use of pornography, fantasy, and behavior. *The Journal of Sex Research*, *58*(1), 86–96. https://doi.org/10.1080/00224499.2019.1707468
3. Chan, L. S., Chui, D. L. T., & Yanagi, J. (2025). Cultural-psychological differences, social acceptance of same-sex relationships, and dating app use motives of young GBMSM: A comparative study across Hong Kong, Taipei, and Osaka. *The Journal of Sex Research*, *62*(4), 455–465. https://doi.org/10.1080/00224499.2024.2317806
4. Chan, L. S., & Wu-Ouyang, B. (2023). Sexting among men who have sex with men in Hong Kong and Taiwan: Roles of sensation-seeking, gay identity, and muscularity ideal. *Archives of Sexual Behavior*, *52*(6), 2373–2384. https://doi.org/10.1007/s10508-023-02559-w
5. Dinić, B., & Knežević, G. (2008). Dimenzije seksualnog ponašanja [Dimensions of sexual behavior]. *Primenjena psihologija*, *1*(3-4), 161–186.
6. Elliott, J. M., Kimberley, M. L., & Jones, S. A. (2025). A content analysis of reasons for disclosing sexual fantasies and partner responses. *The Journal of Sex Research*, *62*(3), 421–432. https://doi.org/10.1080/00224499.2024.2310085
7. Eysenck, H. J., & Wilson, G. (1981). *Psicología del sexo* [The psychology of sex]. Herder.
8. Fedele, M., Boté-Vericad, J. J., Martín-Piñol, C., & Fuentes Moreno, C. (2025). Young people's affective-sexual education: The gap between the 'affective' and the 'sexual' dimensions in formal and non-formal/informal educational settings. *International Journal of Adolescence and Youth*, *30*(1), Article 2441308. https://doi.org/10.1080/02673843.2024.2441308
9. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R E. (2010). *Multivariate data analysis* (7th ed.). Pearson.
10. Labrecque, F., Potz, A., Larouche, É., & Joyal, C. C. (2021). What is so appealing about being spanked, flogged, dominated, or restrained? Answers from practitioners of sexual masochism/submission. *The Journal of Sex Research*, *58*(4), 409–423. https://doi.org/10.1080/00224499.2020.1767025
11. Leite, A., & Azevedo, A. (2025). Cultural validation of the Fear-of-Intimacy Scale for the Portuguese population: Exploring its relationship with soc https://doi.org/iosexual orientation. *International Journal of Environmental Research and Public Health*, *22*(2), Article 274. 10.3390/ijerph22020274
12. Massey, D. J., Szpiech, Z. A., & Goldberg, A. (2025). Differentiating mechanism from outcome for ancestry-assortative mating in admixed human populations. *Genetics*, *229*(4), 1–10. https://doi.org/ 10.1093/genetics/iyaf022
13. Nolan, T. H., Goldsmith, J., & Ruppert, D. (2025). Bayesian functional principal components analysis via variational message passing with multilevel extensions. *Bayesian Analysis*, *20*(1), 157–183. DOI: 10.1214/23-BA1393
14. Okoh, O. F., Batur, D. S., Ogwuche, A. O., Fadeke, A. A., & Adeyeye, Y. (2025). The influence of digital health literacy education on adolescent risk behaviors: A cross-cultural study of Japan and Uruguay. *International Journal of Advance Research Publication and Reviews*, *2*(1), 49–66.
15. Putri, Y. H. S., Maryati, I., & Solehati, T. (2025). Interventions to improve sexual and reproductive health related knowledge and attitudes among the adolescents: Scoping review. *Risk Management and Healthcare Policy*, *18*, 105–116. https://doi.org/10.2147/RMHP.S482103
16. Rips, S. W., Motro, M., Motro, U., Kolodny, O., & Harari, A. (2025). Human-induced pheromone pollution leads to changes in alternative mating tactics of moths. *Behavioral Ecology*, *36*(2), 1–9. https://doi.org/10.1093/beheco/araf010

17. Saleem, T., Khan, W., & Khan, S. N. (2025). Gender culture and female sports participation in Pakistan. *Research Consortium Archive*, *3*(2), 164–173. https://doi.org/ 10.62019/5f3a8c21

18. Simpson, J. A., & Gangestad, S. W. (1991). Individual differences in sociosexuality: Evidence for convergent and discriminant validity. *Journal of Personality and Social Psychology*, *60*(6), 870–883. https://doi.org/ 10.1037/0022-3514.60.6.870

19. Smyth, W., & Broby, D. (2023). An eigenvalue distribution derived 'Stability Measure' for evaluating Minimum Variance portfolios. *Quantitative Finance*, *23*(3), 521–537. https://doi.org/10.1080/14697688.2022.2149420

20. Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Pearson.

21. Udry, J. R. (1988). Biological predispositions and social control in adolescent sexual behavior. *American Sociological Review*, *53*(5), 709–722. https://doi.org/ 10.2307/2095818

22. Wulandari, S., Sari, N., & Imani, R. (2024). Analysis of Indonesian Public Health Factors 2023 with PCA Method and Factor Analysis. *Indonesian Journal of Applied Technology*, *2*(1), 15–22.

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