Research Paper

Love, Sex & Mindfulness: Exploring the Interplay of Mindfulness with Passionate Love & Sexual Boredom (A Study of Indian Heterosexual Population)

Kirti Tarang Pande[1]*, Dr. Deepti Tumu[2]

ABSTRACT

This study of 100 heterosexual Indian participants (ages 22-51, mean 36), investigates the relationship between passionate love, sexual boredom, and dispositional mindfulness. Using the Passionate Love Scale, the Five-Factor Mindfulness Questionnaire, and the Sexual Boredom Scale, the study found that a decline in passionate love predicted sexual boredom with 92% accuracy (P < .001, RSME = .18). Additionally, dispositional mindfulness was found to moderate sexual boredom, with a positive correlation to passionate love and a negative correlation to sexual boredom. These findings offer novel insights into the psychological mechanisms underlying sexual boredom and highlight the potential benefits of mindfulness for addressing relationship conflict, infidelity, and risky sexual behaviour. The study represents a pioneering examination of the interplay between love, sex, and mindfulness.

Keywords: *Passionate Love, Sexual Boredom, Dispositional Mindfulness, Heterosexual Indian Participants, Relationship.*

The human need for sex is well-established, as evidenced by its inclusion in Maslow's hierarchy of needs (Maslow, 1943). However, sexual boredom is a common problem, characterized by monotony, reduced desire, and decreased pleasure (Oliveira, Nobre, & Carvalho, 2020). Passionate love, or intense desire for union with a partner, has been a topic of interest in psychology and sexual therapy (Hatfield & Rapson, 1987). Yet, the relationship between passionate love and sexual boredom remains understudied. This study aims to address this gap by examining the impact of mindfulness on both passionate love and sexual boredom.

Sexual boredom in long-term relationships is a significant issue, as it can lead to infidelity and relationship breakdown (Gigi & Kelly, 1992; Shackelford & Buss, 1997). Previous research has shown that sexually bored individuals are often married or cohabiting and that partner novelty can decrease boredom and increase sexual arousal (Oliveira et al., 2021;

[1]Osmania University, Hyderabad, India
[2]Assistant Professor
*Corresponding Author

Morton & Gorzalka, 2014). However, this sensation-seeking can also lead to risky sexual behavior (McCoul & Haslam, 2001). Given the idea that boredom stems from attention failure (Eastwood et al., 2012), this study proposes to explore the moderating effect of mindfulness on sexual boredom. Despite increased visibility of sexual boredom in popular media, empirical research on the topic is limited and has received little attention outside of sociological, socio-biological, and therapeutic accounts (Hawkes, 1996; Symons, 1992; Stoller, 1979; Wilson, 1988; Kaplan, 1995).

Mindfulness, defined as a non-judgmental focus on the present moment (Kabat-Zinn, 1994), has been shown to reduce negative affect and increase well-being (Campbell-Sills et al., 2006a; Kassdan et al., 2006). Boredom, on the other hand, is often associated with negative experiences such as decreased quality of life (Klapp, 1986) and a perception of time slowing down (Blaszczynski et al., 1990), but can also lead to positive outcomes like creativity (Kets de Vries, 2014) and self-awareness (Biceaga, 2006). Given the potential for mindfulness to counteract the negative aspects of boredom while preserving its positive features, this study seeks to examine its impact on sexual boredom.

Past research has explored the relationship between dispositional mindfulness and boredom proneness (Farmer & Sundberg, 1986; LePera, 2011) and the moderating effects of mindfulness on boredom (Koval & Todman, 2015; Waterschoot et al., 2021). However, the impact of mindfulness on sexual boredom has yet to be systematically explored. Building on previous findings, this study aims to fill this gap in the literature and shed light on the relationship between mindfulness, passionate love, and sexual boredom.

The relationship between mindfulness and sexual well-being has also been studied, with findings suggesting that greater mindfulness during sexual activities leads to improved sexual well-being (Leavitt et al., 2021). Specifically, a woman's sexual mindfulness was linked to her orgasm consistency, as well as her partner's sexual mindfulness (Leavitt et al., 2021). Mindfulness has also been shown to improve sexual pleasure by enhancing the connection between sexual arousal and genital response (Brott et al., 2016). These findings highlight the importance of mindfulness in sexual experiences and the potential benefits of incorporating mindfulness into one's sexual practices.

The present study aims to examine the relationship between passionate love and sexual boredom among Indian heterosexual adults, and the role of mindfulness as a moderating factor. The following objectives were established:
1. To assess the correlation between the levels of passionate love and sexual boredom in Indian heterosexual adults;
2. To determine the predictive value of passionate love on sexual boredom;
3. To examine the impact of mindfulness on the relationship between passionate love and sexual boredom;
4. To assess the relationship between mindfulness, passionate love, and sexual boredom;
5. To explore the correlation between mindfulness and passionate love with regards to sexual boredom.

Based on the objectives, the following hypotheses were proposed:
1. A decline in passionate love is associated with an increase in sexual boredom;
2. Passionate love and mindfulness are positively correlated;

3. Passionate love and mindfulness are negatively related to sexual boredom.

The following operational definitions were used in this study:

- **Passionate love:** A state characterized by intense desire for union with a partner, accompanied by physical arousal, in which reciprocation leads to fulfillment and ecstasy.
- **Mindfulness:** A persistent and non-judgmental awareness of one's thoughts and feelings in the present moment, increasing sensitivity to novelty in everyday experiences.
- **Sexual boredom:** The tendency to experience boredom in regards to sexual aspects of life, including sexual monotony and sexual stimulation.

REVIEW OF LITERATURE

The present study is anchored in the Attachment Theory, which posits that individuals have an innate need for attachment and intimacy, and that the quality of early attachment experiences shapes the development of attachment patterns in adulthood (Bowlby, 1969). This theory suggests that individuals form various attachment styles, such as secure, anxious, or avoidant, which influence their thoughts, feelings, and behaviours in close relationships (Ainsworth et al., 1978).

The study of love, sex, and mindfulness is also influenced by the concept of mindfulness. Mindfulness refers to a non-judgmental awareness of the present moment (Brown & Ryan, 2003) and has been shown to enhance emotional regulation and relationship satisfaction (Barnes et al., 2007). It may be particularly relevant in the context of individuals facing sexual boredom and challenges in their romantic relationships.

Passionate love has been defined in the field of social psychology as a state of intense longing for union with another person (Hatfield & Walster, 1978). This emotion is commonly referred to by various names such as "mania" (Lee, 1977), "limerence" (Tennov, 1979), "puppy love," "a crush," "lovesickness" (Money, 1980), "obsessive love," "infatuation," or "being in love." The Passionate Love Scale (PLS) is widely used to measure passionate love and its various cognitive, emotional, and behavioral dimensions (Hatfield & Sprecher, 1986; Greenwell, 1983; Easton, 1985; Sullivan & Landis, 1984; Sullivan, 1985).

Studies show a close link between passionate love and sexual desire. For example, Sprecher (1985) found that men and women's passionate love for their partners was positively correlated with their level of sexual excitement for their partners (correlation = 0.49) in a sample of 779 individuals involved in intimate love relationships.

Primatologists have argued that passionate love is a primitive phenomenon seen in non-human primates such as Pigtail Macaques (Rosenblum & Plimpton, 1981; Rosenblum, 1985). Infants in these species must cling to their mothers to avoid separation and potential death, leading to a "desire for union" being hardwired into all primates. Similar patterns of attachment, separation, and loss have been observed in children as well (Ainsworth et al., 1978; Bowlby, 1973).

There is some evidence to suggest that the potential for passionate love may be inherent to the species (Bowlby, 1973). However, the factors that stimulate or dampen this emotion are yet to be fully explored by researchers.

Nature of passionate love

The relationship between the mind and body in shaping emotional experiences has been well established in the scientific literature. Research has shown that cognitive factors such as personal experiences, societal norms, and learned behavior play a role in how individuals label their feelings (Hatfield & Walster, 1978). On the other hand, physiological factors determine the intensity and type of emotions felt (Hatfield & Walster, 1978).

The concept of passionate love has been a topic of debate among artists and intellectuals for centuries. Early research suggested that passionate love was a purely positive experience fueled by positive reinforcements (Kendrick & Cialdini, 1977). However, more recent research has revealed a more complex nature of passionate love, as it often involves a mixture of positive and negative emotions such as euphoria, anxiety, and despair (Berscheid & Hatfield, 1969). Passionate love is often linked to excitement, which can trigger a roller-coaster of emotions (Hatfield & Walster, 1978).

In some cases, individuals may become entangled in love affairs that are characterized by brief moments of delight and long periods of pain, uncertainty, jealousy, and despair (Ansen, 1985). Research suggests that the risks associated with passionate love can contribute to its intensity, as it can be fueled by hope, loneliness, mourning, and terror (Hatfield & Walster, 1978).

The Duality of Passionate Love

Passionate love is often viewed as a mixed experience of both pleasure and pain. This literature review examines the research on the dual nature of passionate love, drawing from the works of Tennov (1979) and Liebowitz (1983). Tennov's interviews with over 500 lovers revealed that most people believe passionate love (also known as "limerence") involves both misery and ecstasy. Liebowitz's description of passionate love highlights the excitement and stimulation it brings, as well as the emotional turmoil that arises from uncertainty or unrequited love. These works highlight the complexity of passionate love, with its potential for both intense pleasure and intense suffering.

Tennov's Study: In 1979, Tennov interviewed over 500 lovers and found that most people assumed passionate love was a mixture of both pleasure and pain. She labelled this type of love as "limerence", and found that it was often characterised by intense longing for union with another person, regardless of whether that longing was reciprocated or not.

Liebowitz's Description: Liebowitz (1983) provided a detailed description of the dual nature of passionate love. He described it as a powerful activator of pleasure, with being with or thinking of the loved one being highly stimulating. At the same time, uncertainty or unrequited love can lead to anxiety and emotional turmoil, creating a situation of great emotional upheaval.

This literature highlights the complexity of passionate love and its potential for both pleasure and pain. The works of Tennov and Liebowitz demonstrate that passionate love is often viewed as a mixture of ecstasy and misery, with the experience being dependent on the

reciprocation and certainty of the relationship. These studies emphasise the importance of considering both the positive and negative aspects of passionate love when studying this powerful emotion.

The Neuropsychological Underpinnings of Passionate Love and Sexual Desire
Recent advancements in neuroscience have provided a wealth of information about the nature of love, including its neuroanatomical and neurophysiological basis, the effects of ablations, the role of pharmacology, and the results of clinical and behavioral investigations (Kaplan, 1979; Liebowitz, 1983). This research highlights the close relationship between passionate love and sexual desire, with social psychologists equating the two. However, these findings also suggest that passion can be a complex and sometimes conflicting experience.

The Anatomy of Passionate Love
According to Kaplan (1979), the anatomy of passionate love and sexual desire is well understood and centers around the brain's sex center, which is located within the limbic system and has connections with other parts of the brain, such as the pleasure and pain centers. The pleasure centers have chemical receptor sites that respond to endorphins, which cause euphoria and alleviate pain, while the pain centers take priority over pleasure. Kaplan noted that cognitive factors also play a significant role in sexual desire as the cortex, which analyses perceptions and stores memories, has extensive connections with the sex center. In other words, our emotions, motivations, and experiences shape our sexual desire (Kaplan, 1979).

Passionate love is a complex emotion that has been the subject of much research in psychology. One researcher who has been particularly vocal about the chemistry of passionate love is Liebowitz (1983). He argues that the giddy feeling associated with passionate love is caused by phenylethylamine (PEA), an amphetamine-related compound, which has mood-lifting and energizing effects. According to Liebowitz, this feeling is comparable to an amphetamine high and people who are "love addicts" have much in common with drug addicts. He further speculates that the crash that follows a breakup is similar to amphetamine withdrawal, and that monoamine oxidase inhibitors (MAOIs) may help stabilize the lovesick by inhibiting the breakdown of phenylethylamine.

Aside from PEA, Liebowitz also identifies other chemicals that play a role in the highs and lows of passionate love. For example, he argues that naturally occurring brain chemicals similar to stimulants produce the "rush" of love, while chemicals related to the narcotics, tranquilizers, sedatives, or alcohol produce relaxation. Meanwhile, chemicals similar to psychedelics produce spiritual peak experiences. On the other hand, separation anxiety, panic attacks, and depression may arise from withdrawal from these chemicals or from chemicals that produce these feelings on their own.

However, the validity of Liebowitz's speculations on the chemistry of love has not yet been established. Kaplan (n.d.) provides some information on the chemistry of sexual desire, which is closely related to passionate love. He observes that testosterone and dopamine play a role in sexual desire, while serotonin and 5-HT act as inhibitors. He notes that love itself is a powerful sexual stimulant, but it can be inhibited by fear and pain.

Love, Sex & Mindfulness: Exploring the Interplay of Mindfulness with Passionate Love & Sexual Boredom (A Study of Indian Heterosexual Population)

In recent years, neuroanatomical and neurophysiological research has suggested that emotions are more closely linked than previously thought (Zillman, 1984). For instance, Hatfield and Walster (1978) concluded that passion can be ignited by both pleasure and pain, and that people can move from elation to terror to despair in a matter of seconds in a passionately exciting encounter. These findings highlight the complex interlinkages between emotions and the role of various chemicals in shaping our experiences of passionate love.

Boredom and Sexual Boredom
Farmer and Sundberg (1986) defined boredom proneness as the tendency to experience boredom, a fleeting psychological state characterized by perceived unstimulating, repetitive, or monotonous environment (Chaney & Chang, 2005; Fahlman et al., 2013; Leary et al., 1986). Research has identified two main sources of boredom: low levels of perceived environmental stimulation and inability to create interesting activities for oneself (Bruursema et al., 2011; Gana & Akremi, 1998; Vodanovich & Kass, 1990). Boredom can lead to decreases in judged hedonic value (Berlyne, 1970), behavioral purposelessness (Fenichel, 1951), sensation seeking behaviors, disinhibition (Zuckerman, 1979), and impulsiveness (Moynihan et al., 2017).

Sexual boredom, first defined as the tendency to experience boredom with the sexual aspects of life including sexual monotony and stimulation (Watt & Ewing, 1996), was later redefined as boredom with boring sex in a qualitative study of twelve men in long-term sexually exclusive relationships (Tunariu & Reavey, 2003). Participants in this study and in a later study of men and women in long-term relationships recognized sexual boredom as sexual disinterest, a lack of enthusiasm for sex, and a strong extra-dyadic focus (Tunariu & Reavey, 2007).

Boredom is typically described as an affective-cognitive-motoric state of low arousal and dissatisfaction resulting from a mismatch between what is desired or required and what is actually available (Mikulas & Vodanovich, 1993). It is likely to occur when the individual feels compelled to remain in an inadequately stimulating situation (Barmack, 1937; Berlyne, 1967; O'Hanlon, 1981; Leary et al., 1986). Factors associated with increased susceptibility to boredom include sensation seeking personality, high scores on the Boredom Proneness Scale, high need for novel stimulation, rapid rate of habituation, less creative interaction styles, low attentional capacity, low scores on the Boredom Coping Scale, and a tendency to use stable and less complex attributions for boredom (Farmer & Sundberg, 1986; Martindale et al., 1996; Polly et al., 1993; Zuckerman, 1979).

Although boredom is often seen as a privately owned characteristic that becomes observable across specific situations, it is important to consider the social considerations that contribute to producing the representations used to make sense of boredom (Barbalet, 1999). Sexual boredom, considered to be more of a male attribute (Watt & Ewing, 1996), has limited psychological literature with a strong reliance on viewing a decline from initial interest in a sexual partner to a state of boredom with sex.

Correlates with variables of sexuality
The relationship between sexual boredom and other aspects of sexuality has been the subject of numerous studies. Boredom proneness has been shown to be positively correlated with various forms of sexual behavior, such as a greater variety of sexual activities, greater number of sexual partners, solitary sexual behavior, and risky sexual behavior (Zuckerman

et al., 1972; Gana et al., 2001; Chaney & Blalock, 2006; Donohew et al., 2000; Greene et al., 2000; Bancroft et al., 2003, 2004; Reid et al., 2011; Downing Jr et al., 2014; Kraus et al., 2017; Zlot et al., 2018). Despite these findings, the link between boredom and hypersexuality is not fully established (de Oliveira & Carvalho, 2020). Boredom proneness was also positively correlated with sexual boredom (Watt & Ewing, 1996) and infidelity (Gigy & Kelly, 1993; Gillen, 2013; Brand et al., 2007).

Studies have also shown that sexual boredom is negatively correlated with sexual satisfaction, sexual desire/interest, and sexual novelty, while positively correlated with responsive sexual desire, masturbation, and hypersexuality (Carvalheira et al., 2014, 2015; Štulhofer et al., 2010, 2013, 2016; Zamboni & Crawford, 2003; Klein et al., 2015; Štulhofer et al., 2008, 2016; Rosa et al., 2019). However, individuals with low levels of sexual boredom and high levels of sex-positive traits reported higher levels of sexual novelty in their romantic relationships (Matthews et al., 2018).

The gender gap in sexual boredom
The literature on sexual boredom has suggested that it is more common among men than women (Polly et al., 1993; Tunariu & Reavey, 2007; Watt & Ewing, 1996). Evolutionary psychology (Buss & Schmitt, 1993) provides a potential explanation for this gender difference, proposing that male sexual boredom stems from their tendency to engage in reproductive promiscuity, seeking novelty after sexual satiation with one partner (Dewsbury, 1981). However, this framework does not offer an explanation for sexual boredom among women. This literature review highlights the need for further research to understand the underlying causes of sexual boredom among both men and women.

The Connection between Dispositional Mindfulness and Boredom Proneness
Dispositional mindfulness, also known as trait mindfulness, refers to an individual's general level of mindfulness in daily life (Brown, Ryan, & Creswell, 2007; Rau & Williams, 2016). This construct is distinct from cultivated mindfulness, which is the ability to achieve a state of mindfulness through mindfulness meditation practices (Rau & Williams, 2016). The components of dispositional mindfulness include observing experiences, labeling perceptions, present awareness, non-judging of thoughts and emotions, and non-over-reactivity (Baer et al., 2004). The findings consistently show a significant negative correlation between dispositional mindfulness and boredom proneness, with an estimated correlation of r = -0.50 (Farmer & Sundberg, 1986; LePera, 2011; Ramon, 2017; Struk et al., 2017). This connection can be explained by the capacity or practice of directing attention to the present moment, which is a key aspect of both dispositional mindfulness and boredom proneness (Baer, 2003; Kabat-Zinn, 1994).

The experience of boredom is associated with numerous negative clinical and physical outcomes (Sommers & Vodanovich, 2000). However, little research has investigated the potential role of trait variables, such as neuroticism, inattention, emotional awareness, and impulsivity, in explaining the relationship between boredom proneness and psychological problems (Mercer-Lynn, Hunter, & Eastwood, 2013). This literature review aims to synthesize the current understanding of the relationship between boredom proneness and dispositional mindfulness.

Boredom proneness refers to the tendency to experience boredom easily and frequently (Sommers & Vodanovich, 2000). This construct has been linked to a range of negative

outcomes, including depression, anxiety, low life satisfaction, and poor physical health (Sommers & Vodanovich, 2000). Despite the growing recognition of the importance of studying boredom proneness, research in this area remains limited (Mercer-Lynn, Hunter, & Eastwood, 2013).

Dispositional mindfulness, on the other hand, is defined as a personality trait characterized by non-judgmental focus on the present moment, feelings, or thoughts (Biegel, Brown, Shapiro, & Schubert, 2009). This trait has been shown to have numerous benefits, including reduced stress and anxiety, improved well-being, and increased emotional regulation (Biegel et al., 2009). Despite the growing body of research on dispositional mindfulness, little is known about its potential role in explaining the relationship between boredom proneness and psychological problems (Mercer-Lynn, Hunter, & Eastwood, 2013).

Given the potential importance of dispositional mindfulness in understanding the negative outcomes associated with boredom proneness, future research should examine the relationship between these constructs more closely. This review highlights the need for more comprehensive investigation of the role of dispositional mindfulness in explaining the negative effects of boredom proneness and underscores the importance of continued research in this area.

METHODOLOGY

Study Design

This quantitative study, within the correlational analysis framework studies mindfulness as a moderator i.e., the third variable affecting the correlation between other two variables i.e., passionate love the hypothesized predictor of sexual boredom as depicted in figure 1.

Fig 1.: Showing the study design of the project
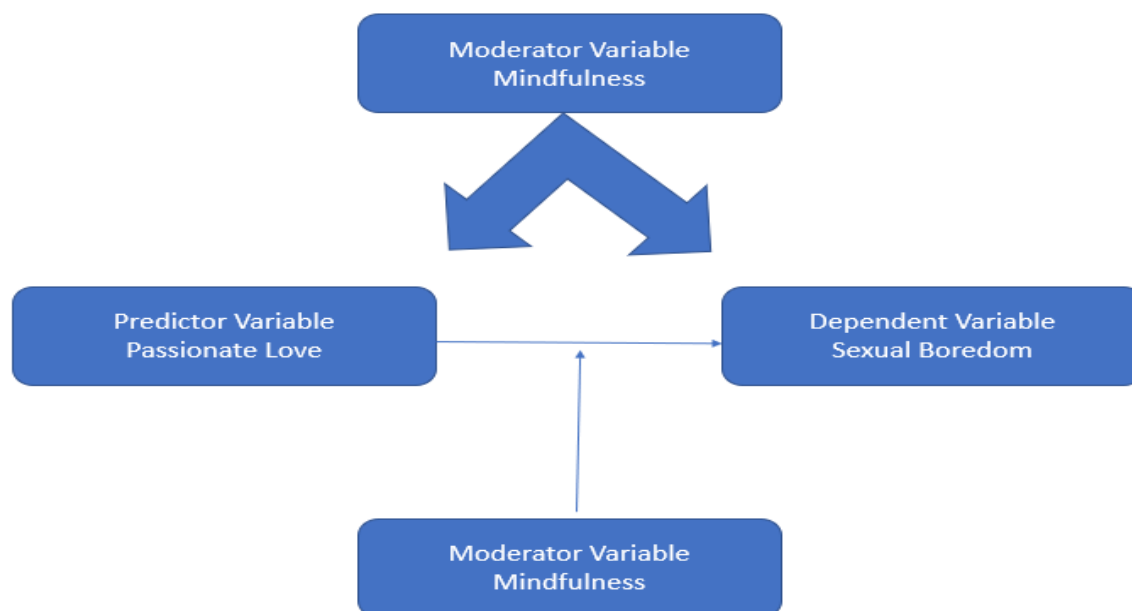
Participants

After taking informed consent 100 participants with overall good physical & mental health were randomly recruited via placing an advertisement on a social networking site.

Inclusion Criteria:
Heterosexual Indian adults age 22 to 51 years of age, who are in a monogamous relationship for at least one year. Based upon past literature review. (Bruursema, Kessler, & Spector, 2011; Gana & Akremi, 1998; Vodanovich & Kass, 1990)

Exclusion Criteria:
Participants who are in a physical or mental state which has clinical evidence of interfering with sexual desire (example- menopause, depression). Participants with non-binary sexual orientation, participants who are Indian nationals but are not residing in India since past one year. Participants experienced overwhelming emotions and discomfort while filling the questionnaire.

The demographic details of the participants
Figure 2: Showing the age distribution of the participants:

Age
100 responses

Figure 3: Showing the area of residence of the participants
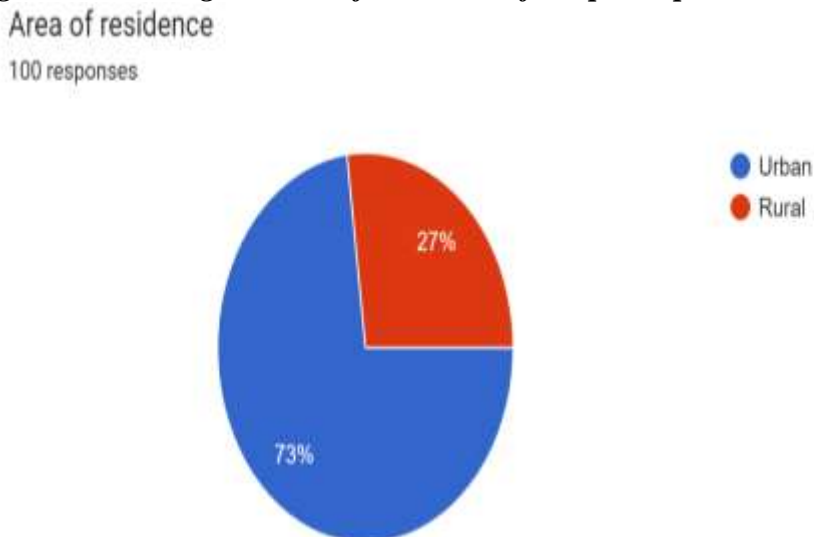
Area of residence
100 responses

Figure 4: Showing the gender of the participants

Gender

100 responses
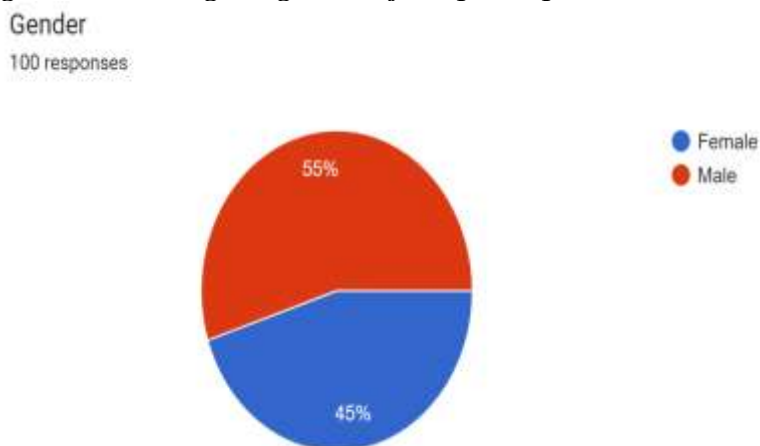
Figure 5: Showing the age of the partners of the participants

Age of partner

100 responses
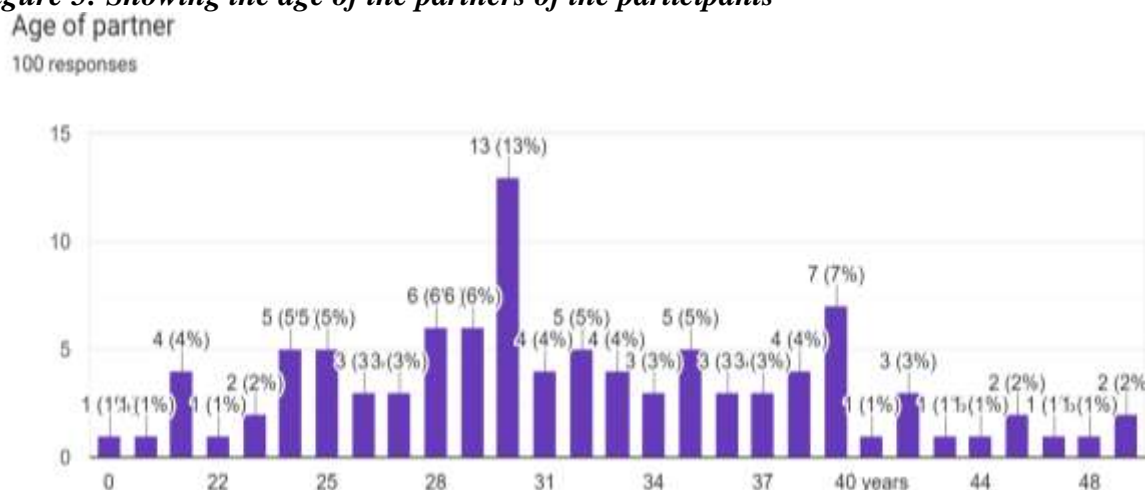
Figure 6: Showing the parental consent of the relationship of the participants
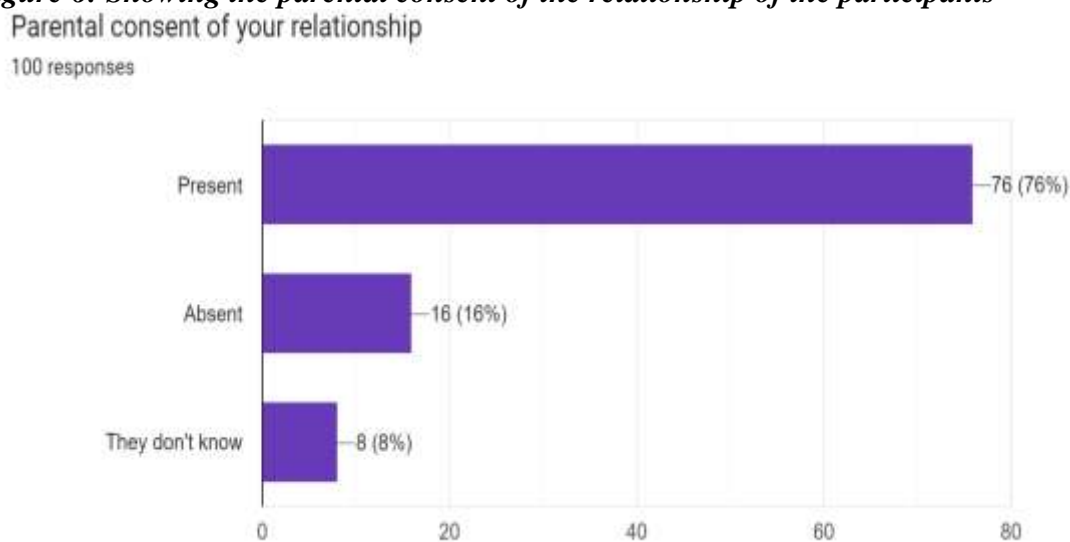
Parental consent of your relationship

100 responses

Figure 7: Showing the occupation of the participants

100 responses

- Self-employed
- Government Sector
- Corporate job
- Academia
- Currently not working
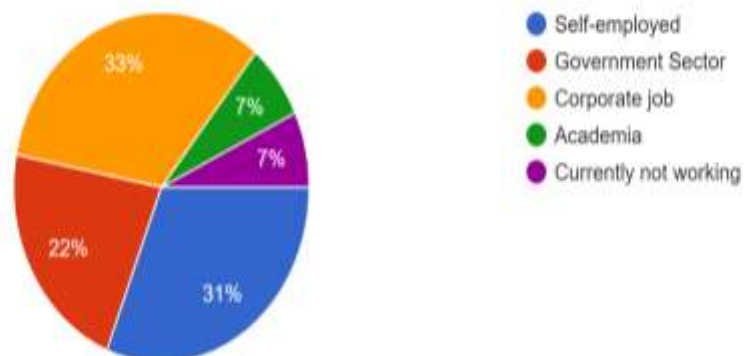
Figure 8: Showing the occupation of the partners of the participants

Partner's Occupation
100 responses

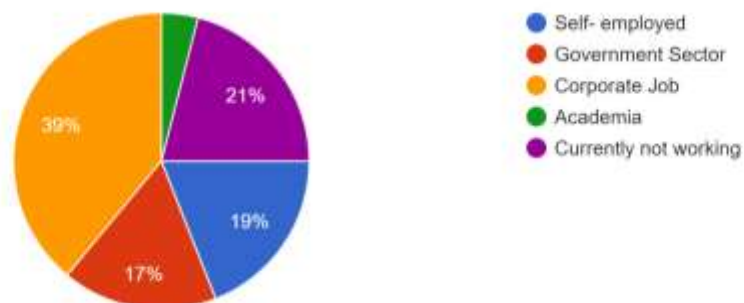- Self- employed
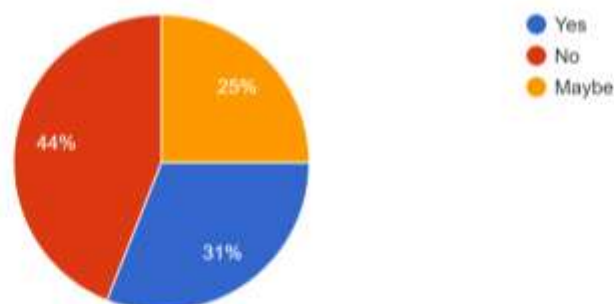- Government Sector
- Corporate Job
- Academia
- Currently not working

Figure 9: Showing the percentage of infidelity in the participants:

Have you ever been infidel to your partner?
100 responses

- Yes
- No
- Maybe

Procedure

The recruitment advertisements were placed on social media site- Twitter. Out of 1,134 engagements, 267 participants met the study criteria. Through random sampling participants 100 participants were enrolled in the study. Due to the sensitive nature of the study in Indian

cultural context, the data was gathered online, allowing anonymity to the participants, in order to reduce the social desirability bias in the reponses. Three questionnaires- Passionate Love Scale, Sexual Boredom Scale & Five Facet Mindfulness Questionnaire was administered on the participants.

Measures
The Passionate Love Scale: The Passionate Love Scale (PLS) is a tool for measuring the cognitive, emotional, and behavioural components of passionate love. Developed by Hatfield and Sprecher (1986), the PLS was created to encourage research into this intense type of love, which is characterized by intense longing, idealization, positive and negative emotions, and behavioural actions towards the partner. The PLS consists of 15 items, which participants rate on a scale of 1 to 9, with higher scores indicating greater passionate love. The scale has been found to be reliable, with coefficients alpha of .91 for the 15-item version and .94 for the 30-item version, and valid, with evidence of positive correlations with similar measures. The PLS has been used in a wide range of research studies on topics such as cross-cultural differences in passionate love, neural bases of passionate love, and changes in passionate love over time.

The Passionate Love Scale (PLS) is being used in this research to assess the intensity of passionate love in the participants. As passionate love is one of the main variables being studied, the PLS provides a valid and reliable measure to capture the cognitive, emotional, and behavioral components of this type of love. This information can then be used to examine the moderating effects of mindfulness on passionate love and sexual boredom, allowing for a more nuanced understanding of the relationship between these variables.

Sexual Boredom Scale (SBS): The study assessed the sexual boredom of the participants using the Sexual Boredness Scale (SBS), a self-report measure designed by Watt & Ewing (1996) to capture the extent of boredom with the sexual aspect of one's life. This 18-item scale was designed for sexually active non-psychiatric populations and responses were recorded on a 7-point Likert scale, with a range of 1 (strongly disagree) to 7 (strongly agree). Higher scores on the SBS reflect higher levels of sexual boredom.

The SBS comprises two 9-item subscales: "Sexual Monotony" and "Sexual Stimulation". The first assesses sexual routine and tedium, for instance, the statement "Sex frequently becomes an unexciting and predictable routine", while the second evaluates aspects of sexual excitement and constraint, such as "I would not stay in a relationship that was sexually dull". The original authors reported high internal consistency for the total score across their samples, with Cronbach's alpha values ranging from .92 to .95. The current study also obtained a high reliability, with a Cronbach's alpha of .93.

Five Facets Mindfulness Questionnaire: The Five Facet Mindfulness Questionnaire (FFMQ-15) is a self-reported scale that gauges mindfulness in daily life through 15 questions. The scale assesses five facets of mindfulness: Observing, Describing, Acting with Awareness, Non-judgment, and Non-reactivity.

Studies have shown that the FFMQ-15 is a predictor of positive thinking, a better mood, and overall well-being. The scores of the five facets provide a reliable measure of mindful self-awareness and can assess the effectiveness of mindfulness interventions. The FFMQ-15 is suitable for use with both clinical and non-clinical populations 16 years and older.

The items for the FFMQ-15 were selected from a longer scale, the FFMQ-39. The five facets of the FFMQ-15 demonstrated adequate to good internal consistency, with alpha coefficients ranging from .75 to .91. The measure was found to be sensitive to change in Mindfulness-Based Cognitive Therapy (MBCT). Normative data was obtained from 538 ethnically diverse college students by Kim et al. (2021).

The scoring and interpretation of the FFMQ-15 involves calculating average scores, which are obtained by summing the responses and dividing by the number of items. The average scores range from 1 (rarely true) to 5 (always true), with higher scores indicating a higher level of mindfulness in daily life. The five facets of the FFMQ-15 include: Observation, Describing, Acting with Awareness, Non-judgmental, and Non-reactivity.

Percentiles are also computed in comparison to a young adult sample (Kim et al., 2021), allowing interpretation of a respondent's pattern of responding in comparison to a non-clinical population. A score at the 50th percentile, for example, indicates an average level of mindfulness for non-clinical individuals.

RESULTS

The participants' responses (N=100) were scored according the manual of the respective measures to ascertain the percentage of participants with high scores on each of the variables- sexual boredom, passionate love and mindfulness as illustrated in table 1.

Table 1: Showing the percentage of participants with high scores on each variable:

Variable	Percentage of participants
Sexual Boredom	46%
Passionate Love	45%
Mindfulness	41%

R-software is used to build an analytical model of data and two analyses were done as shown in table 2.

Table 2: Showing the two analyses used in the study:

Analysis	Description	Variables	Hypothesis	Statistical Techniques Used
Analysis 1	Passionate love as a predictor of sexual boredom	IV= Passionate Love DV= Sexual Boredom	Passionate love is a predictor of sexual boredom	Split ratio, Exploratory analysis, Simple Regression, Root Square Mean Error calculations, absolute variance of test data v/s predicted value
Analysis 2(a)	Mindfulness as	IV=Passionate	Mindfulness is	Multiple

	moderator of sexual boredom and passionate love (one-directional)	Love DV= Sexual Boredom Moderating Variable= Mindfulness	a moderator of sexual boredom and passionate love	regression
Analysis 2(b)	Moderating effect of mindfulness multiplied by passionate love on sexual boredom	DV= Passionate love DV= Sexual Boredom IV= Mindfulness	Passionate love & mindfulness are positively correlated to sexual boredom and negatively correlated to one another	Correlation

Analysis 1: Passionate love is predictor of sexual boredom
Variables:
y= Sexual boredom (Dependent Variable)
x= Passionate love (Independent Variable)

Analysis:
Data (seed set 123) is used in a split ratio (0.7), so that the distribution (ratio) of y remains the same in the data set created for test and training as shown in table 3.

Table 3: Showing the split-ratio of the data

Set		Split Ratio	Split
Sample split	Sexual Boredom Score	0.7	
Sub-set	Training set		True
Sub-set	Test set		False

After data-splitting (Training data-set= 80 records, Test data-set= 20 records) an exploratory analysis was done using 100 observations of the two variables- sexual boredom score and passionate love score; and its histogram was plotted. It was observed from the histogram that the data is skewed (Skewness, Passionate Love Score=0.101597).
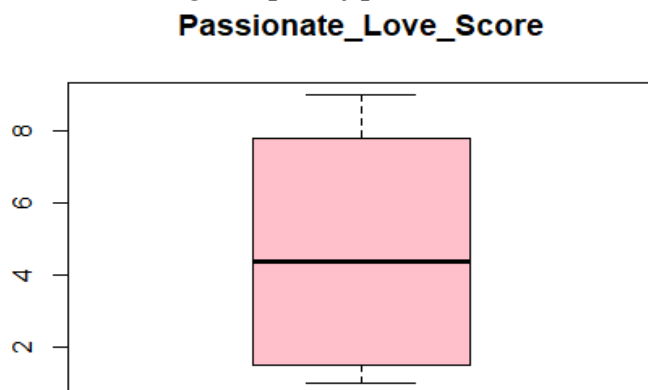
Figure 10: Showing the histogram of exploratory analysis of passionate love score:
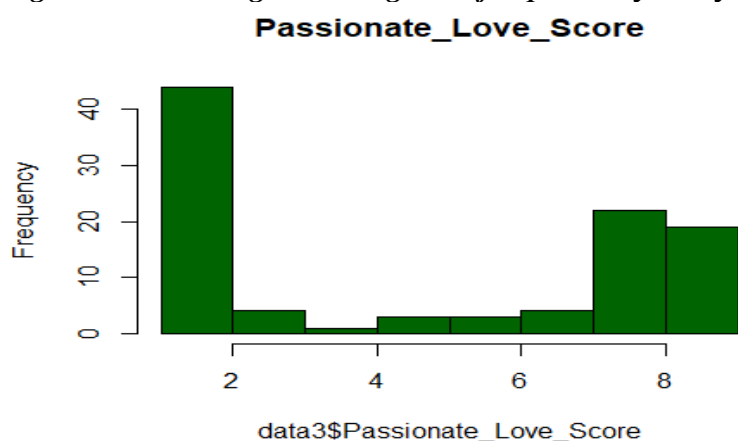
To check for outliers, a box-plot was plotted for the data and it may be observed from figure 10 that despite being skewed there are no outliers in the data. Therefore, implying that the data can be treated.

Figure 11: Showing box-plot of passionate love score

The data was treated with square root- we did the square root of the data set i.e. both passionate love and sexual boredom. It was plotted again and as it may be observed that the skewness has reduced.

Figure 12: Histogram showing the treated data-set
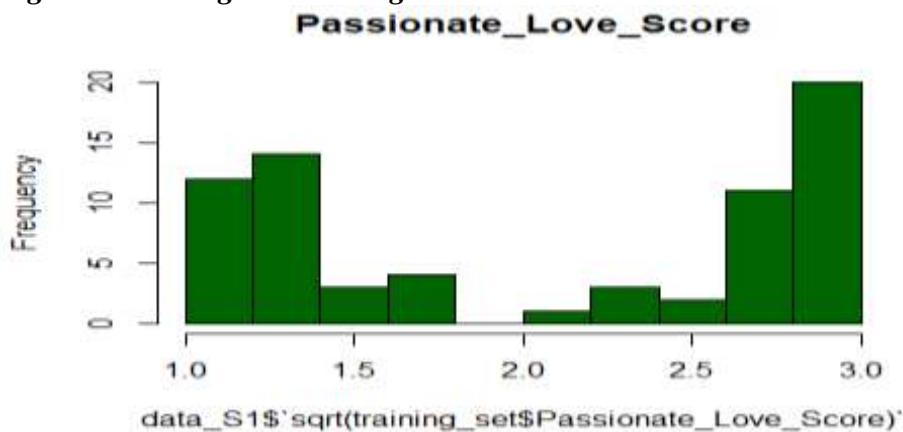
The data was then checked on training-set data & test-set data. Then, simple-regression was applied on the training-set data, which can be summarized in table 2 and table 3.

Table 4: Showing the summary of simple regression on training-set data:

		Passionate Love Score	Sexual Boredom Score
Min.		1.000	1.000
Quartile I (Lower Quartile, 25% of data-points)		1.525	2.500
	Median	5.600	5.300
	Mean	4.880	4.533
Quartile III (Upper Quartile, 75% of data-points)		8.000	6.500
	Max.	9.000	7.000

Table 5: Showing the coefficients of simple linear regression

| Coefficients (Estimate Std. Error t value Pr(>|t|), p value= [0, 0.001]	
Intercept	3.32677　0.08806　37.78　<2e-16 ***
Passionate Love Score	-0.61023　0.03986　-15.31　<2e-16 ***

It can be observed from table 3 that the coefficient of regression for x (Passionate love) is negative. Negative implies that levels of passionate love are inversely proportional to the level of sexual boredom. To learn how the values fit on the line of regression, residual plots of the regression model were created.

Figure 13. Residual Plots of the regression model, representing how the values fit on the line of regression
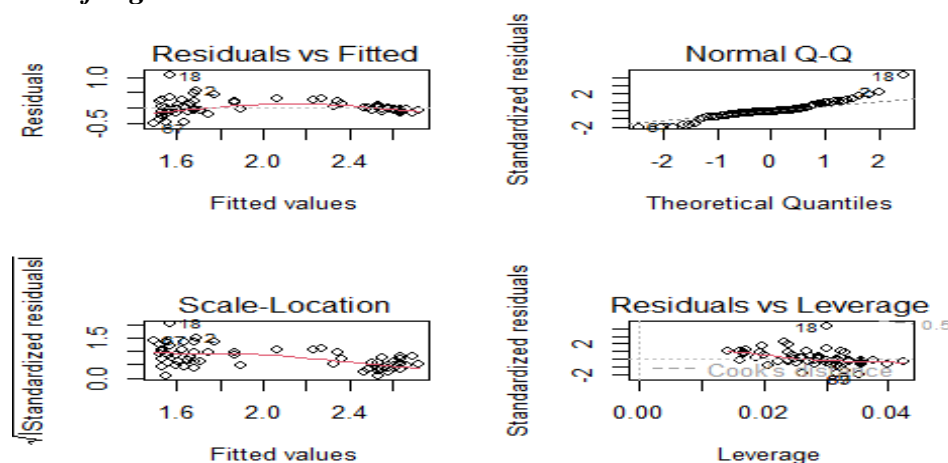
A comparison between original data-set and data-set after regression equation is drawn demonstrates that sexual boredom (x) is dependent on passionate love (y). The line drawn on the data-set showed the predicted values.

Figure 14: Showing the regression model of Passionate Love as predictor of Sexual Boredom
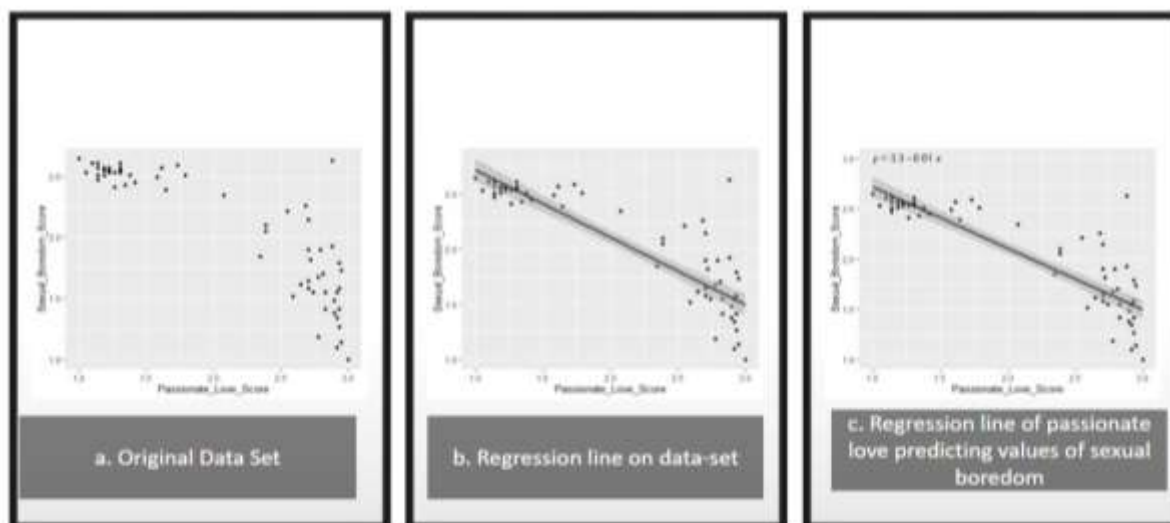
To test the accuracy of this model, the line obtained from the data-set (figure 13) was checked for accuracy on the test data set. Line obtained from training data set was checked for accuracy on test data set (30 observations of the three variable- sexual boredom, passionate love, mindfulness). The value of sexual boredom and the predicted value was taken and variance was calculated. Root square mean error was tested (RSME), this error is inversely proportional to robustness & validity of the model. Here, RSME= .18 which indicates high robustness of this model.

To retest the accuracy, it was also calculated on Microsoft excel: Absolute variance was calculated for Actual value (test data) v/s predicted value (the analytical model obtained through line of regression). It was 92%. This very good especially since y (sexual boredom) is a continuous variable and for a continuous variable infinite values can come as illustrated in table 6.

Table 6: Showing the test-predictions of passionate love on sexual boredom:

| Passionate Love Score	Sexual Boredom Score	Predicted Values from Model	Variance	Accuracy	By regression Equation Y= 3.3 - 0.6X
2.664582519	2.097617696	1.7	0.3976177	81%	1.701250489
2.792848009	1.61245155	1.6	0.0124515	99%	1.624291195
2.588435821	2.049390153	1.7	0.3493902	83%	1.746938507
2.664582519	1.549193338	1.7	0.1508067	90%	1.701250489
2.828427125	1.414213562	1.6	0.1857864	87%	1.602943725
2.75680975	1.643167673	1.6	0.0431677	97%	1.64591415
2.097617696	2.144761059	2	0.1447611	93%	2.041429382
2.880972058	1.378404875	1.6	0.2215951	84%	1.571416765
2.121320344	1.702938637	2	0.2970614	83%	2.027207794
2.792848009	1.483239697	1.6	0.1167603	92%	1.624291195
2.774887385	1.58113883	1.6	0.0188612	99%	1.635067569
2.738612788	1.897366596	1.7	0.1973666	90%	1.656832327
1.140175425	2.50998008	2.6	0.0900199	96%	2.615894745
1.341640786	2.48997992	2.5	0.0100201	100%	2.495015528
1.224744871	2.569046516	2.6	0.0309535	99%	2.565153077
1.183215957	2.529822128	2.6	0.0701779	97%	2.590070426
1.095445115	2.569046516	2.7	0.1309535	95%	2.642732931
1.048808848	2.645751311	2.7	0.0542487	98%	2.670714691
1.140175425	2.607680962	2.6	0.007681	100%	2.615894745
1.378404875	2.529822128	2.5	0.0298221	99%	2.472957075
1.378404875	2.569046516	2.5	0.0690465	97%	2.472957075
1.183215957	2.588435821	2.6	0.0115642	100%	2.590070426
1.378404875	2.449489743	2.5	0.0505103	98%	2.472957075
1.341640786	2.469817807	2.5	0.0301822	99%	2.495015528
1.224744871	2.387467277	2.6	0.2125327	91%	2.565153077
1.224744871	2.549509757	2.6	0.0504902	98%	2.565153077
1.183215957	2.50998008	2.6	0.0900199	96%	2.590070426
1.183215957	2.569046516	2.6	0.0309535	99%	2.590070426
2.983286778	1.140175425	1.5	0.3598246	68%	1.510027933
3	1	1.5	0.5	50%	1.5
			Accuracy	**92%**	

Analysis 2: Dispositional Mindfulness as a moderator:
Variables:
y= sexual boredom (Dependent Variable)
 x= passionate love (Independent Variable)
z= mindfulness (Moderator Variable)

The moderator variable was introduced in two ways: one directly as dispositional mindfulness (z) and secondly multiplied by passionate love (xz), as shown in figure 14.

Figure 14: Showing the two ways of introducing mindfulness as a moderating variable in the analysis:
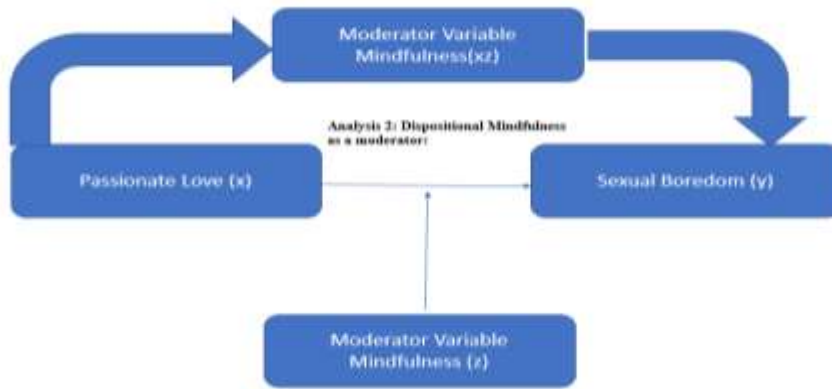
Analysis 2(a): One-directional introduction of mindfulness as a moderating factor
To study the moderating effect of mindfulness on passionate love and sexual boredom, multiple regression was used and following three lines were obtained as shown in figure 15:

Figure 15: Showing the results of multiple regression of the three variables- Passionate love, mindfulness and sexual boredom:
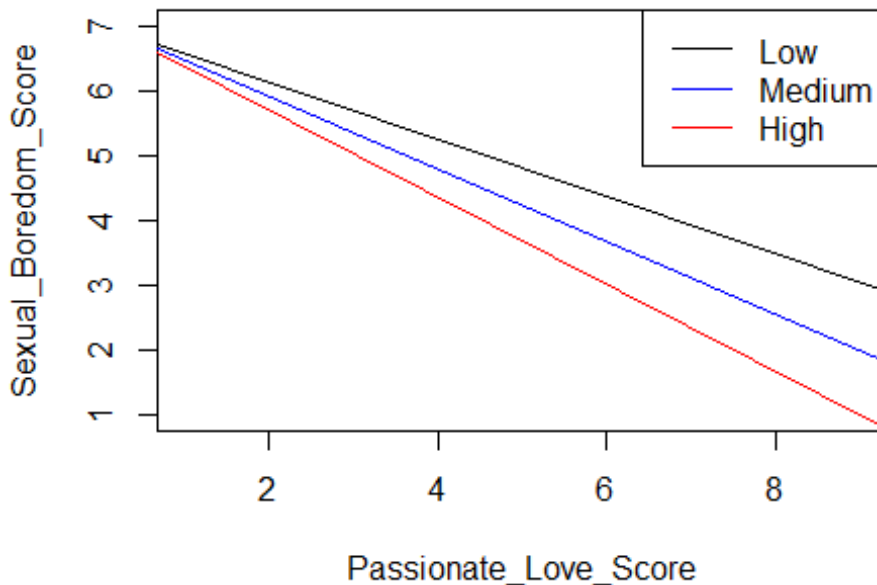
It may be observed from the figure 15 that the blue line denotes mean ($\bar{x}$=2.6), black line denotes mean - 1 standard deviation ($\bar{x}$- 1SD= 1.4), which is indicating the increase in sexual boredom and red line indicates mean +1standard deviation ($\bar{x}$ +1SD=3.7), which is

indicating that when the value of moderating variable (mindfulness) is increased, the sexual boredom has reduced. Therefore, moderator variable is inversely proportional to sexual boredom. Positive change in the levels of mindfulness will have negative impact on the levels of sexual boredom as shown in table 7.

Table 7: Showing the regression equations of moderation analysis:

Regression Equation (y=sexual boredom, x=passionate love, z=mindfulness)	$y=7+0.3x + 0.01z + 0.1xz$
Level of Mindfulness	Regression Equation
1.4	$y=7-0.3x+.01\times1.4-0.1\times1.4x$ $\Rightarrow y=7.014 - 0.44x$
2.6	$y=7-3x+.01\times2.6-0.1\times2.6x$ $\Rightarrow y=7.026-.56x$
3.7	$y=7-3x+.01\times3.7-0.1\times3.7x$ $\Rightarrow y= 7.037-.67x$

Analysis 2(b): Studying the moderating effect of mindfulness multiplied by passionate love on sexual boredom

In this analysis, the passionate love variable becomes a dependent variable, which is multiplied to the moderating variable (mindfulness) to conduct the moderation analysis, through correlation. The results thus obtained are demonstrated in figure 16.

Figure 16: Showing the correlation plot of sexual boredom, passionate love and mindfulness:
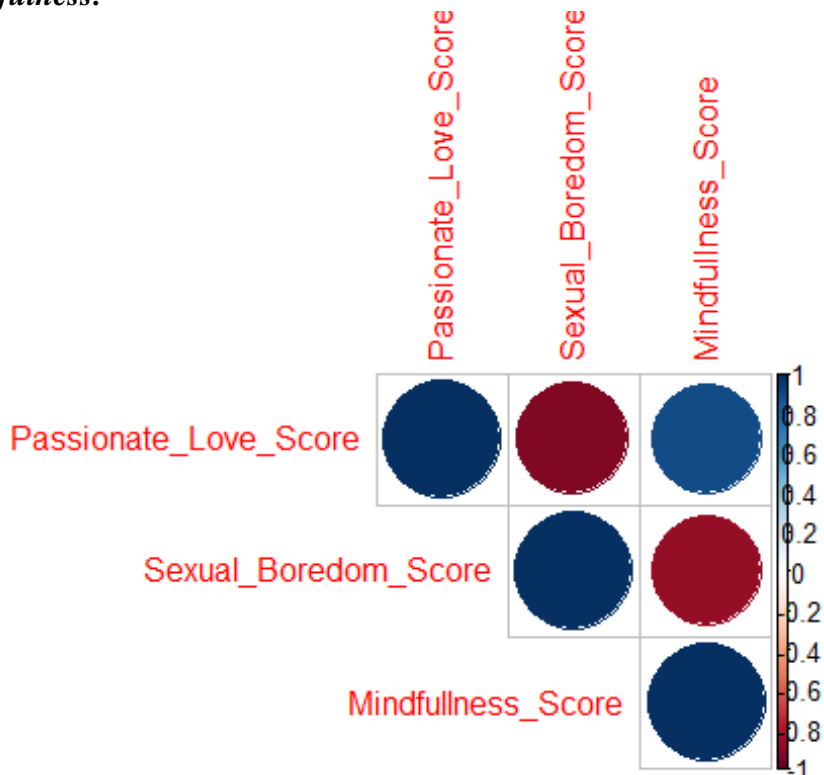

Figure 16 shows the correlation plot (1 to -1) is applied only on continuous variables- Sexual boredom, Passionate Love and Mindfulness. In the plot on 1 to -1 range red indicates negative correlation, white indicate nill and blue indicates positive correlation. Passionate

love and mindfulness are positively correlated to one another and negatively correlated with Sexual Boredom.

DISCUSSION

Hypothesis 1: Passionate love is a predictor of sexual boredom:

The results of analytical model show that passionate love is a predictor of sexual boredom. The equation: y=3.3-0.61x, where y denotes sexual boredom and x denotes passionate love, can be used to predict the value of sexual boredom using passionate love as a predictor. The simple regression analysis (table 2) gave a strong coefficient regression (-0.61023, p-value 0, 0.001, table 3). The negative sign of the coefficient of regression implies that the level of passionate love are inversely proportional to the level of sexual boredom. The accuracy of the model was tested by calculating the absolute variance for the actual test data versus the predicted value i.e., the analytical model obtained through the line of regression. It was found to be 92% accurate. This is considered a very high level of accuracy, since the dependent variable (sexual boredom) is a continuous variable & for a continuous variable infinite values can come. The analytical model's accuracy was also tested on a data set. The value of sexual boredom and the predicted value was taken and variance was calculate, root square mean error (RSME) is inversely proportional to robustness & validity of the model. Here, RSME= .18 which indicates high robustness of this model (fig. 13 & fig. 14).

The splitting of the data in training-set and test-set for the respective developing and testing the analytical model was done by calculating the split-ratio (0.7, Table 1). It was done to ensure that the distribution of the dependent variable (sexual boredom) remains same in the data set created for test and training. Based on the calculations out of 100, 70 observations were used in the training set and 30 observations were used as test-data. Since the data was skewed (fig. 9) but no outliers (fig. 10), it was treated with square root first and then checked on the test & training data set (fig. 11 & ig. 12).

Hypothesis 2: Mindfulness is a moderator of sexual boredom

Mindfulness as a moderator variable was found to be inversely proportional to sexual boredom i.e., positive changes in mindfulness will have negative impact on the levels of sexual boredom. This relationship was obtained by one directionally (fig. 14) introducing mindfulness as moderator in the equation of passionate love & sexual boredom (N=100). Regression lines indicated that as the values of moderating variable (mindfulness) increased the sexual boredom reduced (mean-1 standard deviation i.e ab line 7.014, -.44, fig. 15).

Furthermore, multiplying mindfulness with the passionate love (fig.14), correlation plot (1 to -1) was applied on sexual boredom, passionate love and mindfulness. In the plot on 1 to -1 range red indicates negative correlation, white indicates nill and blue indicates positive correlation. Passionate love and mindfulness are positively correlated to one another and negatively correlated with Sexual Boredom (fig. 16).

CONCLUSION

The relationship between individuals' sexual desires, entitlements, and success as sexual partners, and their responsibilities as loving partners, remains largely unexplored in the psychological literature. Instead, sexual boredom has been viewed as a personality trait (Watt & Ewing, 1996) or as a product of an evolutionary mechanism specific to men's sexuality (Wilson, 1988; Symons, 1992). This study aimed to shed light on the connection

between sexual boredom, passionate love, and mindfulness in an effort to reconcile the conflict between personal sexual needs and the demands of long-term monogamy.

The study found that 31% of participants reported having been unfaithful to their partners, while 25% were uncertain about their answer on the subject. The majority of participants described sexual boredom as dull, routine, monotonous, lacking passion, and temporary. The study revealed that sexual boredom can be predicted by the level of passionate love, with lower levels of passionate love corresponding to higher levels of sexual boredom. Moreover, mindfulness was found to be a moderating factor in the relationship between passionate love and sexual boredom, with levels of mindfulness and passionate love being directly proportional and inversely proportional to sexual boredom, respectively.

Past research has shown that novelty, mystery, and uncertainty, as well as physical and psychological distance, danger, conflict, and hostility, can instigate and enhance sexual passion for both men and women (Stoller, 1979; Person, 1999; Kernberg, 1988; Schwartz, 1994). Conversely, sexual interest and desire have been shown to decrease as familiarity and/or habituation to sexual arousal increase (Lazarus, 1988; Schwartz, 1994; Plaud et al., 1997; Kaplan, 1995). By highlighting mindfulness as a moderating factor in sexual boredom and passionate love, this study presents a novel approach to the issue.

The study has limitations, and a higher degree of sophistication would have been achieved if certain factors were taken into account. Despite its increasing prominence in popular media, empirical studies on sexual boredom in sexual relationships have been limited to measuring individual performance (Watt & Ewing's 1996 Sexual Boredom Scale). Nevertheless, this study opens up new avenues for designing interventions for sexual boredom and presents a promising application of mindfulness in couple therapy. Sexual boredom and loss of sexual interest have been implicated in sexual infidelity (Shackelford & Buss, 1997) and the breakdown of relationships, both in short- and long-term couples (Hill et al., 1976; Counts & Reid, 1986; Gigy & Kelly, 1992). Therefore, further research on the use of mindfulness as an intervention for sexual boredom and passionate love has the potential to make a significant impact on couples' therapy.

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