THE CORRELATION BETWEEN RESILIENCE AND THE LEVEL OF DISTRESS, RUMINATION, AND SLEEP DISTURBANCES OF POST-BREAKUP UNIVERSITY STUDENTS

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Abstract

Engaging in romantic relationships is common among university students. Romantic relationships encourage the students to develop their personal identity, provide opportunities for intimacy, and foster autonomy and independence. Contradicting the values mentioned is the distress the students undergo when breakup occurs, leading to ruminative behaviors and affecting sleep in general. However, breakup distress, rumination, and difficulties in sleep are diverse in accord with each individual inner-self psychological resilience. Therefore, we conducted this study with the aim of understanding the impact of resilience on distress, rumination, and sleep disturbances among post-breakup university students.

A total of 164 samples were collected from different universities in Ho Chi Minh City through paper-based and online surveys (Google Forms). In addition, we conducted 5 individual interviews to obtain the most objective perspective. Research results indicate that: (a) resilience is negatively correlated with post-breakup distress in students, (b) resilience is negatively correlated with post-breakup rumination, and (c) resilience has a negative correlation with sleep disturbances after breaking up. Our findings highlight the importance of psychological resilience as a protective factor against the negative effects of romantic breakups. By enhancing their resilience, college students may better cope with the emotional distress and sleep disturbances that often follow the end of a romantic relationship.

Keywords

Romantic Relationship, Resilience, Breakup Distress, Rumination, Sleep Disturbances

INTRODUCTION

Research problems:

The research focuses on the theory of student involvement, which suggests that learning and personal development can be positively impacted by activities outside of the classroom that students engage in (such as preparing for class, participating in clubs, sports, and engaging in intimate relationships) as long as the student is directed towards enhancing their university experience (Astin, 1999). Nearly 70% of young people report being involved in romantic relationships (Collins, 2003). They spend a lot of time with their significant other, and feelings of intimacy are increased (Reis & et al., 1993). These relationships provide many benefits for mental health, including providing social support, enhancing self-esteem, preparing for mature relationships, and developing intimacy (Collins, 2003) In addition to encouraging a sense of connection with others, romantic relationships also help to form autonomy, personal identity development (Ávila & et al., 2012), and less dependence on parents (Berman & et al., 2006; Furman & Shaffer, 2003).

Nonetheless, breaking up with a romantic partner might also be an unavoidable outcome (Sprecher, 1996) and will possibly be a stressor that can lead to mental health issues in college students (Exner-Cortens, Eckenrode & Rothman, 2013; Joyner & Udry, 2000). Ending a romantic relationship is considered by young adults as the "worst event" they have ever experienced (Monroe & et al., 1999a). It is evident that among college students, breakups occurring among two samples of students resulted in feelings of distress, depression, anxiety, and stress (Field, 2017). However, not everyone facing a challenge will experience negative psychological states. Some

individuals have the ability to adapt and overcome challenges in a positive way (Fitzpatrick, 2010). Resilience is the inherent mental capacity of each person that is reflected in their ability to cope with stress and face challenges (Connor & Davidson, 2003). Resilience is related to a set of attributes that help people succeed and cope effectively when faced with difficulties and challenges (Cyrulnik, 2009). Therefore, the aim of this study is to focus on exploring the correlation between psychological resilience in individuals and events that cause distress, specifically the degree of distress, rumination, and sleep quality after a breakup among college students.

The importance of research:
The issue of post-breakup has been of interest for nearly two decades, and studies on this topic describe some of the main post-breakup effects as feelings of anger (Frazier & Cook, 1993), offense, loneliness (Sprecher, 1994), adjustment problems, stress, and despair (Moller et al., 2003). Among these, stress is considered the most prominent factor (Rhoades et al., 2011). After a breakup, students may experience a decline in function or withdraw from interpersonal relationships (Chung et al., 2002). Additionally, students reported a decreased ability to concentrate, difficulty in completing homework, and a significant decrease in overall academic performance (Field et al., 2017). Furthermore, Fleming et al (2010) found an increase in the use of alcohol, marijuana, and tobacco after the end of romantic relationships in young adults. Moreover, post-breakup distress may lead to the risk of developing a depressive episode (Field et al., 2009; Monroe et al., 1999b; Najib et al., 2004). A previous study reported that over 40% of those who experienced a breakup experienced clinical depression, with 12% experiencing moderate to severe depression (Field et al., 2009). Furthermore, post-breakup distress is also one of the risk factors for suicidal tendencies (Donald et al., 2006). Therefore, psychological resilience plays an extremely important role in protecting individuals from emotional and behavioral difficulties (Davydov et al., 2010; Dray et al., 2017). Many sources indicate that good psychological resilience can counteract the effects of stress-induced sleep deprivation (Li et al., 2016; Liu et al., 2016; Palagini et al., 2018; Wang et al., 2020), weaken the relationship between stress and rumination (Du et al., 2020), and reduce symptoms of depression (Southwick & Charney, 2012). However, in Vietnam, studies on post-breakup distress in students are still limited, with most literature focusing on divorce events in married couples (Quan et al, 2021). Similarly, research on resilience among Vietnamese students remained insufficient, with most research groups focusing on immigrant and refugee populations living abroad (Nguyen et al., 2015; Xin et al., 2013; Xu, 2017). In this context, conducting research on the correlation between psychological resilience and the level of distress, rumination, and sleep disturbances among post-breakup university students is essential to develop coping strategies tailored to each individual and student group. Furthermore, this research can aid in the development of programs aimed at enhancing psychological resilience in students in the future.

The aim of the study:
The aim of this study is to investigate the psychological resilience's impact on the level of distress, rumination, and sleep disturbances among university students after a breakup.

Research hypothesis:

> ***Hypothesis 1*:** Resilience is negatively correlated with the level of suffering after a breakup among university students.
> ***Hypothesis 2*:** Resilience is negatively correlated with rumination after a breakup among university students.
> ***Hypothesis 3:*** Resilience is negatively correlated with sleep disturbances after a breakup among university students.

The role of resilience in post-breakup distress, rumination and sleep disturbances

The role of resilience in post-breakup distress
Connor and Davidson (2003) defined psychological resilience as a personal quality that enables individuals to develop in the face of adversity. This dynamic process involves successful adaptation and maintenance of well-being after experiencing stress and adversity (Seery et al., 2010). Additionally, according to the American Psychological Association (APA, 2022), resilience is the process and the outcome of successfully adapting to difficult or challenging life experiences through flexibility in mental, emotional, and behavioral responses, regulating external and internal needs.

Furthermore, Liu et al (2017) proposed that psychological resilience was not only a result of overcoming difficulties or adversities but also provided protective factors such as the ability to maintain close relationships, regulate emotions, self-efficacy, self-control, motivation, and problem-solving skills to counteract risks and potential threats. Within the university setting, resilience is considered an asset that supports meeting the mental

health needs of students (Hartley, 2012) while also functioning as a protective factor that helps to minimize mental health problems and successfully adjust in the university context (Khawaja & Stallman, 2011).

Beasley et al (2003) found a negative correlation between psychological resilience and levels of distress in some samples of college students. Specifically, Simons & Gaher's (2005) study attested that students with low distress tolerance had difficulty regulating emotions and coping with stressful situations. Disputatively, Arslan revealed that resilient adolescents are less likely to experience psychological problems and can adapt to stressful events (Arslan, 2016). Endorsing this view, Hartley (2011) identified a relationship between psychological resilience and mental health in college students. Correspondingly, Haddadi & Besharat (2010) confirmed a positive correlation between mental health and psychological resilience, while also showing a negative correlation between psychological resilience and levels of distress in students. In other words, high psychological resilience allows students to minimize or avoid negative effects from stressful events, thereby enhancing their ability to cope and adjust to life better (DeRosier et al., 2013; Jing Wang, 2009; Law, 2010; Peng et al., 2012).

In summary, resilience serves as a coping mechanism for stress to enhance students' ability to adapt to difficulties. Conversely, students with poor resilience have to face the fallouts of stressful events, experiencing negative emotions that can affect their mental health.

The role of resilience in rumination
The inverse correlation between psychological resilience and rumination has been the focus of many researchers. Du et al (2020) found that high psychological resilience weakens the relationship between stress and rumination. This indicates that students with high resilience exceeding in coping with stressful events, therefore they can employ strategies to avoid or minimize negative emotional experiences (e.g., worry, anger, frustration) (Du et al., 2020). Contrarily, students with low resilience tend to use maladaptive emotion regulation strategies such as self-blame and ruminating about the painful event (Cheng et al., 2020). Similarly, Willis and Burnett (2016) also found that students have a higher inclination to engage in more repetitive thinking when under stress if they do not have good psychological resilience.

Harvey (2003) has proven that individuals who utilize ruminating as a coping mechanism when under stress have a propensity to negatively alter their difficulties, elicit depressive emotions, and engage in withdrawal and avoidance activities. This exacerbates the stress levels and affects sleep quality or causes insomnia in individuals (Harvey, 2002). Specifically, high psychological resilience significantly reduces rumination and improves sleep quality in students. In addition, Hou & Ng (2014) found that students with good psychological resilience tend to ruminate less or focus on positive thoughts in their stressful experiences. These positive thoughts help reduce distress and improve mental health after a traumatic experience (Cann et al., 2010).

Concisely, resilience and rumination have an inverse correlation. Particularly, individuals with high resilience tend to ruminate less than those with low resilience when faced with stressful events. Therefore, resilience is expected to be an important protective factor that helps individuals regulate negative emotions, cope with stressful experiences, and maintain mental health (Bonanno et al., 2012; Bonanno & Diminich, 2013; Bonanno & Mancini, 2012).

The role of resilience in sleep quality
High psychological resilience has been found to be related to better sleep quality and shorter sleep onset time (Gargiulo et al., 2021), which is consistent with previous studies (Palagini et al., 2018; Seelig et al., 2016). Individuals with high psychological resilience exhibit more flexible cognition to minimize risks (Ali et al., 2010), reduce symptoms of sleep disorders, and cope better with sleep deprivation or adversities (Matzner et al., 2013). On the other hand, low resilience is associated with difficulties in coping with stress and chronic psychological problems, including sleep disorders (Hjemdal et al., 2011; Wu et al., 2013). In summary, psychological resilience is directly related to sleep quality, and individuals with high psychological resilience are less likely to experience sleep-related problems and have overall better sleep.

Conversely, studies have shown that sleep disturbances may lead to reduced psychological resilience in college students (Kohler et al., 2013). Specifically, a cross-sectional study with 681 Spanish university students found that both male and female students with poor sleep quality, as measured by the Pittsburgh Sleep Quality Index (PSQI), reported significantly lower psychological resilience (Notario-Pacheco et al., 2011). In addition, a study by Arbinaga (2018) investigating the relationship between sleep quality and psychological resilience in 116 college students found that students reporting poorer sleep quality had lower psychological resilience scores than those with good sleep quality. Moreover, uneven sleep schedules, frequent sleep disturbances, and insufficient sleep time in children and students have also been reported to be associated with decreased psychological resilience (Doi et al., 2018; Wang et al., 2020). Furthermore, evidence based on neurobiological factors has emerged regarding the relationship between sleep disturbances and psychological resilience. For example, McCrory et al (2010) found that sleep disturbances inhibit the activity of the prefrontal cortex, a brain region critical for the development of psychological resilience. Recent studies have also reported similar results, indicating a direct effect of sleep disturbances on an individual's psychological resilience (Cheng et al., 2021; Germain & Dretsch, 2016).

METHOD

Participant and Procedure

We selected participants who were students from universities in Ho Chi Minh City, aged 18-25, had experienced at least one serious romantic relationship breakup, and had not been diagnosed with any psychological issues. In addition, we excluded participants who had entered into new relationships.

A total of 169 students (164 participants completed quantitative survey and 5 participants completed qualitative interview) were selected for the study and their characteristics are described in the following table 1.

Our study was designed as an embedded sequential mixed methods approach using a convenient sampling method. The research mainly concentrated on the quantitative (cross-sectional, correlational quantitative) study to explore the "*Correlation between resilience and the level of distress, rumination, and sleep disturbances of post-breakup university students*". Additionally, qualitative data is combined to provide more detailed information on the aforementioned relationship. The content of the survey consists of 5 parts: (1) Demographic information, (2) survey on the level of distress after breakup using the Breakup Distress Scale - BDS (Field et al., 2009), (3) survey on rumination using the Ruminative Response Scale - RRS (Treynor et al., 2003), (4) survey on sleep quality using the Pittsburgh Sleep Quality Index - PSQI, and (5) survey on psychological resilience using the CD-RISC-10 (Connor & Davidson, 2003). A total of 164 valid quantitative survey forms were collected.

We conducted the survey in two forms, including online and paper-based surveys. The online survey was designed using Google Forms and shared with university students through social media. In addition, the paper-based survey was designed on the Word platform and sent directly to student participants, and we collected them back after they finished. The collected data was processed and stored on a computer using Epidata and Excel software respectively. The data was then processed using SPSS ver 25.0 (IBM Corp, 2017) and PROCESS ver 4.1 (Hayes, 2017) software. The time to complete the survey questions ranged from 15 to 20 minutes. Data collection took place from November 14, 2022, to December 4, 2022.

After completing the quantitative data collection, we proceeded to gather qualitative data by sending interview invitations to university students in the Ho Chi Minh City area who fit the research criteria outlined in the "research participants" section. The research team then contacted the participants to confirm their eligibility and schedule an online interview. Five students agreed to participate and completed the interview session, which lasted between 30 to 90 minutes. The research process was approved by the health center and the Institutional Review Board of the university.

Characteristic	Sample	
	n	%
Gender		
Male	45	26
Female	118	70
Other	06	04
Age		
1997	07	04
1998	03	02
1999	13	08
2000	24	15
2001	54	32
2002	34	20
2003	27	15
2004	02	01
Other	05	03

Table 1 Characteristic of participants

Scale adaptation

Our research team chose to use the Breakup Distress Scale - BDS (Field et al., 2009), Ruminative Response Scale - RRS (Treynor et al., 2003), Pittsburgh Sleep Quality Index - PSQI, and CD-RISC-10 (Connor & Davidson, 2003) all of which have received approval for use from their original authors. The PSQI and CD-RISC-10 scales have been standardized in Vietnam. However, the BDS and RRS scales have not yet been used and standardized in Vietnam. Therefore, our research team conducted an adaptation process for these scales, which involved the following steps:

Step 1: The BDS and RRS scales were translated from English (original version) to Vietnamese by a member of our research team.

Step 2: Back-translation from the completed Vietnamese version in Step 1 to English was performed by a Bachelor of English Language.

Step 3: The back-translated scales in English (Step 2) and the original English scales were reviewed and evaluated by two psychologists, Dr. Nguyen Thi Loan and Ms. Nguyen Hong An, to ensure cultural and contextual appropriateness in Vietnam.

Measures
Quantitative scales:
Breakup Distress Scale - BDS

The Breakup Distress Scale (BDS; Field et al., 2009) was developed based on the Inventory of Complicated Grief (ICG; Prigerson et al., 1995) to measure the level of post-breakup distress. Loss is measured through 16 items instead of the 19 items in the ICG scale by Prigerson et al in 1995. The BDS is scored on a 4-point Likert scale ranging from 1 (Not at all) to 4 (Very much). The higher the total score of the 16 items, the greater the level of post-breakup distress, and vice versa. The Cronbach's alpha coefficient of the BDS questionnaire shows high internal reliability ($\alpha = 0.91$) (Field et al., 2010).

Ruminative Response Scale - RRS

The Ruminative Response Scale (RRS Short version) is a measure of the level of rumination developed by Treynor et al (2003), which consists of 10 questions from the original 22-item scale developed by Nolen-Hoeksema and Morrow in 1991. The original version of the 22-item scale showed good reliability ($\alpha = 0.74$-0.92, test-retest = 0.48-0.76) and validity in the United States (Cowdrey & Park, 2011; Whisman et al., 2018), Japan (Hasegawa et al., 2013), South Korea (Lee & Kim, 2014), the Netherlands (Griffith & Raes, 2015), Brazil (Lucena-Santos et al., 2018), France (Parola et al., 2017), and Spain (Extremera & Fernández-Berrocal, 2006).

The shortened version removes 12 questions related to depression (Nolen-Hoeksema et al., 1994; Treynor et al., 2003) but still maintains a high correlation with the original scale ($r = 0.90$, $\alpha = 0.85$) (Erdur-Baker & Bugay, 2010). The RRS Short version is a self-assessment scale in Likert format ranging from 1 (almost never) to 4 (almost always) and has shown high internal consistency among Chinese university students ($\alpha = 0.82$) (He et al., 2021).

The Pittsburgh Sleep Quality Index (PSQI)

The Pittsburgh Sleep Quality Index (PSQI) is a sensitive and widely used measure developed in 1989 to assess overall sleep quality and sleep disorders over a 1-month period (Backhaus et al., 2002; Buysse et al., 1989; Mollayeva et al., 2016; Sohn et al., 2011; Tsai et al., 2005). It is a 19-item self-report questionnaire consisting of 7 components of sleep: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medications, and daytime dysfunction. PSQI combines open-ended and 4-point Likert scale responses ranging from 0 (not during the past month) to 3 (3 or more times a week). The total score ranges from 0-21, with a score greater than 5 indicating sleep disturbances (To & Nguyen, 2015). The Cronbach's alpha coefficient of the Vietnamese version standardized by Ms. To Minh Ngoc et al in 2015 implied a good result ($\alpha = 0.789$).

Similar to the Vietnamese version, the reliability of PSQI has been demonstrated in other countries such as Italy ($\alpha = 0.825$; Curcio et al., 2012), Japan ($\alpha = 0.77$; Doi et al., 2000), South Korea ($\alpha = 0.84$; Sohn et al., 2011), and China ($\alpha = 0.835$; Tsai et al., 2005).

Connor-Davidson Resilience Scale 10-Item (CD-RISC-10)

The Connor-Davidson Resilience Scale 10-Item (CD-RISC-10) is a shortened version of the original 25-item scale developed by Connor and Davidson in 2003, created by Campbell-Sills and Stein in 2007. Like the original version, CD-RISC 10 is a self-report scale measuring an individual's resilience using a Likert 5-point scale, ranging from 0 (not true at all) to 4 (nearly true all the time). The total score of CD-RISC 10 ranges from 0-40, with higher scores indicating greater resilience. In previous research using the translated Vietnamese version, Cronbach's alpha value was found to be good ($\alpha = 0.84$) (Minh-Uyen & Im, 2020).

Qualitative interviews:

Qualitative data was collected through a semi-structured interview method with a focus on the theme of "post-breakup" experiences among university students, in order to gather realístic, detailed, and authentic experiences from participants. Participants were encouraged to describe their personal experiences when facing a breakup in a romantic relationship, how they handled the issues that arose afterwards, and the supportive factors that helped them overcome the challenges (if any).

Data Analysis

Quantitative Analysis

Our research team used SPSS software (IBM Corp, 2017) to analyze the correlations between variables. Specifically, Pearson and Spearman correlations were used to examine the relationship between resilience and levels of post-breakup distress, rumination, and sleep quality in university students.

Qualitative Analysis

Our group chose to use the directed content analysis method proposed by Hsieh & Shannon (2005) to analyze qualitative data. First, themes were developed based on previous quantitative results, including the relationship between resilience and three factors: post-breakup distress, rumination, and sleep disturbances. Next, our team read and evaluated the data obtained from the interviews to identify characteristics related to the initial themes. Then, the data was sorted and classified into appropriate theme groups. Before the classification stage, the entire data was read and contemplated multiple times by the research team to gain a comprehensive understanding of the data provided by the participants. For data that did not relate to the themes, the research team reassessed and reanalyzed the data to determine whether it represented a new theme or belonged to a subset of the original themes. Finally, the group reported the analysis process and results to demonstrate the relationship between the qualitative data obtained and the initial confirmed themes. In addition, to ensure reliability, all members of the research team participated independently in the process of data analysis and synthesis. All interview sessions were recorded accurately and completely during the research process.

RESULTS

Cronbach's alpha

In the current study, the Cronbach's alpha coefficient of all measurements indicate high reliability level (*α > 0.7*) (Nunnally & Bernstein, 1994), as described in Table 2. Specifically, with BDS acquired 0.920, RRS achieved 0.860, PSQI scale achieved a score of 0.807, and finally, the CD-RISC-10 achieved 0.914.

	n	*M*	*SD*	*Max*	*Min*	*α*
1. BDS	16	29.74	10.66	64	16	.920
2. RRS	10	21.68	6.74	40	10	.860
3. PSQI	14	6.89	3.31	16	01	.807
4. CD-RISC-10	10	25.13	8.03	40	0	.914

Table 2 Cronbach's alpha

The correlation between Breakup distress, Rumination, Sleep disturbances, and Resilience

Variable	*n*	*M*	*SD*	1	2	3	4
1. Breakup Distress	164	29.73	10.66	—			
2. Rumination	164	21.68	6.74	.730**	—		
3. Sleep Disturbances	164	25.13	8.02	.289**	.377**	—	
4. Resilience	164	6.89	3.31	-.155*	-.185*	-.163*	—

Table 3 The correlation between Breakup distress, Rumination, Sleep difficulties, and Resilience.

Note. *$p < .05$, **$p < .01$

Resilience and post-breakup distress in university students

Resilience has a negative correlation with post-breakup distress (*r = -.155, p < .05*) (see Table 3). This demonstrated that individuals with better psychological resilience experienced lower levels of distress after a breakup. This result is consistent with previous studies, suggesting that better psychological resilience is associated with lower levels of psychological distress in university students (Stallman, 2011). Specifically, Arslan's (2016) study found that adolescents with better resilience are less likely to experience psychological problems, are better able to adapt to stressful situations, think more positively (Mak et al., 2011), and use less ineffective coping strategies (Wilks et al., 2011). One participant in the study described the issue as follows: "*I am very optimistic, and I feel normal. Without love, I have friends and family, and I don't emphasize the importance of love too much. That person was just a mark in my life, and I don't attach too much to it. Love comes to add more colors to life.*" Another participant commented that "*Breaking up is a necessary thing for one's growth... it brings many lessons and experiences, changes one's worldview, and I'm not a child in my safe zone anymore. To this day, breaking up is something sacred and meaningful to me. I no longer see it as a negative thing.*"

In addition, Leung et al (2011) have referred that maladaptive coping strategies are positively associated with the level of distress, and rumination can lead to emotional problems (Sbarra & Ferrer, 2006). Another participant with a different experience stated, "*When he told me it was over, I felt hurt, uncomfortable, and sad.*

Then I only ate and slept. I wanted to forget everything, so I wouldn't have to remember or think anymore. I feel terrible about myself. Why didn't I find something that makes me happier instead of falling into sadness?"

Furthermore, some researchers have emphasized that individuals with high levels of psychological resilience are less likely to fall into depression after a romantic relationship ends (Yau, 2013). To put it concisely, maladaptive coping strategies are a risk factor for emotional problems after a breakup (distress being one of them), and individuals with better psychological resilience are less likely to practice such strategies. Therefore, students with better resilience feel less distress after a breakup.

In addition, contributing to the relationship between psychological resilience and post-breakup distress, Chung et al (2003) studies purported that seeking social support is one of the most commonly used coping strategies after a romantic relationship ends. Social support is thought to have a positive relationship with psychological resilience and adjustment after a breakup while reducing depression, reducing distress (Sinokki et al., 2009), and increasing the ability to cope with negative outcomes (Schwarzer & Knoll, 2007). Social support refers to the care and assistance that individuals perceive from others (Raschke, 1978). Contingent on the relationship perspective among individuals, social support is divided into four types: emotional support, which involves providing others with empathy, warmth, love, and trust; instrumental support, which involves providing material and service support when others need it; informational support, which involves helping others solve problems by providing useful suggestions, information, etc.; and appraisal support, which involves providing useful information for others to self-evaluate (House et al., 1988; Taylor et al., 2007). From there, it helps individuals face and recover from difficult and challenging events in life, as well as improve positive mental states (Cao et al., 2020). Some studies have shown the positive effects of social support on psychological resilience (Wilks & Croom, 2008; Wilks & Spivey, 2010), and conversely, psychological resilience also has a positive impact on seeking social support as part of the process of coping with difficulties (DeLongis & Holtzman, 2005). Explicitly, social support from family, friends, and those around them significantly moderated the relationship between psychological resilience and subjective well-being in university students (Khan & Husain, 2010). The study by Haglund et al (2009) also suggests that students with good social functioning and support from their relationships will become more resilient.

In consideration with diverse social support sources, it has been found that among university students in particular, support from friends and family is significantly related to psychological resilience compared to "significant others" (Narayanan & Alexius Weng Onn, 2016). Opinions on this issue include *"my family is always behind me in every aspect of my life, so I feel very fulfilled. I have no problems, nothing to complain about," "no matter what, I still have family and friends to support me mentally. If this door closes, another one will open. That's what I think,"* and *"when I go back to my hometown, I get to be with my family... that closeness helps me a lot in the recovery process."*

This is consistent with previous research by Masten & Reed (2002) that bonding relationships with family and friends are reported to be strongly correlated with psychological resilience. Specifically, perceived social support from friends is a predictor of strong recovery compared to support from family (Narayanan & Alexius Weng Onn, 2016). Some interviewees expressed that *"a large part of it is thanks to their friends, the people around them, who have brought them positive emotions and helped them to recover automatically", "the main thing I mention is definitely my friends, I started by sharing with my friends."*

In agreement with these results, Lamis et al (2016), Burns et al (2020) further suggest that peer support, which is the connection established among individuals of the same age in shared activities and cooperation, is an essential social support for university students (Burns et al., 2020; Lamis et al., 2016). In summary, social support is a means to enhance psychological resilience so that individuals can experience positive emotions (Karadag et al., 2019). This means that the higher the level of social support a person receives, the higher their psychological resilience (Arafat HSB et al., 2022). With consistency from research findings, intervention measures designed to support individuals after a breakup should encourage social participation and social relationships around each person to support and enhance psychological resilience and reduce the feeling of distress after a romantic relationship ends.

Resilience and post-breakup rumination.

Psychological resilience has a negative correlation with rumination ($r = -.185, p < .05$) (see Table 3). As predicted, our study found an inverse correlation between psychological resilience and post-breakup rumination in university students. Particularly, students with better psychological resilience experience less rumination after a breakup. This is also reflected by interviewees as follows: *"The more days pass, the more positively I think, like at first, 1-2 months after breaking up, I still somewhat blame that person. Don't understand that person. Keep asking why? Why is it like this, why is it like that? Later I realized that there is no why, it is what it is. I no longer try to find answers. I know it's like that, I accept it and move on."*

Corroborate with this finding is Willis & Burnett's (2016) study, their results validated the view that poor psychological resilience is associated with higher levels of rumination. Conversely, individuals who engage in many ruminative actions after stressful events are less likely to exhibit good psychological resilience (Troy & Mauss, 2011). One participant shared a different experience, stating that thoughts related to the breakup *"occupy*

half of the day. Every time I think about it, I try to sleep more to avoid thinking. I want to avoid it... occasionally I have negative thoughts about those issues."

Moreover, positive psychological characteristics such as self-esteem, grit, and optimism are all related to the ability to regulate post-breakup adjustment (O'Sullivan et al., 2019). On the other hand, poor coping ability after the loss of a relationship is associated with depressive symptoms and rumination in young adults. Specifically, low optimism and self-esteem are related to higher levels of rumination, while high courage is related to less rumination, regardless of the length of time since the breakup (O'Sullivan et al., 2019).

Furthermore, Neenan & Dryden (2011) as well as Deen et al (2017) have suggested that rational beliefs (RBs) facilitate the development of resilience and psychological strength in individuals (Neenan & Dryden 2011, Deen et al., 2017). Rational beliefs are expressed as follows: *"If I face a challenge that is too great in life, I may be overwhelmed, but eventually I have to stand up slowly. No matter what, I've to try to stand up and not give up. I will not obsess over things, I will stand up and take action. Then everything will be okay. I will avoid what I can, but if I can't, I will face it directly. In general, I am very optimistic, I am not too pessimistic about everything or exaggerate things."*

In contrast, high levels of irrational beliefs are associated with passive brooding and higher levels of post-breakup distress (Szasz, 2011). The concepts of rational and irrational beliefs are central to the division between healthy and unhealthy in the rational-emotive behavior theory (REBT). Irrational beliefs are rigid and dogmatic, whereas RBs are flexible and prioritize healthy and effective responses to life's challenges (Dryden, 2014). RBs contribute to the creation of positive coping strategies and enhance psychological resilience when faced with stressful life events. Specifically, RBs provide clear guidance in the search for psychological strength, inspire and motivate individuals on their journey towards high levels of recovery (Dryden, 2007). This opinion is further supported by another participant who stated, *"The hardest challenges I've faced it already, I've already overcome. There is nothing that I cannot overcome in the future. I can take lessons from those experiences. They are already in my subconscious, so I feel that such difficulties help me have more inner strength. I am more determined, more steadfast, and not easily shaken."*

Dryden (2020) emphasizes the importance of rationality in cognition, emotion, and behavior in order to avoid further fear for individuals when facing adversity. Creating meaning is seen as a resource for coping with difficult life circumstances such as adversity, crisis, and trauma (Janoff-Bulman & Yopyk, 2004; Damon, 2009; Linley & Joseph, 2011; Melton & Schulenberg, 2008; Park, 2013; Czekierda et al., 2017).

In addition, irrational beliefs are related to rumination behavior due to their negative nature and self-criticism of irrational beliefs (Rude et al., 2007; Trew & Alden, 2009). Szasz's (2011) study found a positive correlation between irrational beliefs and reflective pondering as well as irrational beliefs and brooding. It is conspicuous that the relationship between irrational beliefs and brooding is stronger, with brooding playing an intermediate role in predicting the significant relationship between irrational beliefs and distress, while reflective pondering does not. To clarify this, Treynor et al (2003) proposed that rumination can be conceptualized into two components: brooding and reflection. Brooding is the more maladaptive component of rumination as it predicts depressive symptoms one year later, whereas reflection predicts current depression but also predicts decreasing levels of depression over time (Treynor, 2003). Segerstrom et al (2003) also suggested a similar view, where brooding is conceptualized to represent the negative aspect of thinking content, while reflective pondering represents searching for meaning and includes withdrawal. It can be said that among many factors affecting the development of psychological resilience, the most important factor is each individual's belief in the face of difficulties and challenges they have to face (Dryden, 2011).

Overall, psychological resilience is an important factor in protecting individuals from negative emotions, coping with melancholy events, and maintaining mental health (Bonanno et al., 2012; Bonanno & Diminich, 2013; Bonanno & Mancini, 2012), improving symptoms of depression and rumination within each individual (O'Sullivan et al., 2019). Additionally, rational beliefs are the "protective factor" (David, Freeman, & DiGiuseppe, 2010) in difficult situations, and are also related to psychological resilience (e.g. Sarkar & Fletcher, 2014). Therefore, "education programs on assessing challenges and synthesizing reflection strategies, such as evaluating personal assumptions, minimizing catastrophic thinking, challenging counterproductive beliefs, and restructuring cognition, should be a central part of resilience training" (Fletcher & Sarkar, 2012).

Resilience and sleep disturbances

Through data analysis, our research found a negative correlation between psychological resilience and sleep disturbances following a breakup in university students ($r = -.163$, $p < .05$) (see Table 3). In other words, students with higher psychological resilience will generally have better overall sleep and undergo fewer sleep problems. Participants with good psychological resilience evaluated their sleep after a breakup as follows: *"There weren't too many changes in my daily habits. I sleep enough, not too much or too little. If I stay up late, I go to bed around 11-12 and wake up at 7 in the morning. If I sleep earlier, I wake up around 5-6,", "I naturally fall asleep, and when my body is tired, I can fall asleep immediately. I don't have negative thoughts anymore. When I'm not too tired, I can fall asleep within 15 minutes without negative thoughts."*

McCuistion (2016) also established similar results, with a significant negative correlation between psychological resilience and the severity of sleep problems. Thus, as resilience increases, the amount of sleep difficulties decrease. Owing to the fact that, psychological resilience reduces the changes in neurohormones caused by sleep deprivation, thereby improving the mental and physical state of each individual (Sun et al., 2014).

Correspondingly, in the relationship between psychological resilience, stress, and sleep, stress is the primary factor closely related to disrupted sleep (Morin et al., 2003). Some cross-sectional studies have indicated that individuals who have a history of exposure to stressful events in life will negatively affect sleep quality in both subjective reports and objective measures (Van den Bergh et al., 2005). The disturbances with sleep are expressed as follows: *"Not sleeping straight through, sometimes waking up and then going back to sleep, sometimes sleeping straight through but feeling like I haven't slept at all and feeling very tired the next morning."* The process of falling asleep is *"long, and before falling asleep, I toss and turn and have a hard time falling asleep even though I try to close my eyes for a long time."*

In this case, high psychological resilience is a factor that helps individuals reduce distress and thence promote better mental health (Lai et al., 2020). Due to the fact that, when stress occurs, the Hypothalamic-Pituitary-Adrenal (HPA) axis is activated, leading to the release of cortisol in response to stress, and high psychological resilience can help individuals cope with distress.

Disruption of the HPA axis function (when HPA is activated, the activation of HPA can cause an individual's sleep to become worse) contributes to the poor sleep of an individual (Minkel et al., 2014). It is worth noting that when sleep is disturbed, it can increase their anxiety about sleeping the next night, creating a vicious cycle of difficulty sleeping due to stress, leading to the body becoming anxious about the ability to sleep the next night, which in turn makes it difficult for the body to sleep due to anxiety (Minkel et al., 2014). In this situation, resilience plays a role in limiting the increase in CRH and cortisol caused by stress through a complex negative feedback system related to optimal function and balance of glucocorticoid and mineralocorticoid receptors (Charney, 2004; de Kloet et al., 2005; Lu et al., 2008). Furthermore, individuals with good psychological resilience will use active and minimizing coping styles, which helps to reduce negative impacts or symptoms of depression, lower anxiety levels, and improve sleep quality (Lai et al., 2020). In conclusion, resilience plays a protective role for individuals from negative consequences of stressful events leading to sleep disturbances and promotes appropriate coping strategies to improve sleep.

CONTRIBUTIONS AND LIMITATIONS

Contributions
In this study, our research group found a correlation between psychological resilience and levels of distress, rumination, and sleep disturbances in university students following a breakup. This means that individuals with higher psychological resilience experience less distress, rumination, and fewer sleep problems. Consequently, it protects individuals from psychological problems, fosters positive thinking, and maintains mental health (Arslan, 2016; Mak, Ng, & Wong, 2011; Bonanno & Mancini, 2012). These findings highlight the important role of psychological resilience in coping with stressful events. Hence, the group suggests that future studies may develop interventions and programs to enhance psychological resilience in students (as detailed in the recommendations section). The findings of this study can provide additional reference information on the topic of post-breakup experiences in Vietnamese students, particularly in the context where research on this topic is still limited and has not received sufficient attention from researchers.

Limitations
In addition to the aforementioned contributions, the research team also identified the following limitation. Due to the scope and research direction of the study, which aimed to investigate the correlation between psychological resilience and post-breakup distress, rumination, and sleep disturbances, the team only considered rumination as a potential mediator in the relationship between stress and sleep problems. However, during the literature review and analysis process, our team noticed that rumination could also act as a mediator in the relationship between stress and sleep difficulties (Amaral et al., 2018; Lamis et al., 2018). In this instance, psychological resilience not only is a correlational variable but is also a moderating variable that can reveal the deeper impact of psychological resilience on the relationship between post-breakup distress, rumination, and sleep disturbances. Thereupon, our team will provide further recommendations on this issue in the next section.

RECOMMENDATIONS

Recommendations for practical application
Our research coherent the role of resilience toward the level of distress, rumination behavior, and general sleep issues post-breakup in university students. Therefore, intervening in psychological resilience is fundamental in order to improve sleep quality, and reduce levels of rumination on stressors. This will support students in acquiring

necessary knowledge, appropriate responses to form suitable coping strategies for further life's challenges. Based on our findings, we found that both Mindfulness and Rational Emotive Behavior Therapy (REBT) have demonstrated significant effectiveness in enhancing psychological resilience (Callahan et al., 2018a; Chan et al., 2006).

Firstly, according to William et al in 2007, mindfulness is awareness, nurtured by purposeful and non-judgmental attention in the present moment (William et al., 2007). Results have shown that students who participated in mindfulness practices had lower levels of distress, maintained their mental health (Howell et al., 2008; Galante et al., 2018), and exhibited better psychological resilience when faced with stress (Galante et al., 2018). Similarly, Galante et al (2020) and Bamber & Schneider (2020) reported that practicing mindfulness among students helped increase psychological resilience, enhance awareness, and regulate emotions after stressful events (Bamber & Schneider, 2022; Galante et al., 2020). Specifically, a study by Davidson & Begley in 2012 concluded that mindfulness creates emotional balance, improves the ability to remain calm, and helps one react and approach problems in a rational and appropriate way, rather than automatically and irrationally. Davidson & Begley suggested that through the practice of mindfulness, individuals learn to accept whatever is happening in the present moment, thereby maintaining calmness in the face of stressful situations (Davidson & Begley, 2012). Additionally, by pausing and observing the mind, individuals can prevent themselves from getting engrossed in negative thoughts, promoting faster readjustment from difficult challenges (Davidson & Begley, 2012). Furthermore, practicing mindfulness can help individuals become more creative and flexible in establishing appropriate coping strategies when faced with stressors, without becoming overwhelmed or stuck (Langer & Moldoveanu, 2000; Wallace & Shapiro, 2006). Developing deep and long-term mindfulness practice can enhance psychological resilience to stress, thus reducing anxiety, limiting ruminative processes, and increasing the ability to focus on problem-solving strategies (Shapiro et al., 2007; Verplanken & Fisher, 2014).

However, adhering to and maintaining mindfulness practice is considered a challenge for participants (Shapiro et al., 2003). Specifically, mindfulness practitioners struggle with remembering exercises, worrying about "doing it right," lacking motivation, and being unwilling to practice informal exercises at home (Allen et al., 2009; Moore & Martin, 2015; Morgan et al., 2015; Segal et al., 2013). Similarly, studies by Hindman et al (2015) and Martinez et al (2015) suggest that participants have difficulty practicing exercises (such as falling asleep during meditation or body scan) and completing assigned exercises. To overcome the cited difficulties, the support from the mindfulness practice group and self-belief in the practice of mindfulness are considered prominent factors that influence the participation process (Birtwell et al., 2019). In other words, when participants receive support from instructors and others who practice mindfulness, they feel that they are part of a "mindfulness community". This increases their ability to adhere to and maintain regular practice of exercises (Birtwell et al., 2019). In addition, belief in mindfulness is an equally important factor for those new to mindfulness practice (Birtwell et al., 2019). Confidence in trust and acceptance helps them to view mindfulness practice in a more positive way (Kabat-Zinn, 2005). For example, after an unsuccessful mindfulness practice, instead of worrying about performing exercises inaccurately and withdrawing from practice, they will see every moment of practice as valuable and know that they can start again at any time. In summary, mindfulness-based interventions (such as breathing exercises, meditation, body scan, etc.) can help individuals adapt more effectively to stress (Grossman et al., 2004; Shapiro et al., 2005), enhance long-term positive emotional experiences, increase psychological resilience and the ability to build effective coping strategies (Davidson & Begley, 2012; Galante et al., 2020). As a result, it can support the promotion of mental health (Ryan & Deci, 2001) and improve sleep quality for each individual in the face of life challenges.

The next intervention we want to mention is REBT developed by Albert Ellis in the 1950s, which centers around the idea that a person's beliefs when facing adversity are influential in the development of psychological resilience (Dryden, 2011). Consequently, REBT will help individuals identify irrational beliefs and negative thinking that lead to inappropriate emotions and behaviors when facing adversities. Thereupon, it supports individuals to develop coping strategies to replace these thoughts with more rational and flexible ones (Ellis & Joffe Ellis, 2019; Turner, 2016). Results show that REBT is effective in reducing irrational beliefs, decreasing anxiety, and promoting psychological resilience development (Deen et al., 2017; Noormohamadi et al., 2022). Zadeh et al (2017) also have a similar view that REBT improves mental health and psychological resilience in adolescent girls. Individuals trained in stress management skills and effective problem-solving strategies have lower levels of anxiety and better psychological resilience (Froutan et al., 2018). REBT helps individuals reduce irrational beliefs and promote flexible rational beliefs - an important factor in enhancing psychological resilience (Dryden, 2011). Therefore, REBT is considered an intervention method that can facilitate the development of psychological resilience.

Nonetheless, REBT also has limitations. Firstly, it requires a positive, decisive, and continuously challenging therapist who debates irrational beliefs with the client. However, not all therapists are suitable for these requirements (Rosner, 2011). Secondly, REBT is seen as a confrontational intervention for some individuals. Corey (2011) believes that the confrontational approach of REBT and the therapist's decisive style can make clients feel scared, especially before they establish a solid therapeutic relationship with the therapist through respect and trust

(Rosner, 2011; Corey, 2011). Lastly, REBT requires active participation from the client in replacing beliefs and developing rational coping strategies for their problems. This may present a challenge for the client (Rosner, 2011).

In summary, REBT is a confrontational intervention for some individuals. However, overall, it is an intervention method that helps individuals reduce negative thoughts, challenge irrational beliefs, restructure and enhance cognition about behavior, thoughts, and emotions (Ruggiero et al., 2014). Hence, it is valuable in developing rational beliefs, constructing appropriate coping strategies, and is considered a method to enhance personal psychological resilience (Schinke & Jerome 2002; Deen et al., 2017).

Future research directions

During the course of evaluating the role of resilience in post-breakup distress among college students, we have found that resilience can exist as a moderating variable that affects the relationship between stressful life events and sleep disturbances through the mediating role of rumination (Li & et al., 2019). Distinct with correlation, moderating variables help support the external validity of the study by identifying limitations when establishing relationships (Bhandari, 2022). External validity is the ability to generalize the findings of a study to different situations, people, contexts, and measurement tools. The purpose of scientific research is to generate general knowledge about the real world, and without high external validity, the results from the laboratory cannot be applied to others or a large population. Therefore, recognizing the role of moderator variables helps to design studies more accurately and closer to existing realities. Our next recommendation for future research is to explore resilience as a moderator variable to provide additional knowledge to complete the overall picture of the topic.

CONCLUSIONS

Our research coherent the role of psychological resilience toward the level of distress, rumination behavior, and general sleep issues post-breakup in university students. Based on our findings, we recommend the application of techniques such as Mindfulness and REBT to intervene and improve coping abilities with stress, help students to minimize sleep difficulties (Noormohamadi et al., 2022; Galante et al., 2020), and transition negative thoughts into constructive and positive ones (Watkins et al., 2011). Objectively speaking, experiences of distress are opportunities for individuals to collide with different aspects of life and approach new perspectives (Maunder et al., 2008). The process of adapting to this challenge helps individuals increase their emotional and mental resilience (Chan et al., 2006). Once a change in perspective is achieved, the coping process can be shortened (Chan et al., 2006), and the process of learning from distress experiences can help individuals improve self-awareness or even enlightenment (Schaefer & Moos, 2001).

Works Citation

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