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Contents

Introduction to the special issue of Primenjena psihologija: Mindfulness

Going forward with mindfulness research across the world

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Although mindfulness has been a part of Buddhist traditions for over 25 centuries, only in the recent decades we have been witnessing the emergence of secular forms of mindfulness that do not have religious components. It all began in the United States in the late 1970s when Jon Kabat-Zinn developed the first secular mindfulness intervention called Mindfulness-based Stress Reduction (MBSR) and soon thereafter began testing its effectiveness with research methodology (Kabat-Zinn, 1982). Today we can find mindfulness not only in monasteries, but also in hospitals, prisons, schools, or companies around the world.

The transition from mindfulness embedded within Buddhism in Asia to mindfulness as an evidence-based intervention that is omnipresent happened, and continues to happen, primarily thanks to research. We can see from Figure 1. that it took about 25 years from the first Kabat-Zinn's studies for the research on mindfulness to start taking off. Then in the past 15 years, the interest in mindfulness research has exploded so much so that now we have thousands of studies published annually. Mindfulness studies can be found across disciplines, but 47% of studies are published in psychology journals (Baminiwatta & Solangaarachchi, 2021), which makes mindfulness one of the most popular topics in modern psychology research.

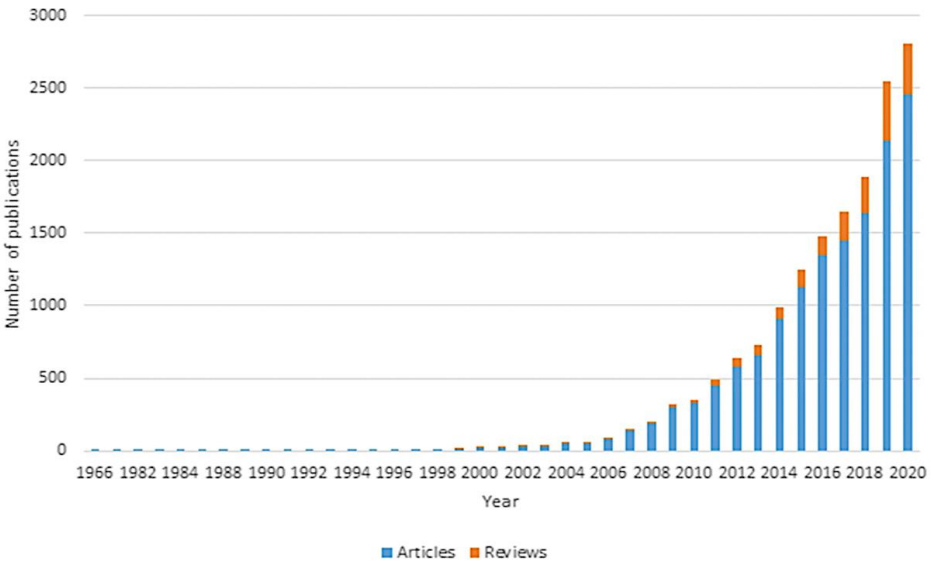

Figure 1. Number of publications on mindfulness indexed in Web of Science 1966–2020 (from Baminiwatta & Solangaarachchi, 2021).

All mindfulness studies can be divided into two main categories: research of mindfulness interventions and research of trait mindfulness. Research of mindfulness interventions usually aims to measure the effectiveness of learning and practising mindfulness on different health-related outcomes. The optimal research design for testing mindfulness intervention is a randomised controlled trial, ideally with an active control group and long-term follow-ups. From 2000.-2019., 1389 randomised controlled trials of mindfulness interventions were published, and 46% of them include an active control group (Ma et al., 2021). The problem is that randomised controlled trials are labour-intensive and expensive to conduct, so most of these studies originate from countries where there have been extensive funding opportunities for studies of mindfulness and for research in general, such as the United States or the United Kingdom. This problem is reflected in all types of mindfulness studies, which can be seen from the Figure 2. that shows the origin of all published mindfulness studies.

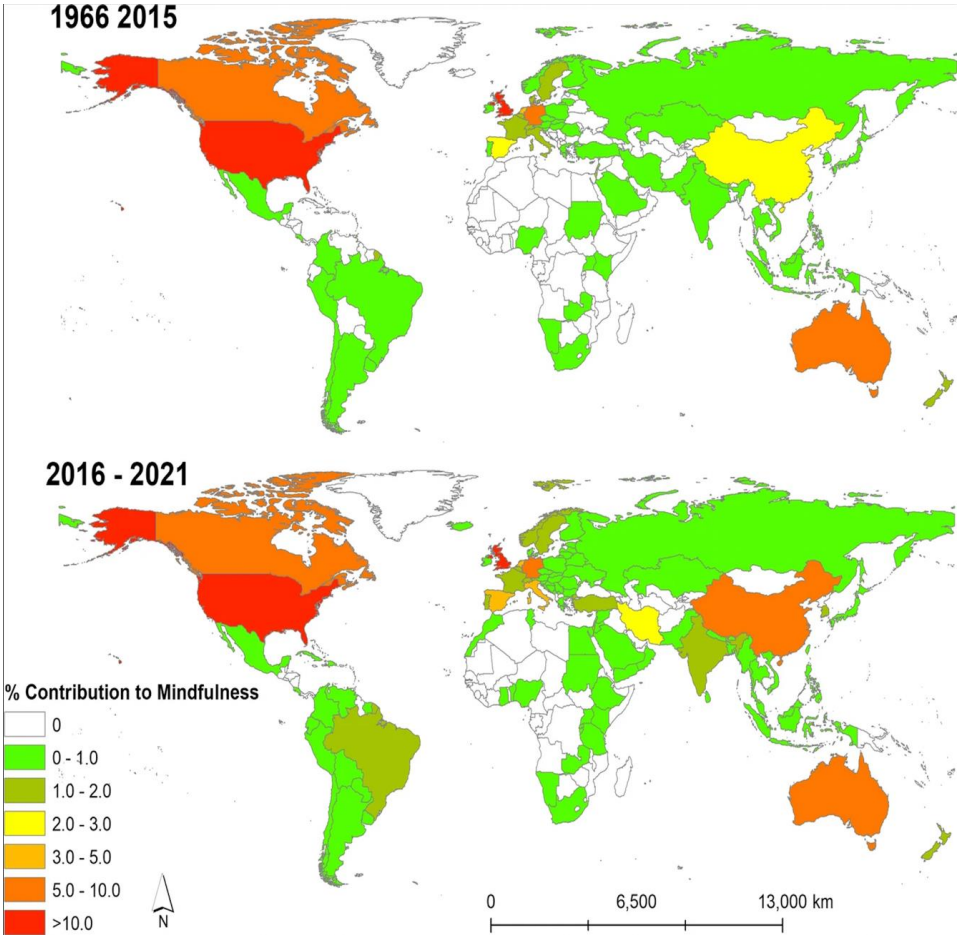

Figure 2. Contributions (%) by countries to mindfulness research in the early (1966–2015) and recent (2016–2021) periods.

Other than the United State and the United Kingdom, countries that published the most mindfulness studies are Australia and Canada. The landscape is slowly changing, but there are still many countries with small contributions, which is not only due to a lack of research funding. The other barrier is that countries with strong religious backgrounds perceive mindfulness as unacceptable due to its Buddhist roots, even when introduced in a fully secular form. This naturally comes together with a lack of qualified mindfulness teachers and experts in these

countries, which makes it even harder to conduct studies of mindfulness interventions.

This lack of funding and general support for mindfulness research in some countries cannot be easily overcome. It takes time, patience, and persistence to establish mindfulness as a relevant research topic in a new environment. The first step is to conduct studies of trait mindfulness (also known as dispositional mindfulness) that can be easily measured with validated questionnaires. Mindfulness is a trait that we all have to some degree even if we were never introduced to the theory or practice of mindfulness. This special issue introduces five papers from four countries with minimal previous research of mindfulness—Croatia, Serbia, Pakistan, and Indonesia. These studies not only lay the ground for further mindfulness research in these countries, but they also provide generalisable insights into the relationship of trait mindfulness with other psychological constructs. With this step, we are going forward with mindfulness research across the world.

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Research Article

Role of Mindfulness between Early Maladaptive Schemas and Post-Partum Depression: a Ray of Hope

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ABSTRACT

Mothers of a newborn face a lot of physical and psychological challenges and early maladaptive schemas play a significant part in determining long-term negative consequences such as post-partum depressive symptoms. This research proposed that mindfulness could play a positive role between the early schemas and post-partum depressive symptoms among new mothers. Data was collected from a sample of 170 mothers who gave birth from February 2020 to August 2020. The young schema questionnaire-SF, Edinburgh postnatal depression scale, and the Kentucky inventory for mindfulness scale were administered. Study findings show mindfulness mediates the association between five sub-domains of maladaptive schemas namely impaired autonomy, impaired limits, disconnection, over-vigilance, other-directedness, and post-partum depression. Findings indicate that mindfulness could be a contributing factor against postpartum symptoms and play significant role in mother and infant's well-being during the challenging time of transition.

Keywords: early maladaptive schemas, mindfulness, postpartum depression

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Introduction

Buddhism proposed the fundamental idea that life is primarily defined by imperfections. Consequently, our psychological capacity to remember positive things and fight negative experiences is futile. Giving birth is a potentially stressful and critical experience and event for mothers, entailing different changes at the interpersonal and individual levels. This can cause various types of distress running in force and span (e.g., Guzzo & Hayford, 2020). Both carrying a child and giving birth can be considered traumatic and potentially stressful experiences requiring mothers to deal with several adjustments in their habits, priorities, lifestyles, self-image, and personal identity (Molgora et al., 2018). Even though most women overcome numerous challenges in the time of pregnancy and postpartum, it has additionally been seen that a proportionate number of mothers think that it is hard to recuperate from post-partum depression (e.g., Nagy et al., 2011).

Early maladaptive schemas can be explained as broad, self-perpetuating, and maladaptive life events starting from hostile social encounters with important characters in both childhood and teenage years. It was also purported that the main reason behind the development of maladaptive cognitive schemas is repeated neglect of childs' universal core psychological needs (autonomy, spontaneity and play, secure attachment, realistic limits, freedom to express his needs and emotions). Maladaptive schemas are unavoidable and stable over the long run and significantly influence general information processing (Young et al., 2003). Once a schema gets activated, a person experiences disturbing negative emotions and feelings like shame, fear, and disgust. Some intrapsychic facets could be significantly activated during the process of becoming a mother, for instance, early relational experiences with significant figures in life. According to Merle-Fishman (2010), the intricate psychological process of being transformed into the role of a mother includes the re-organization of oneself. The outcome of this process and experience are influenced by the mother's early social encounters, portrayals, and re-lived memories.

Headed for the cognitive theory of depression, early schemas proposed precious addition to the idea of dysfunctional attitudes and automatic thoughts. It is known that maladaptive schemas like failure, defectiveness, and self-sacrifice were associated to the gravity of depressive symptoms in non-clinically depressed samples (Calvete & Cardeñoso, 2005). According to Colodro-Conde et al. (2018), childbirth is a stressful life event than can trigger the underlying diathesis, resulting in symptoms of depression. Moreover, the diathesis-stress model of depression purports that certain individuals are highly predisposed to depression in the context of adverse life events. The empirical outcomes proposed cognitive vulnerability as a particular diathesis for depression symptomatology (Kenny et al., 1993). Renner et al. (2012) suggested specific maladaptive schemas like emotional deprivation, instability, and failure were also related to the severity of depressive symptoms. Likewise, the disconnection domain has been related to depression prospectively and cross-sectionally (Van Vlierberghe et al., 2010).

Research results also indicate that the schema domain of impaired autonomy, disconnection, and other-directedness, is related to the level of social anxiety and depressive symptoms and the stability of depressive symptoms with time (Calvete et al., 2015). The schema of self-sacrifice and social isolation, mistrust and social isolation, and other-directedness facilitated the relation between depressive symptoms and estrangement from peers, trust in parents, and quality of attachment relationships, respectively (Roelofs et al., 2011). Depressive symptoms and impaired autonomy association had also been found in prior literature (Shih, 2006). The schema domain of other-directedness that focuses on others, such as approval, sociology, social evaluation concern, and neediness forecast depressive symptoms (Rudolph & Conley, 2005).

During the transition of motherhood, a woman's encounters with a significant change in life might be triggered accompanied by serious uneasiness, vulnerability, emotional fluctuation, and uncertainty related to parenthood. Considering postpartum depression, some studies validate a significant connection between insecure attachment style and depressive indicators (Ikeda et al., 2014). Though these findings provide empirical evidence that mothers' early

social experiences affect the adjustment level post-partum. Consequently, considering the predisposition of post-partum symptoms, this research intends to highlight a protective factor that is hypothesized to intervene between two negatively influencing variables called early maladaptive schemas and post-partum depressive symptoms. This protective factor is supposed to have the potential of becoming a ray of hope in a time of despair.

Mindfulness is characterized as a state of mind in which an individual focuses on experience in the current moment in a non-judgmental manner (Miller et al., 1995). The concept of mindfulness originated from Buddhist practice (Van Gordon et al., 2016). Prior studies have revealed that positive significant relationships exist between mental health and mindfulness (Desrosiers et al., 2013) and the positive outcomes of applying mindfulness-based techniques for mental distress (Eberth & Sedlmeier, 2012; Khoury et al., 2013). Cecero et al. (2008) studied the relationships between maladaptive schemas and mindfulness. The researcher found a negative relationship between maladaptive schemas and psychological mindfulness except for the abandonment schema (Bishop et al., 2004).

Mindfulness whether enhanced and learned through meditation intervention or dispositional, is constantly related to lower rates of depression and anxiety (Tran et al., 2014). Improved mindfulness skills are known to diminish depressive symptoms later in the prenatal period (Nyklíček et al., 2018), prevent depression relapse (Kuyken et al., 2016), and promote mother and infant well-being (Guo et al., 2020). Previous literature shows mindfulness has a negative relationship with several depressive disorders and their predictors (Carmody & Baer, 2008; Radford et al., 2014). Additionally, if mindfulness increases, the usage of maladaptive schemas would decrease (Arpaci, 2019; Hosseinzadeh et al., 2019; Martin et al., 2018; Yalcin et al., 2017). Grigorian et al. (2020) revealed that the early schemas of disconnection and over-vigilance are negatively related to acting with awareness. Furthermore, mindfulness is reported to be negatively related to impaired limits, however, describing and observing experience (sub-levels of mindfulness) are related to disconnection/rejection.

According to Janovsky et al. (2019), some sides of mindfulness may partially operate the relationship between maladaptive schemas and interpersonal difficulties. A significant relationship was observed between the mindfulness levels of females and the early maladaptive schemas except for the enmeshment, emotional deprivation, pessimism, abandonment emotional inhibition, and entitlement schemas (Shorey, Anderson, et al., 2015). On the contrary, (Shorey, Brasfield, et al., 2015) among males there is a strong negative relationship between mindfulness and early maladaptive schemas, except for entitlement, unrelenting standards, and emotional deprivation. Early maladaptive schemas can be activated when the individuals as adults are unable to enact the healthy adult mode and their mindfulness levels supposedly decrease due to triggered schemas (Thimm, 2017).

As suggested by positive psychology, constructive characteristics in a person should be emphasized rather than negative, in order to bring long-term psychological strength. Likewise, it is essential not to activate individuals' early maladaptive schemas and improve their level of mindfulness. People need understanding and empathy, instead of being criticized harshly, their self needs should be improved, as they need advice to make up for their deficiency, and decrease unrelenting standards. All these factors consequently improve mindfulness (Young et al., 2009). We hypothesized that the negative schemas and postpartum depressions are two negatively influencing factors and the disputing variable that could be enlightened as a positive ray of light in between them could be the mindfulness level of a person. This research intends to spread awareness among researchers and victims of postpartum depression that mindfulness can play an intervening role between two connecting negative factors in a time of despair.

Method

Participants

The current study involved 170 mothers who gave birth from February 2020 to August 2020. The demographic characteristics of respondents were

noted and later on converted to categorical variables to explain the sample characteristics. Respondents' age ranged from 18 years to 43 years old (*M* = 25.73; *SD* = 4.94). Some other demographic properties that were noted, were level of education (8.8% were illiterate, 5.4% were primary graduates, 41.4% were middle school graduates, 44.6% were college graduates), duration after childbirth (1 to 12 weeks passed for 49.50%, 13 to 25 weeks passed for 14.10% and 26 to 36 weeks passed for 36.90%, Duration of marriage (11 to 53 months for 40.00%, 54 to 96 months for 40.20%, 97 to 139 months for 11.40% and 140 to 180 months for 7.50%, and the type of birth (43% C-section delivery and 58% vaginal delivery).

Measures

Data was collected in person through the paper and pencil method using purposive sampling. To ensure validity, all measure items had been translated using the forward-backward method of translation.

Edinburgh Postnatal Depression scale (Naveed et al, 2015)

Edinburgh Postnatal Depression Scale (EPDS) is a renowned self-report 10-item scale. It was constructed for examining postpartum depression. Respondents were asked to answer the questions using a four-point scale that ranges from 0 to 3 (*as much as I always could to not at all*). The total score of the scale was taken by the sum of scores of 10 items (Cox et al., 1987). The composite reliability for Urdu translated scale was .86.

The Young Schema Questionnaire-Short Form (Young et al., 2003)

The Young Schema Questionnaire-Short Form (Young et al., 2003) is a 75-item self-report scale that is used to assess the severity of early maladaptive schemas, which are grouped into five domains. Each of the 15 sub-schemas consists of five items and every item is rated on a six-point Likert- scale that ranged from 1 - *completely untrue of me* to 6 - *describes me perfectly.* The sub-scales composite reliability (Over vigilance/Inhibition, Disconnection/Rejection, Impaired autonomy/Performance, Impaired Limits, Other Directedness) for the current study was .881, .876, .765, .897, and .773 respectively.

Disconnection/rejection is comprised of social isolation, mistrust, and emotional deprivation. Impaired autonomy is explained by dependence, enmeshment, or vulnerability to harm. Impaired limit is defined by entitlement and insufficient self-control. Other directedness is explained by subjugation and self-sacrifice. Lastly, over-vigilance is explained by schemas of emotional inhibition and unrelenting standards.

Kentucky Inventory of Mindfulness Skills (KIMS) (Baer et al., 2004)

Kentucky Inventory of Mindfulness Skills is 39 items scale that measures the four components of mindfulness including acting with awareness, describing, accepting without judgment, and observing (Baer et al., 2004). The scale ranged from 1 - *never or rarely true* to 5 - *always or almost always true*. Internal consistency of scale in the current study found overall .781 and .605 to .797 across subscales.

Results

Study data analysis was carried out using SMART-PLS 3.2.8 (Ringle et al., 2015) to check the indirect effect of early maladaptive schemas on post-partum depression through mindfulness. Early maladaptive schemas domains (Impaired Limits, Impaired autonomy/Performance, Over-vigilance/Inhibition, Other Directedness, and Disconnection/ Rejection,) were considered as explanatory variables and postpartum depression was measured as the criterion variable in the path analysis. Data analysis included the measurement and structural model.

Measurement model

A measurement model was run to assess the convergent validity of the tools used for research and the evaluation was conducted through average variance extracted (AVE). The outer model was validated via a path weighing scheme as suggested by (Garson, 2012; Hair et al., 2012). The outer loading was considered to be significant with a score of .6 (Hair et al., 2011). The psychometric effectiveness was improved by excluding the items with outer loadings lesser than .6. the composite reliability was accepted with a value greater than .6. As

shown in Table 1, AVE, as well as composite reliability, appeared to be satisfactory in the measurement model.

Table 1

The measurement model test

Variables	Composite Reliability (CR)	Average Variance Extracted (AVE)
Postpartum Depression	.825	.758
Mindfulness	.811	.670
Early Maladaptive Schemas	.941	.587
Other-directedness	.800	.567
Impaired autonomy or	.764	.582
Performance		
Disconnection and rejection	.820	.543
Impaired limits	.774	.644
Over vigilance/ inhibition	.901	.544

Structural Model

Direct and indirect relationships were analyzed through bootstrapping technique (Preacher & Hayes, 2008). Dimension vise results have been presented in Figure 1 and comprehensive results are explained in Table 2.

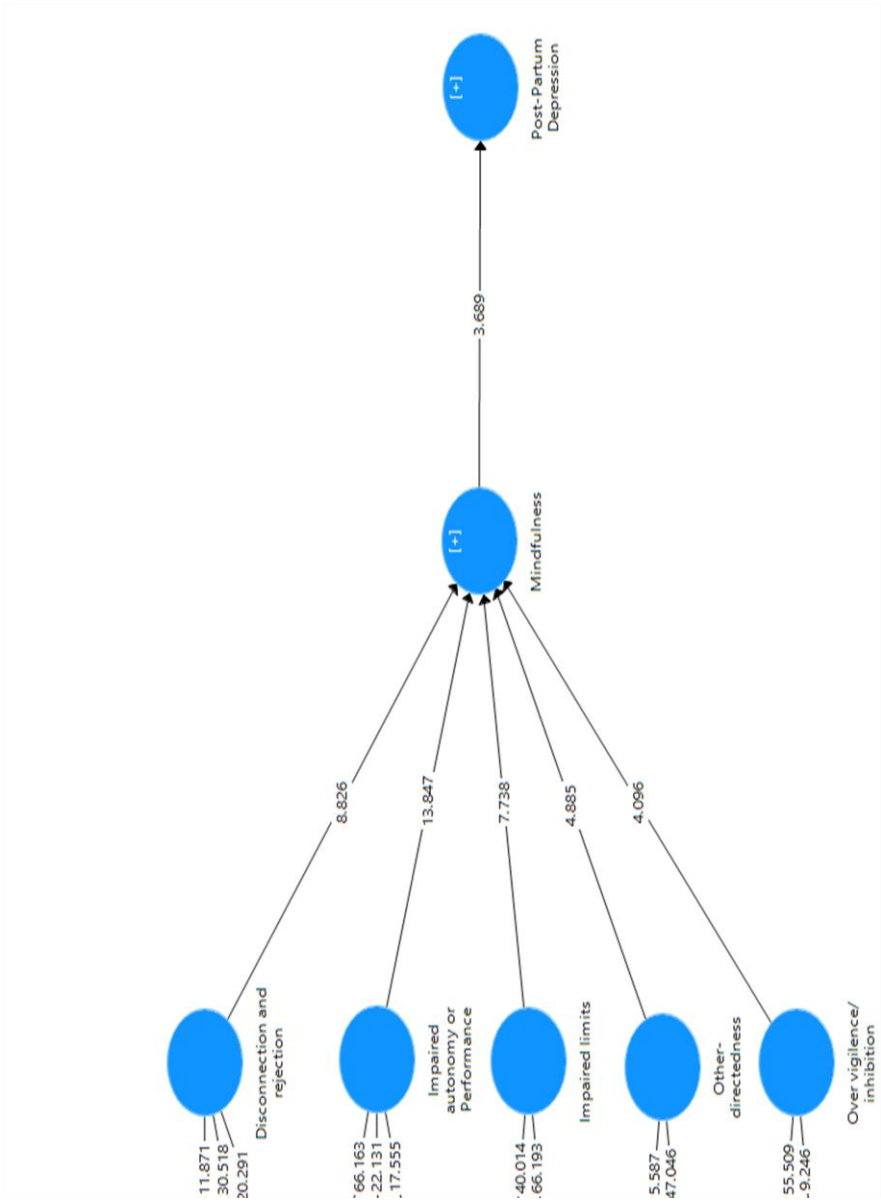

Figure 1. Specific indirect effect

Table 2

Mediation through Mindfulness on Early Maladaptive Schemas and Postpartum Depression

Variables	β	*M*	*SD*	*t*	*p*
Impaired autonomy or Performance -> Mindfulness -> Post-Partum Depression	.147	0.151	0.042	3.506	.000
Other-directedness -> Mindfulness -> Post-Partum Depression	.033	0.035	0.012	2.744	.006
Disconnection and rejection -> Mindfulness -> Post-Partum Depression	.081	0.084	0.024	3.404	.001
Impaired limits -> Mindfulness -> Post-Partum Depression	.056	0.055	0.016	3.447	.001
Over vigilance/ inhibition -> Mindfulness -> Post-Partum Depression	.032	0.033	0.013	2.526	.012

Note. β – standardized beta coefficient; M – Mean; SD – Standard deviation; t – t-test; p – p value.

Five domains of early maladaptive schemas namely (Impaired autonomy/Performance, Other Directedness, Disconnection/ Rejection, and Over-vigilance/Inhibition, and Impaired Limits,) showed significant mediation through mindfulness to postpartum depression. Thus, from these results, we can say that mindfulness mediates the relationship between early maladaptive schemas and post-partum depression.

Discussion

Nurturing an infant is significant life stress and a critical time for mothers. Some mothers encounter trouble adapting to this significant life changes (Sheinkopf et al., 2006). Though most women are resilient towards stress (Holopainen & Hakulinen, 2019), some of them face some psycho-social challenges that threaten their subjective well-being. Consequently, it can disturb daily personal and occupational functioning (Diorgu et al., 2016). This research contributes to existing research related to maternal health.

The current research focused on examining the intervening function of mindfulness between predisposed early maladaptive schemas and post-partum depression in women after giving birth. This conclusion supported prior research (Grigorian et al., 2020) that the EMSs domains of disconnection/rejection, and over-vigilance and inhibition are negatively associated with a sub-level of mindfulness called acting with awareness. Additionally, disconnection/rejection are negatively related to unfolding experiences, and observing encounters and impaired limits are associated to the other four mindfulness facets.

Current study outcomes were supported because five domains of predisposed early maladaptive schemas namely (Other Directedness, Disconnection/ Rejection, Impaired autonomy/Performance, Impaired Limits, and Over-vigilance/Inhibition,) showed significant mediation through mindfulness to post-partum depression. These findings are backed by the propositions of Shorey, Brasfield, et al. (2015) in which early maladaptive schemas and mindfulness separately for females and male substance users are studied. The association between mindfulness and predisposed early schemas is consistent because the occurrence of maladaptive schemas is intervened the level of mindfulness.

A massive body of literature suggests that self-compassion and mindfulness are key methods in appeasing depressive symptoms which might have adverse effects on both the infant and the mother (Luberto et al., 2018; Malis et al., 2017). Improved maternal mindfulness may strengthen positive experience before and after giving birth. Mindfulness may decrease adverse outcomes of unavoidable difficult events and enhance productive coping from these circumstances (Bergomi et al., 2013). Aligned with these propositions, a qualitative study outcome proves that mothers who attend an ante-natal mindfulness based childbirth training program stay more confident during childbirth and after (Fisher et al., 2012). Although, as far we know, no quantitative study investigated the impact of motherly dispositional mindfulness on subjective childbearing experience and postpartum symptoms.

Conclusion

These findings provide significance on the potential advantages of mindfulness-based practices in health advancement outreach endeavors designed for such a population. It could influence mothers' and mothers-to-be' intentions to seek mindfulness-based practices. Developing mental health facilities and intervention and compassion-based approaches that are effective in persuading and motivating mothers to explore the possible benefits from such practices as mindfulness meditation may help the mothers to develop positive attitudes that can provide lifelong mental and physical health benefits. Thus, the present study can be useful in order to enhance subjective well-being by developing mindfulness competency during pregnancy.

Limitations and Future directions

Despite the current study's contributions, few barriers exist that should be addressed. The study outcomes were derived from a small sample of mothers after childbirth from Pakistan. Future researchers should replicate the study with samples from other countries to ensure that the study findings can be generalized across samples. An experimental study can test whether mindfulness-based intervention during pregnancy help to reduce the risk of post-partum depression.

Conflict of interest

We have no conflicts of interest to disclose.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Research Article

Aspects of Mindfulness-Based Intervention to Reduce Anxiety in Adults with Autism: A Delphi Study

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ABSTRACT

Anxiety is a common psychological disorder often experienced by adults with autism. Studies suggest a method called Mindfulness to help reduce the disorder. However, experts have not reached an agreement on what aspects of Mindfulness are appropriate for adults with autism. Using the Delphi technique, the current study aims to gather expert consensus on which aspects of Mindfulness can be used to reduce anxiety in adults with autism. Opinions were gathered from a panel of seven Mindfulness experts for adults with autism and from adults with autism who had experience using this method. There were 35 Mindfulness-based intervention items agreed upon that matched the characteristics of adults with autism, but of these, only 28 were appropriate. The items are distributed in several sections: preparation, exercises, concepts, homework, and facilitating autistic characteristics. This consensus was reached through three rounds. Mindfulness can be seen as an alternative method for reducing anxiety levels in adults with autism, especially during social interactions. In addition, it is also possible to apply in a therapeutic setting. However, several factors need to be considered in advance when this intervention is to be implemented in Indonesia.

Keywords: autism, adult with autism, anxiety, Mindfulness, the Delphi technique

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Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition that begins in childhood and persists into adulthood. Individuals with this disorder usually have deficiencies in communication and social interaction, repetitive and restricted behaviors and interests, and hypersensitivity or hyposensitivity to certain sensory inputs. The prevalence of autistic individuals is estimated at 1% of the population (American Psychiatric Association, 2013).

Approximately 42% of adults with autism experience anxiety throughout their lives (Hollocks et al., 2019). The anxiety they experience is not only in accordance with the Diagnostic and Statistical Manual (DSM) criteria, such as generalized anxiety and specific phobia, but also ASD-specific anxiety (American Psychiatric Association, 2013, Halim et al., 2018).

The anxiety is caused by poor executive functioning (Johnston et al., 2019), an inability to communicate socially, and an inability to cope with uncertainty and change (Halim et al., 2018; Robertson et al., 2018). Having restricted and repetitive behaviors, cognitive differences (Stark et al., 2021), and camouflaging or masking in a social situation (Hull et al., 2017; Schneid & Raz, 2020) can also cause anxiety in adults with autism.

Cognitive Behavioral Therapy (CBT) and Mindfulness-Based Therapy (MBT) are two common intervention approaches for reducing anxiety in adults with autism. CBT was found to be moderately effective for symptoms of depression and anxiety in adults with autism. On the other hand, MBT is more impactful in reducing anxiety in adults with autism (Conner & White, 2018; Kiep et al., 2015; Spek et al., 2013).

Mindfulness, both Eastern and Western concepts, was reported to be significant for people with autism. The Eastern concept which focuses on moment-to-moment awareness of present experiences and the Western concept which focuses on alertness and openness to new information have their respective advantages (Poquerusse, Pagnini, & Langer, 2020). MBT is more suitable if the individual has high irrational beliefs (Sizoo & Kuiper, 2017).

However, inappropriate cognitive restructuring and intervention not adapted to the way of thinking of adults with autism will actually have a more harmful impact on them (Brede et al., 2020).

Not only can MBT help reduce anxiety, depression, and rumination with substantial effects (Spek et al., 2013), but it can also reduce autistic symptoms, improve general mood (Sizoo & Kuiper, 2017) and impulse control (Conner & White, 2018), reduce physical and psychological symptoms such as anxiety and depression, and improve general physical and psychological well-being. These results were found to be stable for 9 weeks after the intervention (Kiep et al., 2015).

In practice, to be applied to adults with autism, MBT still needs some modifications to increase its effectiveness (Stark et al., 2021). Modifications can be made by adapting the total and duration of each intervention session, avoiding ambiguous metaphors and terms, and discussing individual homework plans (Kiep et al., 2015; Spek et al., 2013). Another modification is to provide additional materials, such as the concepts of stress, anxiety, and depression, which are modified according to the characteristics of adults with autism (Conner & White, 2018; Sizoo & Kuiper, 2017).

A study found that it takes the ability to think outside the box in dealing with adults with autism. This ability is related to the need for inventive and initiative thinking to make the given material be understood (Ainsworth et al., 2020).

The ability can only be obtained if the clinician has the confidence and experience and has attended certain intervention training. The lack of research and empirical knowledge, as well as the lack of training on specific modifications of standard anxiety interventions in adults with autism, make the intervention more complicated. Modifications that have been made by clinicians are less effective because they are generally inconsistent, resulting in differences in treatment by each clinician (Ainsworth et al., 2020).

It is therefore important to develop specific guidelines (Robertson et al., 2018) or reach an agreement between clinicians or adults with autism who have

used Mindfulness methods. This study applied the Delphi technique to gather expert opinions to get a consensus on what aspects should be included in a Mindfulness intervention to reduce anxiety in adults with autism. The results of this study are expected to provide guidelines for clinicians, psychologists, or therapists regarding the application of Mindfulness-based interventions in adults with autism.

Method

Research Design

This study uses a modified Delphi technique. In the first round, the researcher distributed a questionnaire based on a predefined module rather than giving open questions to a panel of experts to compose a questionnaire. The module used in this study is the Mindfulness-Based Stress Reduction (MBSR) by Jon Kabat-Zinn (2005; Jon Kabat-Zinn, 2017). In the second round, each expert was asked to rate the items in the questionnaire on a scale of 1 to 9. They were also allowed to give notes in the note column when they wanted to add something uncovered in the questionnaire. The analyzed questionnaire was again sent to a panel of experts in the third round. Each questionnaire was adjusted individually so that each expert could re-evaluate his/her previous assessment. The identified items were then analyzed for appropriateness using the RAND/UCLA Appropriateness Method (RAM) (Fitch et al., 2001).

Ethical approval for the research was granted by the Ethics Committee for Disability Studies, Center for Disability Studies and Services (CDSS) Universitas Brawijaya (31/03/2021; No. 037/UN10.C20.11/PN/2021). In this section, the authors also assert that all procedures in this study are in accordance with the ethical standards of national and institutional committees on human experimentation and with the 1975 Declaration of Helsinki, as revised in 2000.

Participants

Participants or so-called an expert panel in this research are those who have expertise in Mindfulness-based interventions for adults with autism. The expert panel consisted of (1) psychologists, psychiatrists, therapists, or counselors who had ever provided this kind of intervention; (2) researchers with research interest in this issue; and (3) adults with autism who had received the intervention and/or implemented it independently. In this case, adults with autism must have adequate cognitive abilities as evidenced by their IQ scores. The identity of each expert panel is unknown to the other expert panel members.

The research invitations, screening questions, and informed consent were sent to 25 institutions, 12 researchers, and 12 adults with autism and clinicians both nationally and internationally regarding their willingness to participate in this study. The expected number of expert panels was 7 to 15 people, which is considered large enough to represent diversity, but also small enough to allow each expert to engage in a group discussion (Fitch et al., 2001).

Participant Characteristics

Eight participants completed the informed consent, but only seven participants completed all three rounds (M_{age} = 40.8; SD_{age} = 17.13; 57% male). Participants were clinicians (N = 4; 57%) and adults with autism (N = 3; 43%) aged 23-71 years. The adults with autism in this study met the criteria as evidenced by their IQ scores and their current occupation reflecting their adequate intellectual abilities, and they were officially diagnosed as ASD. Half of the clinicians had experience administering this intervention to adults with autism, and the other half had a research interest in this issue. The adults with autism reported that they had implemented the Mindfulness-based intervention independently and all of them lived in Indonesia. Meanwhile, the clinicians were domiciled in Australia (N = 2), the Netherlands, and the United States (Table 1).

Table 1

Expert Panel Characteristics

Participants Characteristics	*N*	%
Gender		
Male	4	57
Female	3	43
Age	*M* = 40.80, *SD* = 17.13	
Diagnosis		
Autism Spectrum Disorder (ASD)	3	43
Neurotypical	4	57
Adult with Autism Occupation		
Undergraduate Student	1	33
Employee	2	67
Clinician Occupation		
Psychologist	2	50
Child Psychologist	1	25
Behavioral Therapist	1	25
Also Researcher	2	50
Clinician Experience with Mindfulness		
>3 years	3	75
7-11 months	1	25
Residence		
Indonesia	3	43
Australia	2	28
The Netherlands	1	14
United States of America	1	14

Data Collection and Analysis

Round 1

The Mindfulness-Based Stress Reduction (MBSR) module by Jon Kabat-Zinn (2005; Jon Kabat-Zinn, 2017) and a literature review on Mindfulness-based interventions in adults with autism was used to develop the questionnaire. In each round, the expert panel was asked to provide their rating, from 1 ("*not effective*") to 9 ("*very effective*"), of "How effective is each item at reducing anxiety in adults with autism?" They were also allowed to add comments in the "Notes" section.

Round 2

After completing the informed consent as a statement of willingness, the questionnaire and general instructions were emailed to the expert panel. The experts were expected to assess the first questionnaire for a maximum of two weeks. The experts were alerted on day 7 and day 10 and asked if further assistance was needed.

Descriptive statistics were applied to the results of this round. A statement was said to reach agreement when 60% of the experts rated it 6 to 9 (Consensus is reached for inclusion). Meanwhile, an item was considered not to reach agreement when less than 60% of the experts gave a rating of 6 to 9 (Consensus is reached for not being included). Items that were not agreed upon were brought to Round 3 along with the new items obtained from the experts` comments.

Round 3

The questionnaires in this round were individually adjusted based on the experts` previous assessments and the median scores of all experts` assessments. Descriptive statistics were applied once again to the results to find which items reached the final consensus. The items that reached the final consensus were then analyzed for their appropriateness using the RAND/UCLA Appropriateness Method (RAM).

An item is considered appropriate when the median score of all experts` assessments is 7 to 9, with no disagreement. An item is considered uncertain when the median score of all experts` assessments is 4 to 6, or there is a disagreement. An item is considered inappropriate when the median score of all experts` assessments is 1 to 3 (Fitch et al., 2001). The flowchart is given in Figure 1.

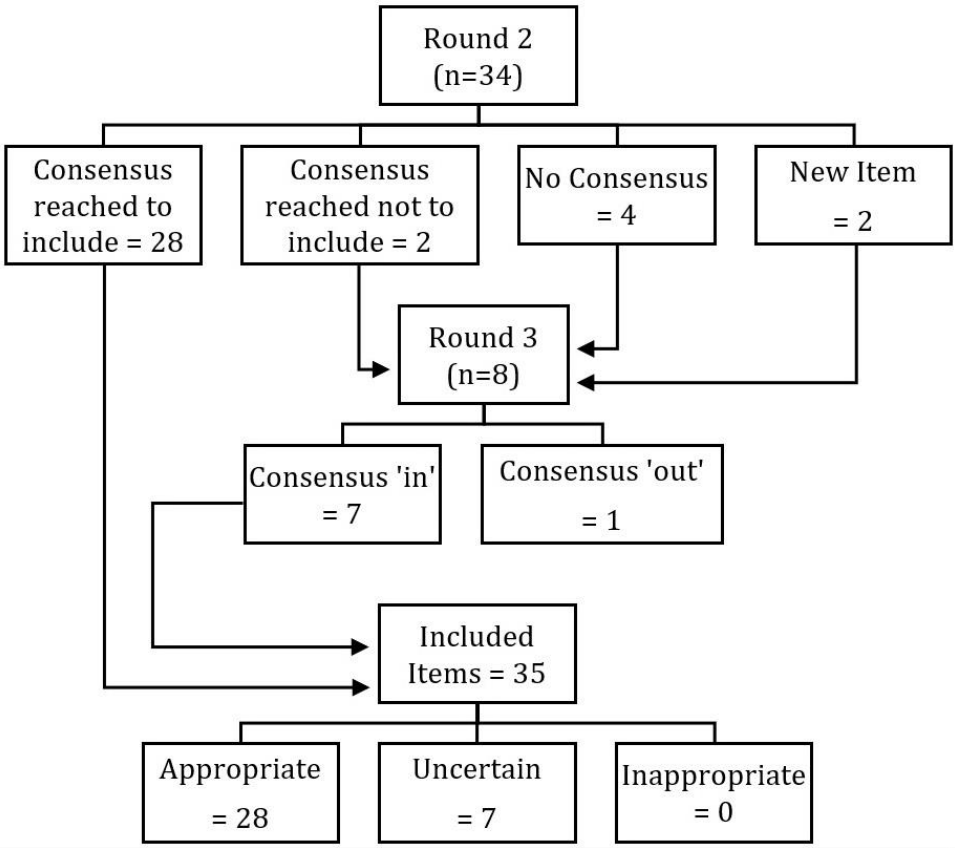

Figure 1. The Flowchart in Each Delphi Round

Results

Round 1

Based on the literature review, 34 statements were obtained and were divided into five sub-sections: Preparation, Mindfulness Practice, Concept, Homework, and Facilitating Autistic Characteristics. The prepared questionnaire had been reviewed by experts and was then translated into English and proofread by the English language professional to make both national and international experts have the same and equal understanding.

Round 2

The results of the descriptive analysis found that 28 statements fell into "IN" consensus, two statements were "OUT" consensus, and four statements were "NO" consensus". Besides, two new statements obtained from the experts` comments were added to the "Facilitating Autistic Characteristics" sub-section, namely "*Reconfirming the participants' understanding (double-check) regarding the material and instructions given*" (E6) and "*Providing visual aids to help participants understand each explanation given*" (E7). Statements categorized in the "IN" consensus were directly included in the analysis of the results. Meanwhile, statements that fell into "*NO*" and "*OUT*" consensus were re-included in the next round along with two new statements.

Round 3

Of the eight statements included in round 3, the statement "*Teaching Yoga techniques such as standing yoga, mindful hatha yoga, lying-down yoga*" (B4) did not reach an agreement ("*OUT*" consensus), while the other seven statements reached an agreement and were included in the RAM analysis. Out of 35 statements, 28 were appropriate and seven were uncertain.

These "*appropriate*" and "*uncertain"* labels are related to the priority of delivery in the intervention. Appropriate statements mean that they should be provided to each client. Uncertain statements, on the other hand, are to be given after considering the client's condition in advance (adjusting). If the condition is possible, it can be provided to the client. However, if it is not possible, it does not need to be given to the client (Table 2).

Table 2

Items Reaching Consensus

	Preparation	RAM Analysis
A1.	Providing an outline of the interventions to be carried out	Appropriate
A2.	Asking for a commitment to be willing to carry out a series of exercises within and outside the intervention session actively	Appropriate
A3.	Describing emotions (joy, sad, angry, etc.) with concrete explanations before starting the Mindfulness session	Appropriate
A4.	Explaining or providing cautionary of any possible emergence of feelings of sadness, anger, or fear during the intervention session that might be causing discomfort	Appropriate
	Mindfulness Practice	RAM Analysis
B1.	Practice awareness of breath (AOB)	Appropriate
B2.	Teaching simple ways of paying attention and being aware of thoughts, feelings, and sensations in the current state	Appropriate
B3.	Explaining how to refocus attention while doing Mindfulness practice by not forcing to eliminate certain thoughts, just simply "let it be" and "let go"	Uncertain
B5.	Teaching Meditation techniques that can be done such as sitting meditation, or walking meditation, etc. for focusing attention on breathing	Uncertain
B6.	Teaching body scan techniques	Uncertain
B7.	Teaching several activities that can be done with full awareness such as mindful eating, speaking, and listening, to practice focusing attention on the current state	Appropriate
B8.	Discussing the feelings after doing a Mindfulness exercise	Appropriate
B9.	Discussing what can be done to improving Mindfulness practice on the next session	Uncertain
	Concept	RAM Analysis
C1.	Explaining what Mindfulness is	Appropriate
C2.	Discussing the connection between mind and body sensations when an unpleasant experience happens	Appropriate

C3.	Recognizing the stressful pattern, understanding their feelings, and how to express them accurately	Appropriate
C4.	Recognizing the physical feelings and sensations that can be aroused when someone is feeling anxious	Appropriate
C5.	Identifying things that can be anxiety stressors	Appropriate
C6.	Developing more effective ways to respond to negative situations positively and proactively, so that would be able to cope with unpleasant experiences (anxiety) faster	Appropriate
C7.	Focusing on individual capacity to adapt to daily challenges, stress, and anxiety in a daily setting in faster and more effective ways	Appropriate
C8.	Focusing on responding (than reacting) to anxiety stressors	Appropriate
C9.	Adopting Mindfulness for learning to stop, take a step back, and then see things clearer and more objective so that would be able to make a decision better	Appropriate
C10.	Improving individual capacity for more effective self-regulating and anxiety coping	Appropriate
C11.	Improving effective and creative internal communication skills, especially related to challenging things	Appropriate
	Homework	RAM Analysis
D1.	Providing recording of meditation and yoga exercise guides to be done outside the session	Appropriate
D2.	Providing handout for recording weekly tasks	Appropriate
D3.	Choosing one full-awareness daily routine activity (such as brushing teeth, watering plants, cleaning home) to be done outside the session	Appropriate
D4.	Identifying stress and anxiety reactions that can automatically occur and events that cause deadlock or difficulty to do activities	Appropriate
D5.	Improving self-awareness when reacting to something and finding the right choice to more mindful respond	Appropriate
	Facilitating Autistic Characteristics	RAM Analysis
E1.	The facilitator should be understanding the characteristics, the best way of communication, and the sensitivity of every adult with autism client	Appropriate
E2.	Providing individual sessions on every meeting to ensure the understanding of each client	Uncertain
E3.	Eliminating the use of metaphors or words that have multiple meanings	Appropriate

E4.	Permitting every client to take breaks if needed	Appropriate
E5.	The facilitator should be cooperating with every client's significant others to ensure homework to be done outside the sessions	Appropriate
E6.	Double-checking participants by confirming their understanding while giving instructions and materials	Uncertain
E7.	Giving visual aids to help participants understand every given explanation	Uncertain

Discussion

This research is in line with the findings of a research review by Poquerusse, Pagnini, & Langer (2020) that Mindfulness training for individuals with autism is a powerful and promising way for them. Therefore, an effective Mindfulness program for people with autism needs to be created. This current study found 35 items grouped into five sub-sections: preparation, practice, concept, homework, and facilitating autistic characteristics. Of the 35 statements, 28 were categorized as appropriate and seven were uncertain.

In the first section, preparation, all statements reach consensus and are deemed appropriate. An agreement on the statements in this subsection is easier to reach since they are general therapeutic competencies that are more likely to get the same views from experts from different backgrounds than a specific technique of a particular intervention approach (Taylor et al., 2020). Understanding the emotions of adults with autism before starting an intervention is considered important, as stated by Ainsworth et al. (2020) and Spain et al. (2015) that understanding the emotions of adults with autism at the outset is important before starting the intervention session using certain techniques in the autistic group.

In the second section, Mindfulness practice, the core practices that reach an agreement (appropriate) are the concrete activities that can be felt directly by the five senses. The result is in accordance with the characteristics of individuals with autism who are easier to understand concrete and detailed things (Hobson, 2012; Spek et al., 2013). The more concrete and detailed the instructions, the more likely they are to understand the instructions (Happe &

Frith, 2006). Meanwhile, the uncertain Mindfulness practices are the activities that require concentration and complex cognitive understanding. This statement can only be given to adults with autism who may have this ability.

One of the core Mindfulness characteristics that doesn't reach consensus is yoga. There are several explanations why yoga does not reach an agreement, especially if it is applied in Indonesia. The understanding of the term "yoga", the strong belief in their religion, and the local tradition of Indonesian can influence their perspective about yoga.

In Indonesia, yoga which was originally brought by monks is often considered part of a certain religion, Hinduism. The majority of Indonesians, of whom 87.2% are Muslim and only 1.7% are Hindu (Central Bureau of Statistics, 2010), commonly have a different view of yoga. Based on the *fatwa* of the Indonesian Ulema Council (Majelis Ulama Indonesia - MUI) in 2009, pure yoga is a religious ritual activity and contains meditation and mantras which are considered *haram* or forbidden and a sin for Muslims (Komisi Fatwa MUI, 2009).

Nevertheless, yoga is one of the Complementary and Alternative Medical (CAM) Interventions often used by adults with autism to improve their well-being, address specific symptoms, and find solutions to address major autistic symptoms (Barnett et al., 2014).

This study found that the main aspects of yoga that balance the mind, body, and soul are still possible to be applied if it is adapted to Indonesian traditional values. Related to this, Tucker (2013) explains that interventions that are suitable to be applied to people with autism in Indonesia, especially in Java, are those that have been adapted to the community values or local daily practices and which can increase pride in their local/national identity. In this case, using Javanese traditional music called gamelan as a therapeutic tool will increase their likelihood to use this particular approach. Using the local values will make the adults with autism feel confident and secure (Tucker, 2013).

In the third part, Concepts, all items reach consensus and are considered appropriate. All concepts need to be given to adults with autism, but they need

to be adapted to each individual's understanding, according to the aspects in the sub-section 'facilitating autistic characteristics' of each participant.

In the fourth section, Homework, all items reach consensus and are considered appropriate. With weekly handouts and activity lists in hand, adults with autism can be more comfortable because they already know what will happen during the intervention session, thereby reducing the possibility of anxiety due to uncertainty and changes.

The fifth sub-section is Facilitating the Autistic Characteristics of each Participant. This consensus is in line with the results of research conducted by Ainsworth, et al., (2020) regarding the importance of continuous support from significant others such as family or closest friends in dealing with long-term anxiety in adults with autism (Ainsworth, et al., 2020). Uncertain statements in this subsection refer to practitioners who need to understand the condition of each individual (*i.e,* whether individual sessions, double checks on understanding, and the provision of visual aids are needed). If they are not needed, they need not be provided.

Limitation

First, the absence of a standardized definition of a consensus (Diamond et al., 2014) made researchers set their own standards. The difference in the selection of agreement norms, being tighter or looser, will allow for differences in research results (Taylor, et al., 2019). Second, Mindfulness has not been regarded as the best-practice therapy for adults with autism, so there are not many experts/researchers in this field. As a result, the response of the willingness given by the expert is not much (low-response rate). On the other hand, the researcher also realizes that it is very likely that there are experts out there the researchers do not know about.

Despite the limited number of experts that were willing to participate, they still met the minimum standard of between 7-9 people (Fitch et al., 2001). To increase the validity and obtain larger perspectives or alternatives, the expert panel of this study was also gathered from various backgrounds such as

psychologists, researchers, and even adults with autism themselves who are the main target of the intervention (Powell, 2003).

The prospect of Mindfulness-based intervention application to adults with autism is still confined to those who have adequate cognitive abilities or intelligence. There is not much evidence that adults with autism with intelligence disorder can benefit from the intervention.

Conclusion

In preparation, the therapist needs to provide an explanation of the intervention to be carried out as well as an explanation of the various emotions. Mindfulness practices that are suitable for adults with autism are the practice of awareness of breath (paying attention to what is happening right now) and some mindful activities that can be done outside of counseling sessions such as mindful eating, speaking, and listening. Besides, the therapist also needs to provide a concept about recognizing situations that can be a source of anxiety and also how to increase self-capacity in dealing with anxiety. Concepts are given according to the abilities of each autistic adult and the type of facilitation needed.

In addition, giving homework and facilitating autistic characteristics are also important. The therapist must really understand the characteristics and sensitivities of each individual, eliminate ambiguous sentences, and the importance of building cooperation with significant others to ensure whether the practice of Mindfulness is well-implemented outside the session.

Based on the limitations, it is recommended for further researchers to expand the potential participants. Mindfulness practitioners are advised to increase their understanding of the characteristics of autism to make adults with autism better understand the concepts provided. As for adults with autism who experience anxiety, it is recommended to use this intervention either formally by following a structured intervention by an expert or independently by following the important aspects found in this study.

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Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Research Article

Guided Mindfulness-Acceptance Self-Help Intervention for Dysphoric Students: Preliminary Findings

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ABSTRACT

The purpose of this pilot study was to test the efficacy of a novel self-help program called Attention training (AT) based on the mindfulness-acceptance principles in a sample of dysphoric students. We tried to determine if the program: a) contributed to immediate and follow-up changes in the presumed components and mechanisms of mindfulness-acceptance - psychological flexibility, attention control (switching and updating), and rumination; b) was followed by a reduction in dysphoric symptoms; c) had different effects depending on a different order of exercises within AT. The final sample consists of 18 students from the University of Novi Sad, 19-29 years old with mild and moderate depression (selected through pre-screening procedure). Data were collected at 4 measurement occasions: before the first group meeting (pretest), right after completion of all exercises (posttest), and two follow-ups - one and three months post-treatment. AT consisted of 8 small-group, weekly meetings (up to 5 persons and < 90 minutes of overall therapist support). Participants listened to the audio-recorded exercises that targeted the somatic, emotional, and cognitive domains. The sample was randomly split into two groups with a different order of the emotional and cognitive exercises. We found that AT, as a self-help intervention, can potentially lead to improvements in the mindfulness components and mechanisms, even though an increase in the depressive symptoms was noticed. Different explanations were provided for such findings, including suggestions for further optimization of the program and recommendations for further research.

Keywords: self-help, attention training, mindfulness-acceptance, ruminations, dysphoric symptoms

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Introduction

According to the WHO reports, depression contributes largely to the overall burden of disease in a number of countries across the globe (https://www.who.int/news-room/fact-sheets/detail/depression). Depression is a heterogeneous mental condition symptom-wise and regarding its age at onset. It can start in childhood, adolescence, or different adulthood periods (Zisook et al., 2007). Earlier age at onset is associated with a number of clinical indicators such as severity, chronicity, mental and physical co-morbidity, suicide risk, and dysfunctionality (Zisook et al., 2007). Hence, early intervention might preclude development of more serious, clinical types of depression. Addressing depression in a timely manner is particularly important given the fact that the rates of depression in young people, such as students, tend to be high (e.g., 24.4%; Akhtar et al., 2020). A number of evidence-based therapies exist currently that can ameliorate this condition. Within the past two decades so called third wave of behavior and cognitive therapies have been popularized owing to their scientific background and empirical support. For example, Mindfulness-based cognitive therapy (MBCT; Segal et al., 2013) and Acceptance and commitment therapy (ACT; Hayes et al., 1999) are examples of therapies that emphasize mindfulness and acceptance, respectively. Both therapies are multi-component interventions that require substantial resources in terms of education of therapists, their availability, and affordability (Cavanagh et al., 2014). It has been suggested that provision of mindfulness and acceptance interventions in a self-help format (e.g., via books, audio-visual material) could be an effective way to address the problem of insufficient resources (Cavanagh et al., 2014). Also, research results suggest larger effects for guided (some contact with a therapist) than unguided self-help interventions (e.g., Cavanagh et al., 2014; Gellately et al., 2007). Hence, self-help seems an attractive option, especially for low- and middle-income countries (Novović et al., 2019), and for those people whose symptoms have not yet reached the alarming threshold. One challenge while adopting any multi-component therapy to a self-help format is what component(s) to select and in what order to provide these components in order

to assure efficacy of the self-help format. Hence, the main focus of the current study was creation of mindfulness-acceptance self-help intervention targeting young people with mild to moderate depression symptoms. By reviewing what is known currently about the components and mechanisms of mindfulness and acceptance interventions, we wanted to select the components that were deemed both suitable for self-help format and empirically supported so far.

Mindfulness/acceptance: definition and components

Mindfulness is defined as "paying attention in a particular way, on purpose, non-judgmentally, to the present moment" (Kabat-Zinn, 1994, pp. 4). This particular way of paying attention to the present moment is fostered through various exercises including meditation, body scanning, and breathing (Kabat-Zinn, 1994). In order to attain beneficial effects, a person doing mindfulness exercise needs to bring another component into play, an attitude of openness and acceptance even when facing uncomfortable internal events (Bishop et al., 2004). The person learns to be a non-judgmental observer of inner experiences rather than his/her own harsh critic (Kabat-Zinn, 1990). Mindfulness, defined in this manner, is a crucial component of MBCT. During the initial stages of this structured group therapy, individuals learn to observe their "automatic pilot" i.e., a tendency to follow their wandering mind unquestionably and respond automatically without considering a possibility that there is another, more functional response (Segal et al., 2013). In order to switch from this automatic to a new, so-called, "being" mode of functioning, during initial phases of the treatment, MBCT participants are taught various exercises such as body scan, yoga, breathing space, and acting mindfully during everyday activities (Segal et al., 2013).

Mindfulness has been an integral part of ACT from its inception, even though the creators of this therapeutic approach used different terminology to describe it. Namely, the main goal of ACT is to build psychological flexibility (PF) (Hayes et al., 1999; Hayes et al., 2004). PF is defined as "the ability to fully contact the present moment and the psychological reactions it produces as a conscious

person and to persist or change behavior in the situation in the service of chosen values" (Fletcher & Hayes, p. 319). According to Hayes et al. (1999), PF is a result of activation of the following processes: acceptance, defusion, contact with the present moment, self-as-context, values, and committed action. The first four components are actually mindfulness components (Fletcher & Hayes, 2005). Hence, mindfulness, according to ACT, encompasses the following abilities: to observe internal events as passing objects in our awareness without a need to struggle with them, to be willing to accept own experience as it is without a need to change it, to focus attention to the present moment, and to change a self- perspective (i.e., to free oneself from learned conceptualizations about the self which are often highly evaluative) (Fletcher & Hayes, 2005). Different from MBCT which is fairly structured and begins by teaching people how to focus attention to the present moment through more formal mindfulness practice, ACT relies more on shorter and less formal mindfulness exercises including an abundant use of metaphors (Segal et al., 2013; Hayes et al., 2004). Additionally, ACT is more flexible in terms of order of interventions and argues that therapeutic work can start from any component constituting psychological flexibility, depending on the actual client (Hayes et al., 2004). However, both therapies have a solid evidence base for their efficacy in currently depressed individuals (for meta-analytic reviews see Goldberg et al., 2019 and Gloster et al., 2021).

Ruminations as a mechanism of action

One unresolved question in the literature is via which mechanisms the different components of mindfulness-acceptance lead to better subjective well-being (Shapiro et al., 2006; Wolkin, 2015). It seems that the proponents of MBCT and ACT converge in their thinking about this issue. They seem to argue that being caught in a web of one's own thinking leads to an unhealthy habit of our mind called ruminations (Segal et al., 2013; Hayes & Smith, 2005). Hence, in addition to fostering mindfulness-acceptance skills as a way of alleviation of human suffering, MBCT and ACT rely on the assumption that they exert their effects, at least partly, by decreasing depressive ruminations (Desrosiers et al.,

2013; Perestelo-Perez et al., 2017; Ruiz et al., 2016; Segal et al., 2013; van der Velden et al., 2015; Wolkin, 2015). Depressive ruminations represent a form of cognitive overinvolvement i.e., a form of repetitive thinking about the possible causes and consequences of one's negative mood (Nolen-Hoeksema, 1991). The deleterious effects of depressive ruminations on mood stem not so much from a focus on the negative affect (Lyubomirsky & Nolen-Hoeksema, 1995), but from the judgmental and evaluative nature of self-focused attention (Rude et al., 2007).

Components and mechanisms of the self-help program

MBCT and ACT served as the main forms of the mindfulness-acceptance interventions from which we wanted to build a self-help program targeting dysphoric students. Even though the descriptions of the main processes in these two approaches differ, it seems that both emphasize, at least, the following components of mindfulness-acceptance: attentional skills, body awareness, emotional regulation (e.g., exposure, non-avoidance), and adopting a stance of an impartial observer of one's inner experiences as passing mental events (Hölzel et al., 2011). According to some authors, building attentional skills is a starting point which fuels and propagates other mindfulness-acceptance components (Carmody, 2009; Chiesa & Malinowski, 2011; Hölzel et al., 2011). So, focusing attention on a particular stimulus and re-focusing it when it wanders away could be a prerequisite for further change. Also, research supports the view that attentional skills are one important component of mindfulness (Brown & Ryan, 2003; Hölzel et al., 2011; Lutz et al., 2008; Malinowski, 2013; Verhaeghen, 2021). In accordance with this literature and views, the initial phase in our self-help program included exercises that required focusing attention on one's body and its sensations. Participants were asked to focus on their breath, then they were guided to expand their awareness to include the whole body. Hence, this type of exercise requires a combination of attentional faculties: ability to focus on a particular object, ability to redirect attention once it wanders, and ability to notice all internal experiences as they appear (Sumantry & Steward, 2021; Wolkin, 2015). Given the complexity of the attentional skills and the type of mindfulness exercises our participants practiced, we expected to find effects on updating

and switching (Huizinga et al., 2006; Miyake et al., 2000; Miyake & Friedman, 2012). Updating and switching represent those aspects of executive control responsible for constant updating of working memory for relevant information and shifting from one stimulus to the next (Miyake et al., 2000). Additional components of the mindfulness-acceptance interventions that were included in the self-help program included emotional regulation (acceptance, exposure) and the cognitive component (decentering or defusion). Acceptance represents an emotional regulation strategy and willingness to experience internal events, as they appear and when they appear, without a need to avoid or modify them in the service of valued life (Hayes et al., 1999). Others defined non-acceptance as having negative reactions to negative emotions (Gratz & Roemer, 2004). Decentering and defusion are the constructs developed within MBCT and ACT, respectively. A common theme for these two constructs is the ability to observe one's own thoughts as passing mental events which can free a person from an unhealthy habit of identification with thought content (Hayes et al., 2004).

Although there is some agreement on what components constitute mindfulness-acceptance, we still do not know much about their interaction, if there is a particularly effective order of their implementation, generalizability, cost-effectiveness, and optimization. Other than the suggestion that the first step during practice should be cultivating attentional skills, it is an open question what component should come next. Hence, we wanted to check whether the order of exercises (emotion-focused followed by cognitive exercises, or vice versa) matters in terms of the size of effects and sustainability of the effects. If we knew in more detail how mindfulness works, we would be closer to targeted interventions and could provide better training program optimization. This is especially important when it comes to self-help programs, which are economical forms of assistance that could be effective surrogates for longer-term programs.

Purpose of the study

In order to start answering some of these questions, we designed a guided mindfulness-acceptance self-help program termed “Attention training”

(AT). Even though the program included exercises focusing on the body, emotions, and cognition, the term AT was used to highlight the importance of a non-judgmental kind of attention while focusing on different domains (body, emotions, or cognition). We examined whether significant changes could be achieved with a minimum participation of trainers, in a sample of dysphoric students. We explored if AT has positive effects on the processes of attention (switching and updating) and psychological flexibility, on the one hand, and ameliorating effects on ruminative thinking and the symptoms of depression, on the other. Changes were explored immediately upon completion of the program and at two follow-ups. In order to gain an insight into the question of whether the order of different mindfulness-acceptance components matters, two groups of students were recruited receiving a different order of exercises (body, emotion, cognition vs. body, cognition, emotion). Finally, this study can be considered a pilot study. It is a recommendation that this type of study is conducted first, as an initial step, while testing the efficacy of new interventions or while assessing a possibility for a successful implementation of a novel program despite a small number of subjects (e.g., Leon et al., 2011; Tickle-Degnen, 2013).

Methods

Sample

The initial sample consisted of 22 participants, but after the exclusion of those with incomplete data, 18 were kept for further analyses. All participants were students from the University of Novi Sad, 19-29 old (M_{age} = 22. 95; SD = 3.06; 59% males) who were selected based on a pre-screening with the Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001). The students were invited via online posts that were shared across various social groups. The students that scored over the cut-off 4 and under 15 (mild and moderate depression; Kroenke et al., 2001) were invited for further evaluation. Two clinical psychologists interviewed 60 preselected participants using the DIAMOND - a semi-structured diagnostic interview for the DSM-5 psychiatric disorders (Tolin et al., 2013) to

exclude those that had other disorders and suicidal ideation and tendencies. The excluded participants were informed about other treatment options. This study was approved by the Ethical Board of the Faculty of Philosophy, University of Novi Sad. All participants signed informed consents and received feedback upon completion of the study.

Materials

All instruments were administered 4 times: just before the first group meeting (pretest), following completion of all exercises (retest), one- and three-months post-treatment. A depression screening instrument was used during recruitment, one month before the program commenced. Its subsequent administrations followed the same timing as the rest of the instruments.

Mindfulness-acceptance scales:

The Acceptance and Action Questionnaire (AAQ; Bond et al., 2011) is a self-report measure of psychological inflexibility or the tendency to avoid distressing internal experiences (e.g., thoughts, emotions, somatic symptoms), and to become entangled with the web of own thoughts. We used an 8-item version of the instrument because it was successfully used in previous research with different Serbian populations - Cronbach α = .82 - .85 (Kovač, 2014; Lazić et al., 2013; Stamenić, 2013). A higher score indicates greater inflexibility.

The Ruminative Thought Style Questionnaire (RTSQ; Brinker & Dozois, 2009) is a 20-item measure describing positive, negative, and neutral facets of global rumination. Respondents rated each statement on a 7-point Likert scale. In the previous studies, the RTSQ demonstrated high internal consistency of .94 (Mihić et al., 2019).

Two cognitive control tasks, adapted from Miyake et al. (2000), measuring switching (Local-global) and updating (Letter memory) were used (Purić, 2013):

In the *Local-global task* Navon figures, consisting of larger, global geometric figures made of the same smaller ones, were presented in three blocks. Figures in black and red were depicted in the first and second blocks,

respectively. Participants were asked about the number of lines that constitute a bigger shape in the first and a smaller one in the second block. In the third block, red and black figures were presented interchangeably, and the task was to indicate the number of lines in local or global shapes depending on the color. The deterioration of performance in the third block in regard to the average of the first two blocks represents the cost of switching. It is presented in seconds, and lower results indicate poorer switching.

The *Letter memory task* consists of 12 lists of letters of different lengths while the task was to reproduce the last four presented letters in each list. The measure of updating is the proportion of correctly reproduced letters in all lists. Better updating goes with higher results.

Depression - The Patient Health Questionnaire - 9 (PHQ-9; Kroenke et al., 2001)

The Patient Health Questionnaire - 9 (PHQ-9; Kroenke et al., 2001) is a 9-item measure designed to assess the symptoms of depression according to DSM-IV criteria. Respondents were asked to rate how often they were bothered by each symptom over the past 2 weeks on a scale from 0 (*almost never*) to 3 (*almost every day*). Cronbach's α in Kroenke et al.'s study was 0.89 (2001).

Procedure

The self-help program commenced one month following the initial screening. The training consisted of 8 small-group weekly meetings (up to 5 persons and < 90 minutes of overall therapist support) during which participants listened to the audio-recorded exercises. The program was delivered within one month, after which participants were contacted one month and three months for follow-ups. The sessions were followed by brief instructions related to practice and potential obstacles during home-based training. There were three sets of exercises that targeted somatic, emotional, and cognitive domains, and each set was covered by two exercises. The final two exercises represented an integration of previously practiced components. The sample was randomly split into two groups in which the order of emotional and cognitive exercises was reversed, while the somatic and integration parts were fixed as the first and last

tasks, respectively. Therefore, we had an Emotion-first group (n = 8) (body-emotion-cognition-integration order), and a Cognition-first group (n = 10) (body-cognition-emotion-integration order) (Figure 1).

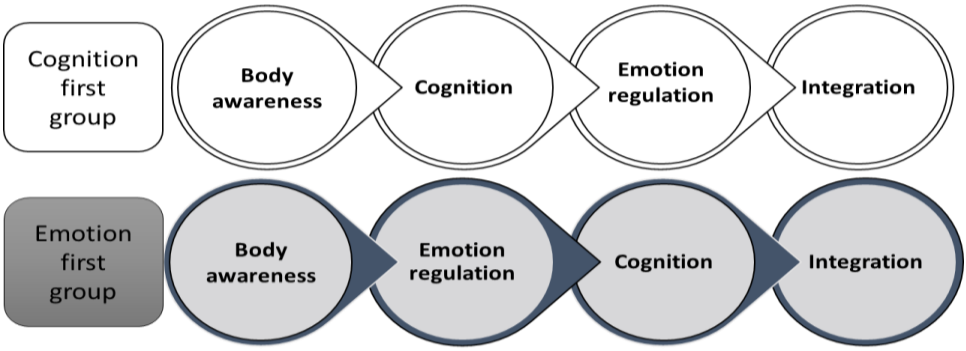

Figure 1. The order of exercise domains in the two groups.

The body awareness part consisted of initial mindfulness exercises where participants learned how to focus on their body, body sensations, and sensory experiences of breathing. The idea was to develop an awareness of what is happening to them in the present moment and to slowly return attention to their body and breathing if their attention wandered.

The emotional part consisted of emotional regulation exercises. Participants were instructed to focus on their strong emotions and approach them in a non-judgmental and accepting way. The goal of these exercises was not to free a person from some emotions but to let them into the field of consciousness without fighting and resisting, with a stance of openness and interest.

The goal of exercises in *the cognitive part* was to observe thought contents in a particular way. A person learned to treat his/her thoughts as transient contents within a larger context of awareness, without attachment or resistance (like leaves floating down a river).

The integrative part included a combination of exposure to different sensations, emotions, and thoughts that were present in the field of

consciousness. Participants were encouraged to remain curious and open to everything they experienced, whether it was a pleasant or an unpleasant experience. The idea was to take that openness (mindfulness) and transfer it to other situations in life.

Analyses

Five profile analyses were used to assess immediate and follow-up changes due to our program on a set of dependent measures. The two groups with different exercise orders represented an independent variable. Profile analysis was chosen because it enabled us to test the following:

1. Whether psychological inflexibility, rumination, executive functioning, and depression symptoms changed from one measurement occasion to the next, independent of the groups. In profile analysis, this is known as the "flatness hypothesis" (i.e., were the profiles flat or were there differences from one time-point to the other). A significant multivariate test of the within-subjects effect suggests that a profile was not flat.
2. Whether, on average, the two groups differed in their overall achievements on each dependent measure, which is known as the "levels hypothesis". A significant between-subjects effect would suggest that the groups differed.
3. Whether the groups had a similar or different pattern of changes on a set of dependent measures over the course of the training and follow-ups. This is known as the test of "parallelism". A significant multivariate effect of the time x group interaction would indicate that the profiles were not parallel.

A rejection of the flatness hypothesis was followed by the t-tests with Bonferroni correction to reveal if the differences between the first and the three after-treatment measurements were significantly different and whether the changes were sustained during follow-ups. A significant test of the parallelism was followed by the tests of the simple main effects.

Our data met all assumptions necessary for profile analysis. First of all, there were more participants in the smallest cell than dependent variables, so although the sample was small, we didn't violate the recommended rule. As can be seen in Table 1, skewness and kurtosis for all variables were within the appropriate range (skewness between -2 to + 2 and kurtosis between -7 to + 7) (Byrne, 2010; Hair et al., 2010). The skewness value for Switching was slightly above the threshold, which can be considered a mild departure from normality. None of the Box`s M tests was significant at $p < .001$ (Tabachnick & Fidell, 2007).

Results

Descriptive statistics

The two groups did not differ in their initial levels of depression, ruminations, psychological flexibility, updating, switching, and overall home practice after each session (Table 1). As can be seen, participants in both groups experienced mild depressive symptoms at the beginning of the program. A table of correlations among the measures across four measurements can be found in Appendix A. As can be seen, the majority of variables displayed an expected pattern of correlations given the previously cited literature. Also, increases in the correlations were observed at three-month follow-up probably due to an increase in the level of depression and its variability.

After the training, during debriefing, a majority of participants reported that involvement in the program was a pleasant experience (95%) and that they mostly did not experience a decrease in mood (73%). Out of those who experienced mood worsening, only 1 participant attributed these changes to the program. All participants declared that they would recommend the training to their friends and acquaintances, and 83% accepted participating in a group therapy that was offered after AT to those who were willing to continue their self-exploration.

Table 1

Descriptive statistics for two groups and the total sample: pretreatment values

	Emotion *M (SD)*	Cognition *M*(*SD*)	Total M(SD)	*t*(16)	*p*	*Sk*	*Ku*
Depression	7.25 (1.83)	8.10 (2.88)	7.72 (2.44)	0.72	.48	1.15	1.43
Ruminations	72.50 (18.36)	71.30 (18.81)	71.83 (18.07)	0.14	.89	0.19	-1.13
Psy. inflexibility	31.25 (8.71)	29.70 (8.56)	30.39 (8.41)	0.38	.71	0.64	-0.66
Updating	.73 (.09)	.65 (.12)	.69 (.11)	1.49	.16	-0.14	-0.59
Switching	580.76 (362.31)	-576.23 (200.97)	-578.24 (274.32)	0.03	.97	-2.57	6.81
Home practice*	28.37 (16.13)	23.10 (13.78)	25.44 (14.66)	0.75	.47	1.32	1.32

Note. * Home practice = overall time (hours) spent in home practice across the duration of Attention training; Emotion = Emotion-first group; Cognition = Cognition-first group.

Did the participants improve on a set of dependent measures after the treatment - flatness analysis?

In Table 2 one can see that all variables departed from the flatness hypothesis suggesting that there were changes across different time points, independently of the group effects (large effects). The profiles of these variables across time are presented in Figures 2-6, solid lines. Their means are given in Appendix B (rows titled Total $_{C+E}$).

The tests of flatness were followed by the t-tests with Bonferroni corrections (Appendix B), which suggested that from the pre-test to the post-test, the participants' scores on inflexibility and ruminations decreased (Cohen's d = 0.84 and Cohen's d = 0.91, respectively), whereas their scores on switching and updating increased (Cohen's d = 0.53 and Cohen's d = 0.48, respectively).

These changes remained at one-month and three-month follow-ups. On the other hand, the depression scores increased at the post-test (Cohen 's d = 1.78) and remained such at the follow-ups.

Table 2

Results of profile analyses for all dependent variables

	Flatness Within-subjects effects				Levels Between-subjects effects			Parallelism Main interaction effects			
	F(3,14)	p	Hott. T	η^2	F(1,16)	p	η^2	F(3,14)	p	W. Λ	η^2
Inflexibility	6.62	.01	1.42	.59	2.66	.12	.14	2.34	.33	.67	.33
Rumination	4.71	.02	1.01	.50	1.97	.18	.11	4.73	.02	.50	.50
Switching	7.55	.00	1.62	.62	0.03	.85	.00	0.17	.92	.97	.04
Updating	4.30	.02	0.92	.48	1.56	.23	.09	1.28	.41	.82	.18
Depression	14.94	.00	3.20	.76	6.64	.02	.29	1.40	.28	.77	.23

Did the two treatment groups differ in their overall levels of the dependent measures?

From Table 2 (Levels column) and Appendix B (column Total 1-4) one can see that the Cognition-first group had higher overall depression symptoms, averaging across the four measurement occasions, compared to the Emotion-first group (large effect). From Figure 6, it can also be seen that this difference was mainly due to an additional rise of the symptoms in the Cognition-first group after three months from the end of the program. There were no additional differences between the two groups.

Is there a different pattern of changes across four measurements between the two treatment groups?

The Time x Group interaction effect was significant only for ruminations (Table 2, parallelism column). As can be seen in Figure 3, there was a different

pattern of changes in ruminations over time between the two groups. The tests of simple main effects revealed that within the Emotion-first group, at one-month and three-month follow-ups there were significant drops in ruminations compared to pre-test (mean differences =27.5 for both comparisons, *SE* = 7.71 and *SE* = 7.95 respectively, 95% [*CI*]4.06-50.44, and [3.31-51.19], respectively, *p* = .02 for both comparisons; Cohen's *d* = 1.20). In the Cognition-first group, the levels of rumination remained stable across the four time points.

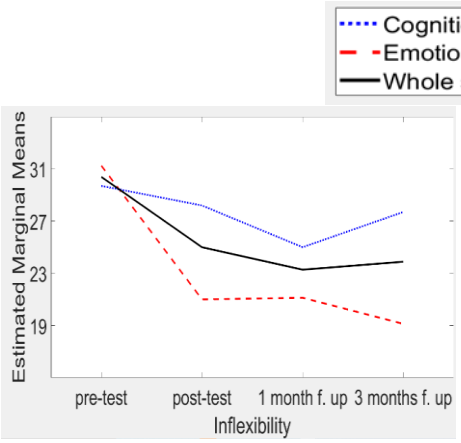

Figure 2. Inflexibility means at 4 time-points in groups with different order and in the whole sample.

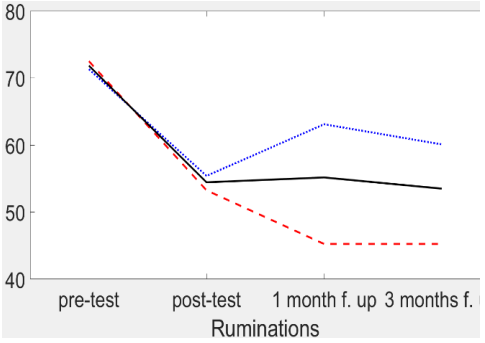

Figure 3. Rumination means at 4 time-points in groups with different order and in the whole sample.

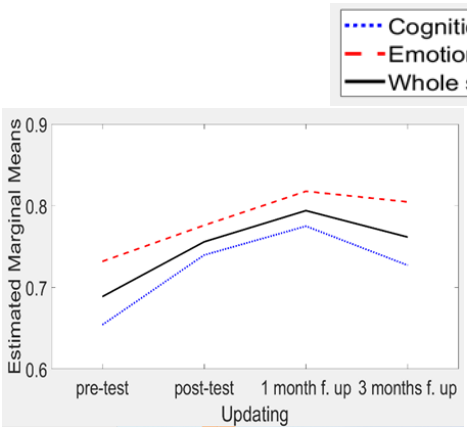

Figure 4. Updating means at 4 time-points in groups with different order and in the whole sample.

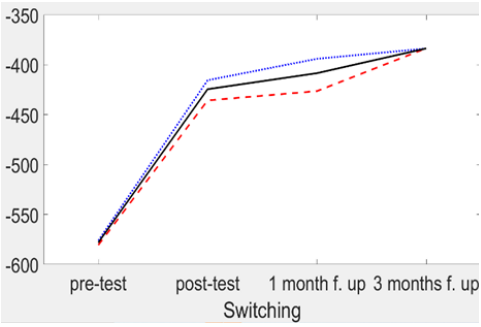

Figure 5. Switching means at 4 time-points in groups with different order and in the whole sample.

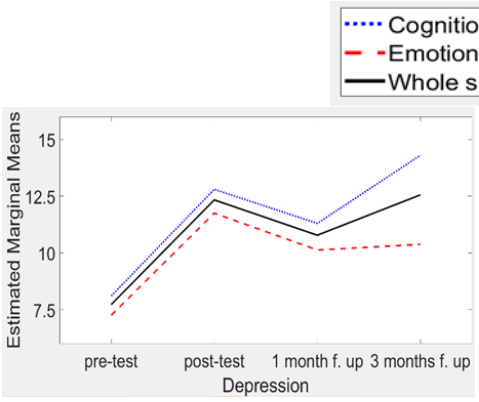

Figure 6. Depression means at 4 time-points in groups with different order and in the whole sample.

Discussion and conclusion

The aim of the present study was to test the efficacy of the novel self-help Attention Training (AT) program based on the acceptance/mindfulness principles. This program was created with an aim to help dysphoric students to improve their attention and to accept their unpleasant thoughts and emotions

in a non-judgmental way. We wanted to determine whether the program targets and changes basic components and processes considered to underlie mindfulness - psychological flexibility, rumination tendencies, and executive functions (e.g., Hölzel et al., 2011; Levin et al., 2012; Lutz et al. 2008; Malinowski, 2013). We also followed these processes one and three months after finishing AT.

The second goal of our study was to explore whether the order of different types of exercises mattered. Previous research suggested that directing attention to the body is an important introductory component of attention training (e.g., Verhaeghen, 2021; Hölzel et al., 2011), but we were interested in seeing what happens next while practicing emotional and cognitive exercises in a different order. In particular, we wanted to see if accepting emotions, as a first step, can help one to deal better with ruminations and to become less entangled in negative thinking. If, on the other hand, the reversed order would be more effective, one could argue that decentering, defusion, and other cognitive changes should take precedence over emotional regulation. Finally, we were interested in the sustainability of the changes three months after the end of the program.

Did the participants improve on a set of dependent measures after the treatment?

Regarding our first question about efficacy, overall, our participants over time demonstrated improvements on all dependent measures, with the exception of the depression symptoms. They became more psychologically flexible, less prone to ruminative thinking, and became more flexible in their attentional capacities over the course of the program. These positive changes were relatively stable showing that participants accepted the trained virtues of regulating their inner contents, thoughts, and emotions. The changes observed on psychological flexibility, ruminations, and attentional skills are in accordance with other research findings (Hayes et al., 2006; Jain et al., 2007; Verhaeghen, 2021), suggesting that practicing mindfulness-acceptance in a self-help form can increase acceptance, distancing from one's own biased thinking, and attentional

skills. There was a possibility that the improvement on attentional tasks, such as Navon's test, was a result of repeated testing rather than being a substantial effect of the exercises that were practiced in AT. Because we did not have a control group, we could not have excluded this possibility. On the other hand, we observed that the pattern of changes may allow for additional explanations. Namely, the largest change was between the pretest and posttest, which were one month apart. The scores from the two follow-ups were relatively unchanged compared to the second testing. One would expect greater improvements during the follow-ups due to practice.

What happened with the depression symptoms? These symptoms showed an increase over the course of the program and one and three months after the program as measured by the PHQ-9. Different explanations can be offered for this finding. One plausible explanation is that participants became better at accepting and regulating their moods, which resulted in easier and more honest reporting of inner states. According to the ACT theory, the reduction of symptoms is not the basic goal and necessary effect of the applied interventions, but the acceptance of one's sensations, emotions, and thoughts. It is possible that the increase in the symptoms is an expression of increased emotional acceptance and cognitive defusion instead of earlier emotional and cognitive control. Some unpleasant feelings or symptoms may be present (non-reduced), but their presence does not have a negative impact on general improvement (Hayes et al., 2004).

The data that are in line with this explanation were obtained during feedback from the participants. Namely, with only one exception, the participants stated that the program was a useful experience for them, and 83% expressed a desire to continue personal progress through an additional group training program that was offered to them in the end. These findings could reflect their openness to experience and acceptance, which includes even unpleasant emotions. For example, in one study with individuals with panic disorder, people who practiced acceptance, as opposed to suppression, demonstrated a greater acceptance of unpleasant panic sensations and greater

willingness to repeat the unpleasant situation of panic induction even though the level of their panic symptoms remained unchanged and high (Levitt et al., 2004). However, we can also speculate that some systematic factors, which were not controlled in this study, had influenced the mood of students, especially at two follow-ups which happened in the autumn (e.g., the beginning of the semester, exam deadlines, the end of summer, etc.).

In contrast to the results of the PHQ-9, all participants, except one, did not endorse that they felt more depressed when they were asked about their mood during debriefing sessions right after the program. This contradicting results from two self-reports about mood may be a consequence of the fact that some symptoms as measured by the PHQ-9 (e.g., problems with concentration, fatigue, sleep problems) could be an expression of students' lifestyle rather than depression symptoms (Novović et al., 2011; Janičić et al., 2019). Also, we should take into consideration the possible adverse effects of mindfulness. Namely, some authors previously reported mood worsening in some participants and have suggested that we need to identify those individuals at risk of experiencing adverse effects (Britton, 2019). In our study, we also had one reported case of mood worsening attributed to the mindfulness-acceptance exercises.

Overall, our preliminary findings seem to suggest that the components of AT training can have positive effects on the mindfulness-acceptance variables and process, however, a better understanding of its effect on depression is needed. Given inconsistent findings on two self-reports, future work on optimization of this training should consider additional components that would address even more emotional regulation. Also, more suitable instruments targeting negative mood in the student population are recommended as well as those tapping functionality, quality of life, and well-being.

Did the two treatment groups differ in their overall levels of the dependent measures?

The two examined groups, Emotion-first, and Cognition-first groups did not differ in their overall levels of psychological flexibility, ruminations, and

attentional capacities, but only in their levels of depression (Figures 2-6). The Cognition-first group, when considering all four measurement occasions, demonstrated larger depression scores. It is noteworthy that in this group the largest increase in the depressive symptoms was three months after the program, which is probably attributed to some external factors not related to the program. Unfortunately, we did not measure life events during and after the training, and also we did not have a control group which could have served as a baseline for comparison. Hence, future research, by addressing these limitations, will be in a better position to explore whether the observed changes in depressive symptoms in these types of programs result from a less avoidant attitude towards emotions, whether they are prerequisites of change, or are the results of life events unrelated to the self-help interventions. Even though the only significant difference between the two groups was on the measure of depression, one can see that the Emotion-first group performed better on all mindfulness/ acceptance measures. If we had a larger sample size, these differences could have become significant, and one could claim with more certainty that emotional regulation (acceptance of negative emotions) should precede cognitive interventions within the AT program intended for dysphoric students. Also, the finding that the Emotion-first group over treatment experienced greater decreases in ruminations compared to the Cognition-first group might explain lower depression symptoms in this group.

Is there a different pattern of changes across four measurements between the two treatment groups?

Finely, we revealed that there was a different pattern of changes at four time points in the Emotion-first and Cognition-first groups regarding ruminations. Although both profiles had a downward trend, only the Emotion-first group really benefited from the training, especially at follow-ups, achieving better improvement one and three months after the AT program. This result can be seen as an indication of different change patterns or pathways of improvement during AT. It seems that emotional change takes precedence: first

emotional acceptance, then cognitive change. Combined, our results suggest that practicing emotional regulation earlier in this treatment might have contributed to the development of greater acceptance and less entanglement with inner experiences through exposure and decreased reactivity to feelings. It seems that thought patterns (the process of cognitive defusion) are more susceptible to change if the barrier of emotional avoidance or emotional control is removed.

Limitations

The major limitations of this study were a lack of a control group, a small sample size, and unavailability of information regarding life events during the training and follow-ups. Also, it would be useful to have a more detailed record of daily practice which would include not only an overall estimate of daily practice but what specific exercise was practiced in a given time period. We did not have information about the amount of practice after the program ended. We recognize that one important factor in maintaining the effects of the program is the persistence of respondents in practicing the learned exercises, and it would be important to monitor how long and how often program participants continued to apply exercises after the program.

Strengths and directions for future research

This pilot study was the initial step in exploring AT as an efficient self-help intervention for dysphoric students. It provided us with an insight into how to optimize its delivery in terms of the order of interventions. One strength of our study was a very careful selection of participants using a structured clinical interview so that those with subthreshold depression symptoms could be detected and invited to participate. It is known that such symptoms often go unrecognized even though they can significantly affect the academic achievement and quality of life of students. Also, we ruled out the possibility that our findings were confounded by the effects of previous depressive episodes and other comorbid diagnoses (e.g., personality pathology, psychosis,

bipolar disorder). An additional strength of the study was the inclusion of one- and three-month follow-ups which allowed us to gain a more detailed insight into the maintenance of the achieved effects. We can also formulate recommendations for further research. For example, how lasting are the changes, and what factors contribute to their maintenance? The answer to this question requires longer monitoring of study participants with control of factors that could contribute to the permanence of the effects.

The next research question refers to the possibility of applying AT in other problem areas and difficulties that are important for the student population. In particular, can the program have positive effects on the reduction of anxiety, which, in addition to depression, is a frequent disruptive factor in students' academic achievement and life satisfaction? Is there a specific impact on worry, somatic anxiety and social anxiety? The effect of the program on some behavioral problems, such as procrastination and other patterns of avoidant behavior typical of the student population, can also be examined. The question is whether the pattern of change (emotional change first followed by cognitive change) that we found in this study can generalize to other problem areas. Future research should include and monitor not only the symptom reduction measures, but also measures of subjective well-being, positive affectivity, and general functionality. It is necessary to include control measures such as significant life events, where it would be important to examine their possible impact, but also whether the impact of adverse life events can be lessened through the application of exercises learned during AT.

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Conflict of Interests

We have no conflicts of interest to disclose.

Data availability statement

Data is available from the authors upon request.

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Appendix A

Table A1

Correlations among DVs at the pre-test

	1	2	3	4	5
1. Psychological flexibility					
2. Ruminations	.421				
3. Depression	.165	.454			
4. Updating	.046	-.243	-.285		
5. Switching	-.260	-.317	.102	.117	

Table A2

Correlations among DVs in the post-test

	1	2	3	4	5
1. Psychological flexibility					
2. Ruminations	.371				
3. Depression	.351	.461			
4. Updating	-.254	.068	.130		
5. Switching	-.238	-.054	.056	.038	

Table A3

Correlations among DVs in 1 month follow up

	1	2	3	4	5
1. Psychological flexibility					
2. Ruminations	.491*				
3. Depression	.280	.246			
4. Updating	.214	.021	.151		
5. Switching	-.546*	-.240	.132	-.014	

Note. * – Correlation is significant at the 0.05 level (2-tailed).

Table A4

Correlations among DVs in 1 month follow up

	1	2	3	4	5
1. Psychological flexibility					
2. Ruminations	.627**				
3. Depression	.689**	.424			
4. Updating	-.033	-.102	-.046		
5. Switching	-.375	-.292	-.098	-.003	

Note. ** – Correlation is significant at the 0.01 level (2-tailed).

Appendix B

Table B

Means, standard deviations, and pairwise comparisons of measurements at four time points

		Total and group Ms and SEs at 4 measurements					Pairwise comparisons with Bonferroni correction					
						Total	1-2		1-3		1-4	
		1	2	3	4	1-4	*t*	*p*	*t*	*p*	*t*	*p*
Inflexibility	$Total_{C+E}$	30.38	25.00	23.28	23.89		3.58	.01	4.72	.001	2.68	.10
		(8.41)	(7.88)	(7.11)	(8.50)							
	Cognition	29.70	28.20	25.00	27.70	27.65						
	first	(8.56)	8.43	7.51	8.94							
	Emotion	31.25	21.00	21.12	19.12	23.12						
	first	8.71	5.15	6.38	5.11							
Rumination	$Total_{C+E}$	71.83	54.44	55.17	53.50		2.92	.05	3.03	.04	3.33	.02
		(18.07)	(15.45)	(18.84)	(16.58)							
	Cognition	71.30	55.40	63.10	60.10	62.48						
	first	(18.81)	(12.59)	(15.47)	(11.68)							
	Emotion	72.50	53.25	45.25	45.25	54.06						
	first	(18.36)	(19.32)	(18.76)	(18.76)							
Switching	$Total_{C+E}$	-578.24	-424.53	-408.48	-383.66		3.83	.008	5.07	.001	3.87	.008
		(274.31)	(154.28)	(181.58)	(108.43)							
	Cognition	-576.23	-415.56	-394.09	-383.79	-442.41						
	first	(200.07)	(166.84)	(126.28)	(126.76)							
	Emotion	-580.76	-435.77	-426.46	-383.50	-456.62						
	first	(362.31)	(147.52)	(242.70)	(88.84)							
Updating	$Total_{C+E}$	.69	.76	.79	.76		1.91	.08	3.22	.005	1.92	.07
		(.11)	(.13)	(.12)	(.14)							
	Cognition	.65	.74	.77	.73	.72						
	first	(.12)	(.13)	(.13)	(.14)							
	Emotion	.73	.78	.82	.80	.78						
	first	(.09)	(.13)	(.12)	(.15)							
Depression	$Total_{C+E}$	7.72	12.33	10.78	12.56		5.48	.000	3.61	.01	5.23	.000
		(2.88)	(2.28)	(1.90)	(3.81)							

	Cognition	8.10	12.80	11.30	14.30	11.63
	first	(2.88)	(2.74)	(2.26)	(4.37)	
	Emotion	7.25	11.75	10.12	10.37	9.87
	first	(1.83)	(1.49)	(1.13)	(0.92)	

Notes. 1 – pretest, 2 – posttest, 3 – one month follow-up, 4 – three months follow up. $Total_{C+E}$ = means for both groups at each time separately; $Total_{1-4}$ = means of each group separately for all time measurements.

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Research Article

The effect of dispositional mindfulness on positive illusions in romantic relationships: dyadic approach

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ABSTRACT

Implicit beliefs and cognitions largely direct behavioral and emotional interaction between intimate partners which in turn determines relationship satisfaction of both partners. Positive illusions, based on automatic thinking, represent a possible strategy for coping with relationship stress caused by the discrepancy between ideal and perceived partner's attributes. Contrary, research suggests that mindfulness, a conscious alternative to functioning on automatic pilot, has numerous benefits on relationship satisfaction and partner dynamic. However, the role of mindfulness in the context of relationship cognition is still not fully researched. The aim of this research was to examine the relationship between dispositional mindfulness and positive illusions about intimate partners. Survey was conducted online, and it included participants living in Croatia. Dyadic analysis included 106 heterosexual couples (mean age for women was 23.17 years, and for men 24.54 years) who were in a relationship for at least 6 months. Mindfulness Attention Awareness Scale – MAAS is used as a measure of dispositional mindfulness, and Interpersonal Qualities Scale as a measure of partners' positive illusions. The actor and partner effects of dispositional mindfulness on illusory perception of partners' attributes were tested by Actor-Partner Interdependence Model. Contrary to hypothesized, mindfulness did not negatively affect biased perception of intimate partner. Partner effects for both men and women, and men's actor effect are shown to be significant in our model, suggesting that dispositional mindfulness contributed positively to partner's

illusory perception of their intimate partner attributes, on both dyad level and individual level only for men.

Key words: dispositional mindfulness, positive illusions, relationship cognition, dyadic approach

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Introduction

Romantic relationship cognition, a relatively new field of research interest, includes persons' thoughts and beliefs about their intimate partner and romantic relationship (Karremans et al., 2017). Same as when thinking about social world around us, relationship cognition is not black or white, and mostly always contains some level of cognitive bias. Brewer (1991; as cited in Leonardelli et al., 2010) described this type of cognitive bias as a persons' tendency to perceive their significant other in a more positive light, emphasizing their virtues, and diminishing their flaws. This type of positive perception is common for all partners throughout the relationship but is mostly prominent for couples at the early start of their intimate relationship. Social psychologists agree that automatic thinking of one of the most important intimate relationships in adult age largely shapes and directs emotional reactions and behavior of both partners, affects relationship stability (Fletcher & Kerr, 2010), and is reference point upon which partners assess their relationship satisfaction (McNulty et al., 2013). Fletcher et al. (2000) note that cognitive evaluation of partner's attributes opposed to ideal is an underlying process that directs relationship dynamic and is naturally happening throughout the relationship. Further research suggests that this type of evaluation happens at automatic level of processing (Overall et al., 2006), suggesting that underlying cognitive schemas and implicit beliefs greatly shape intimate relationships (Knee et al., 2015). Eventually, realizing partners' flaws and doubting their compatibility as a couple, partners' relationship satisfaction decreases (Keizer, 2014). However, the outcome – relationship stability versus ending, depends on how both partners cope with relationship stress (Barnes et al., 2007), that is, how they deal with this type of cognitive dissonance.

At this point, one might wonder to what degree partners willingly direct their relationship outcomes and do they even have necessary resources, both emotional and behavioral, needed to appropriately respond to possible relationship stress (Doss et al., 2005), as opposed to thinking and functioning on automatic pilot. Answer might be found in mindfulness, a state of awareness that emerges through paying attention to one's own thoughts, emotions, and sensations, and experiencing them non-judgmentally in a present moment (Kabat-Zinn, 2003). Mindfulness-

related research in the field of romantic relationships has become more popular, with researchers finding numerous benefits of this phenomena to relationship satisfaction (Karremans et al., 2017; Kozlowski, 2013), especially in the context of couples therapy (Carson et al., 2004; Doss et al., 2005). However, little is known of possible mindfulness effects on cognitive processes that underlie relationship dynamic. Relatively unexplored field of relationship cognition concerns possible mindfulness effects on automatic thinking that directs partner interaction, such as positive illusions. Furthermore, relationship cognition-mindfulness-focused research still lacks dyadic perspective that would provide broader insight of partners' interdependence and relationship dynamic.

Positive illusions

Positive illusions represent relatively permanent types of cognitive bias (Martz et al., 1998). The purpose of this biased perception is best understood through the analogy of defense mechanism. Stressful relationship events, such as perceiving partners' flaws and less desired behavior, often represent a threat to relationship stability. To maintain intimate relationships, and prevent possible negative outcomes, partners tend to mask negative aspects of their relationship, thus creating overly positive image of their significant other (Murray et al., 2003; Barelds & Dijkstra, 2011). This trend of positive polarization when evaluating intimate partner and relationship quality is becoming more prominent, and up to 80% of people tend to idealize their current intimate partner (Fowers et al., 2002).

Although often considered as negative and idealized perceptive bias (Murray at al., 1996b), researchers had found positive effects of positive illusions to numerous aspects of intimate relationship, such as supporting feelings of devotion and security (Barelds & Dijkstra, 2011). On a dyadic level, positive illusions of both actor and partner positively contribute to decrease of relationship conflict and promotion of relationship satisfaction (Furler at al., 2014; Murray et al., 1996a). Murray et al. (2003) suggests that, with time, dyad members show tendency to strive toward those qualities that their partner did, but they initially had not perceive in themselves. Thus, discrepancy between actors' perception of intimate partner, and partners' self-assessment decreases with relationship duration, suggesting that

partners strive for achieving a more positive self-image (Murray et al., 2003). Although considered a less optimal coping strategy with cognitive dissonance, positive illusions positively contribute to relationship satisfaction and insure long-term relationship stability (Karremans et al., 2017).

Dispositional mindfulness in romantic relationships

Mindfulness, in the context of relationship cognition, implies directing and focusing attention on thoughts and feelings that can directly or indirectly affect the stability of one's intimate relationship and can possibly disrupt partner dynamic (Karremans et al., 2017). Dispositional mindfulness positively predicts less anxiety and aggression directed behavior between partners after a conflict and is positively correlated with women's feelings of support and respect toward their partner (Barnes at al., 2007). Barnes et al. (2007) showed that male partners, whose female partners expressed higher levels of dispositional mindfulness, reported feeling less angry and hostile during relationship conflict, thus indicating possible interdependence model of mindfulness between partners, suggesting of mindfulness, being a possible protective factor of relationship stability (Wachs & Cordova, 2007). Direct and positive effects of dispositional mindfulness on relationship satisfaction, partner behavior and emotions that direct partner dynamic, are relatively stable and had been found in numerous research (Adair et al., 2018; Barnes et al., 2007). Theorists argue that underlying mindfulness processes allow us to respond to external stimuli more objectively and have more clarity about own internal processes (Brown & Ryan, 2003) which is in accordance with beneficial mindfulness effects to numerous relationship outcomes when facing relationship stress (Karremans et al., 2017).

However, positive illusions do not represent a threat to relationship stability, but rather promote partners' relationship satisfaction. Although seen as a negative coping strategy, positive illusions represent the part of automatic thinking continuum that positively contributes to relationship satisfaction (Furler et al., 2014). Contrary, mindfulness, being a more conscious aspect of own thoughts and emotional reactions, and possibly partner's negative attributes and behavior,

represents an opposite to automatic pilot (Karremans et al., 2017), and might redirect relationship dynamic.

Present study

Shifting research perspective from individual assessment to dyadic is especially important when exploring the field of partner dynamic and romantic relationship, while both partners' attributes and interaction are interdependent within dyad, suggesting that partners within dyad share more similar characteristics than they have with other people involved in romantic relationships (Kenny et al., 2006, as cited in Kaizer, 2014). While no known research has been done assessing mindfulness effects on positive illusions on the dyadic level of analysis, our study investigates possible mindfulness effects on partners' cognitive bias. The main objective is to examine whether, and in what direction, dispositional mindfulness contributes to persons' own positive illusions about their significant other (actor effect), as well as on the existence of partners' positive illusions (partner effect). It is hypothesized that dispositional level of women's mindfulness significantly negatively contributes to both positive illusions she holds about her own partner and partner's positive illusions. The same is hypothesized for men – higher dispositional level of men's mindfulness will decrease his own positive illusions, and positive illusions his female partner might hold about him.

Method

Sample

Participants from Croatia were recruited by snow-ball method, according to participation criteria that were following: minimum relationship duration of 6 months; not married and/or cohabiting and/or having children. Inclusion criteria were based on prior knowledge of romantic relationship dynamic (Miller et al., 2006; Murray et. al, 1996a) that differs significantly between married couples (with children) and cohabitating partners. Furthermore, minimum relationship duration criterion was set to include merely couples that, in the time, were in a more serious stage of their intimate relationship where initial infatuation had passed, and partners

were more familiar with each other's flaws and virtues. In total, 106 heterosexual couples, aged from 18 to 38 years, took part in the research. Mean age for women was 23.17 years (*SD* = 2.95) and for men 24.54 (*SD* = 3.28). Majority of women in our sample had bachelor's degree (49.1%), 25.5% had finished high-school, 24.5% had master's degree, and 1 female participant has finished elementary school. Most of men (36.8%) had finished high-school, 32.1% had bachelor's and 28.3% master's degree, 1.9% had finished postgraduate studies, and 1 male participant had finished only elementary school. The average length of the relationship was 3 years.

Procedure

Data were collected in January 2020 via online questionnaire, within a larger survey on romantic relationship cognition conducted for the purpose of the graduation thesis of one of the authors of this article. According to the internal procedures, research was approved by the expert council of the Department of Psychology at the Catholic University of Croatia. Prior to participation, each dyad member was given a 5-digit code (e.g., M2156 & Z2156), that allowed us to differentiate dyad partners by gender. Participants were informed of research aim, procedure, right to withdraw from participating and were assured that their answers would remain anonymous.

Measures

Dispositional mindfulness

Mindfulness Attention Awareness Scale – MAAS (Brown & Ryan, 2003) was used as a measure of dispositional mindfulness. On Likert type (*1 = almost always* to *6 = almost never*) 15-item scale participants had to assess to what degree they encounter these sensations and experiences (e.g., "*I find myself doing things without paying attention*"). All items are to be recoded, prior to calculating linear combination of all the items, so the overall higher result reflects higher dispositional mindfulness. Factor structure of Croatian version of MAAS is identical to the original unidimensional structure found by Brown & Ryan (2003), with Cronbach alpha coefficient (α = .85) indicating satisfactory scale reliability.

Positive illusions

Interpersonal Qualities Scale (Murray et al., 1996a) was used as a measure of partners' positive illusions. The original scale consists of 23 interpersonal attributes – virtues, flaws and socially acceptable attributes that are driven from the larger pool of interpersonal attributes (Murray et al., 1996a). For this research, original attributes were double blinded translated to Croatian and tested for their comprehensibility. Final version of *Croatian Interpersonal Qualities Scale* consisted of 21 positive attributes (e.g. kind, patient) and negative (e.g. lazy, impulsive) attributes. Participants had to rate how well these attributes described themselves and their partner on a 9-point scale (*1 = not at all characteristic to 9 = completely characteristic*). According to researchers in this field (Barelds & Dijkstra, 2011; Murray et al., 1996b) there are a few possible statistical calculations of positive illusions. However, residual score, that is believed to be a more reliable measure of positive illusions (Barelds & Dijkstra, 2011; Murray et al., 2003), was given priority over difference score. Thus, illusion of partners' attributes was formed as a residual score between participants' perception of partner characteristics (*actor perception*) and partners' self-assessment (*partner reality*) that are believed to be some level of objective benchmark. Residual score indicates that some amount of illusory perception exists when perceiving intimate partner, while partner does not perceive these qualities when thinking about self (Murray et al., 1996b). A positive score indicates existence of illusory perception, while negative result implies objective or even negative perception of partner in comparison to partners' self-assessment.

Socio-demographic variables

The questionnaire included demographic variables such as age, gender, duration, and nature of relationship. Along with questions regarding experience with meditation/mindfulness practice, participation criteria questions were also included.

Data analysis

Partner's characteristics and attributes can affect not only their own perception of intimate relationship but can also impact their partner's perception of the relationship. While most research on romantic relationships includes variables

and constructs that are characteristic for one specific relationship, and are rather interdependent for both dyad members, we can no longer validly measure partners' attributes as independent entities (Kenny & Cook, 1999). The most popular dyadic model – Actor-Partner Interdependence Model (APIM), enables us to statistically consider partners' non-independence and to determine not only how one's result on independent variable affects his/her own outcome (result in dependent variable), but also what effect one's result on the independent variable has on their partner's outcome. In other words, we can assess actor effect, which is shown using horizontal lines in the model, and partner effect which is represented by diagonal lines (Figure 1). In our model shown in Figure 1, predictor (independent variable) was dispositional mindfulness and curved arrow between men's and women's result allows partners' results to be correlated. Positive illusions were dependent variable. Circles marked with E and E' indicate that residual results covary between dyad members due to a cause that was not measured by the conducted research and point to the interdependence of dyad members. To test hypothesized relationships, we have used structural equation modeling (SEM) with maximum likelihood estimation in R (lavaan) program.

Results

Since preliminary analysis did not establish the existence of outliers (according to Mahalanobis distance), all the 106 dyads were included in dyadic analysis. Women and men showed about the same, relatively high level of dispositional mindfulness (Table 1). Descriptive results indicate that partners differ in how they perceive one another. While women tend to have positive illusions about men, men in our sample do not show the same for their partners. Therefore, in average, women perceive their partners more positively than their partners perceive themselves. However, men seem to have mostly negative perception about women, so they estimate their partner's attributes in a more negative light than she perceives herself.

Table 1

Means, standard deviations and intercorrelations in the APIM model

	M	*SD*	*Min*	*Max*	1	2	3	4
1. Dispositional mindfulness_W	4.01	0.75	2.00	5.33	1	-.043	.128	.240*
2. Positive illusions_W	- 0.19	0.54	1.21	1.47		1	.314**	-.155
3. Dispositional mindfulness_M	4.06	0.76	1.80	5.60			1	.252**
4. Positive illusions_M	-0.19	0.70	1.85	1.23				1

Notes. W – women; M – men. * $p < .05$; ** $p < .01$.

Dispositional mindfulness and positive illusions are positively correlated within dyad members. Positive correlation has been found between one partner's mindfulness and other partner's positive illusions, respectively for both partners. Effect between men's mindfulness and women's positive illusions suggests that the more mindful men are, their partners tend to perceive their attributes in a more positive, rather illusory light. The same effect has been shown for women - the more mindful women are, the more positive illusions men have about them. Accordingly, the same pattern is found on individual level, but only for men. The more mindful men were, more positively they perceived their partners.

Table 2

Unstandardized estimates of actor and partner effects in APIM model

	Effect	Estimate	*SE*	*p*
Dispositional mindfulness (M) – Positive illusions (M)	actor effect (M)	0.206*	0.084	.014
Dispositional mindfulness (W) - Positive illusions (W)	actor effect (W)	-0.062	0.067	.358
Dispositional mindfulness (W) - Positive illusions (M)	partner effect (M)	0.197*	0.077	.011
Dispositional mindfulness (M) - Positive illusions (W)	partner effect (W)	0.231**	0.063	.000

Notes. W – women; M – men. * $p < .05$; ** $p < .01$.

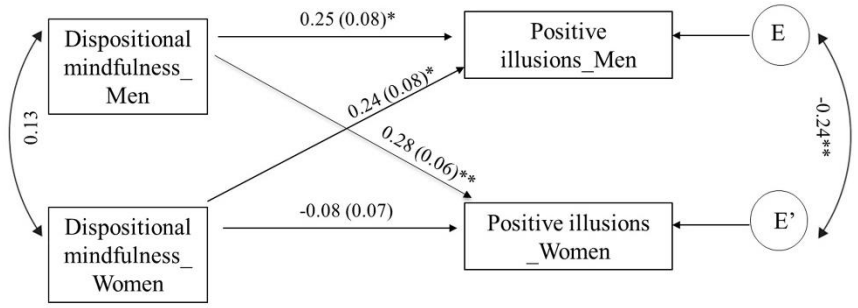

Figure 1. APIM model with standardized estimates

Actor-Partner Interdependence Model showed significant actor effect for men, suggesting that more mindful men have more positive illusions about their partner (Table 2 and Figure 1). Furthermore, both partner effects proved to be significant – men's mindfulness positively contributes to women's positive illusions and same pattern is true for women – the more mindful women are, the more positive illusions their partner has about them.

Dyadic patterns: parameter k

To statistically determine dyadic pattern in the results, Kenny and Ledermann (2010) suggest calculating parameter *k* which is ratio of partner and actor effect and should be calculated only when standardized actor effects in model are greater than .10 and are statistically significant (which is case in our model). In our model, *k* for the women equals -3.76, and for the men 0.95 (Stas et al., 2018). For the women, 95% percentile confidence interval ranges from -37.33 to 32.85. For men, confidence interval ranges from 0.12 and 4.46 (Stas et al., 2018).

Discussion

Differences in Positive illusions

Interestingly, our partners differentiate when thinking about their partner. While women have positive illusions about their partners, men perceive their partners more negatively, or one might argue even more objectively, in

comparison to partners' self-assessment (see Table 1). While residual score is calculated as difference between one's perception of their partner's attributes and partners' self-assessment on those same attributes, negative illusions that men have about women could be result of a more favorable women's self-assessment. Steenkamp et al. (2010) argue that women are more prone to give socially desirable responses on items that assess affiliation, belonging, intimacy, love, approval, and nurturance. Many personal attributes that our participants were asked to assess belong to that category. Paulhus and John (1998) called this tendency moralistic response and research consistently shows that women have higher moralistic response tendencies than men (Heine & Lehman, 1995; Lalwani, et al., 2006). These results indicate that, despite of men's tendencies to perceive their partners in a less positive, rather objective, light, our couples are prone to illusory perception of intimate partner characteristics that is believed to further relationship satisfaction (Miller et al., 2006; Murray et al., 1996a, 2003). While interpreting this result, it is important to remind that couples have been in romantic relationship for a longer period (3 years, on average). By that we can conclude that, women's tendencies to (overly) positively attribute intimate partner and perceive them through pink-colored glasses is preserving even in the mature stage of the relationship when knowledge of intimate partners' attributes and behavior is expected to be relatively objective (Miller et al., 2006). However, it seems that our women fall within that 80% statistic of people that overestimate their intimate partner and romantic relationship, which only supports previous findings (Murray et al., 1996a). This surely questions how well partners know one another, and if is justified to assume that illusory perception functions to promote feelings of security and commitment for possibly the most important intimate relationship that we achieve in adult age?

Actor and partner effects of dispositional mindfulness on positive illusions

On grounds of the assumption that mindfulness and positive illusions are based on opposite underlying cognitive processes, we hypothesized that dispositional mindfulness might shift partner perception from automatic pilot to

more conscious functioning, thus contributing more negatively to positive illusions. However, our results indicate the contrary. One's higher level of mindfulness seems to be positively correlated with other partner's illusory perception. Positive and significant partner effects of dispositional mindfulness to positive illusions indicate that women's mindfulness only supports overly illusory perception among men, and the same is true for men. Murray et al. (1996a; 1996b) state that this cognitive bias only further supports implicit belief of "blind love", by thus positively contributing to relationship satisfaction. This leads to questioning how truly intimate partners know each other, that is how prominent is this illusory effect of automatic thinking over our objective perception?

Based on interdependence theory, Kenny and Cook (1999) have established four different patterns that could be determined using dyadic analysis: only actor, only partner, couple pattern and social comparison, or contrast pattern (Kenny & Ledermann, 2010). The dyadic pattern is established based on 95% confidence interval of the parameter *k* that is calculated using bootstrapping method because of the non-normal distribution of parameter. In our model confidence interval for women is very wide and includes -1, 0 and 1, so we can't determine which dyadic pattern is most likely. For men, confidence interval includes 1, so we conclude that couple pattern fits these data the most. To be more precise, couple patterns occur when actor and partner effects are equal (a = p; k = 1), that is when on person's result on dependent variable (in our case, positive illusions), the same effect has their own as well as their partner's score on causal variable (dispositional mindfulness, in our model) (Kenny & Ledermann, 2010). Specifically, in our sample, men's dispositional mindfulness, and women's dispositional mindfulness both have equally significant positive effect on men's positive illusions.

It appears that cognitive schemas are relatively fixed and, working on automatic level of thinking, represent more prominent cognitive shortcuts opposed to mindful perceiving and directed attention. Thus, mindfulness in our participants did not negatively affect neither their own, nor partner's positive illusions. Another explanation of these findings lies within cognitive willpower that is needed for two opposed cognitive processes, where automatic thinking

develops on its own, while mindful awareness demands more focused and directed consciousness (Brown et al., 2007). Therefore, being mindful did not affect the persistence of cognitive bias of illusory perception, but is rather positively related to perceiving own partner in a more positive light. It might be argued that this underlying automatic thinking is relatively permanent due to partners' need to positively resolve cognitive dissonance that appears with low congruency of partners' current and believed attributes. Therefore, as Karremans et al. (2017) suggest, partners' first urge is to ensure relationship stability and are automatically motivated to do so. In context of the proposed assumption, mindfulness might even represent a risk factor to relationship stability among couples that have low emotional and coping resources (Doss & Christensen, 2006).

Even thought our hypothesis did not emerge to be true, results are in accordance with Boatright and McIntosh (2008) research that suggests positive correlation of mindfulness and positive illusions about self, indicating that, more mindful individuals are more likely to have overly positive perception. Explanation of these findings might also lie within the construct of mindfulness. While being mindful allows us to non-judgmentally observe experience and sensations in the present moment, it might be argued that processes beneficial to own well-being, in this context relationship stability and satisfaction, are beyond mindful awareness, or just beyond uncultivated mindful awareness. Theorists argue that underlying mindfulness processes allow us to respond to external stimuli more objectively (Brown & Ryan, 2003) which largely benefits in the context of threatening stimuli which positive illusions do not represent.

Contributions, limitations, and implications

The novelty of our study lies within the dyadic approach to assessing mindfulness and relationship cognition. This shift in methodology is still insufficiently embraced, but necessary for broader understanding of the field of relationship cognition and its role in partners' dynamic. Understanding relationship cognition and mindfulness mechanisms that could have significant effect on recognition of maladaptive behavior that threatens relationship quality

(Kappen et al., 2018; Karremans et al., 2017), provides knowledge for practical implications beneficial to practitioners that work with couples in troubled relationships who have little emotional and cognitive resources to deal with relationship stress. Due to auto selection, our participants were on average highly satisfied with their relationship, which limits our findings. Thus, it would be of great interest to include less satisfied and troubled couples when assessing mindfulness effects on relationship cognition, especially combining dyadic perspective with experimental approach. Furthermore, as the field of mindfulness research in the context of relationship cognition is expanding, some authors (Kimmes et al., 2018) differentiate relationship mindfulness from dispositional mindfulness and new aspects of assessing mindfulness are considered. While our research assessed only trait mindfulness that both partners bring in interaction, further research of these constructs and their relationship, especially seen from different methodological and theoretical perspectives, is welcomed.

More research on underlying mindfulness mechanisms and automatic thinking is needed. Thus, it would be interesting to examine a more comprehensive mediation model of mindfulness and positive illusions on relationship satisfaction, to investigate how two constructs affect relationship dynamic and whether they promote partners' satisfaction. Though our research only focused to investigate direct relationship between dispositional mindfulness and positive illusions, it might be interesting to research possible mediation models of two constructs with motivation to maintain the relationship and other emotional aspects that affect relationship satisfaction. Moreover, while dispositional levels of mindfulness did not have expected negative effects on illusory perception, it might be interesting to examine whether cultivated mindfulness might redirect partners' perception, especially considering possible partner effects. Finally, positive illusions represent one possible strategy for dealing with cognitive dissonance, with partner acceptance being the other. Consciousness of own emotional reactions when perceiving partner's flaws is in the basis of partner acceptance (Doss et al., 2005), indicating of possible similar mechanisms that underly mindfulness and even questioning

whether mindfulness might lie in greater partner acceptance. Thus, further investigating the interaction of these two constructs would be of great interest.

Conflict of interest

We have no known conflicts of interest to disclose.

Data availability statement

Available upon request. For further details on data contact the authors.

Authors Note

The sample presented in this research was used for the purpose of other analyses of relationship cognition.

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Research Article

The Mediation Role of Trait Mindfulness in the Relationship between Alexithymia and Alcohol Consumption

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ABSTRACT

Even though the relationship between alexithymia and alcohol consumption has been long established, little is known about the factors which may explain this association. The purpose of this study was to investigate trait mindfulness as the mediator of the association between alexithymia and alcohol use. The study was conducted online. A convenient sample was used in the study which consisted of 629 adult participants (243 males). Alexithymia, mindfulness, and, alcohol consumption were assessed with questionnaires. The results were analyzed with Proces macro. The results revealed a full mediation between alexithymia, trait mindfulness and, alcohol consumption. It was shown that high alexithymia via high trait mindfulness contributes to greater levels of alcohol use. The present findings are discussed in the light of mindfulness as a mechanism which guide adaptable and unadaptable tendencies which therefore, can control the consequences alexithymia has on alcohol use.

Keywords: alexithymia, mindfulness, alcohol consumption

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Introduction

Alcohol consumption represents one of the leading health problems. It is accountable for 7.10% of the diseases among males and 2.20% among females (World Health Organisation, 2022). The etiology of alcohol dependence is complex, emphasizing the interaction between biological, psychological, and sociological factors. Among biological factors genes, reward system, and changes in dopamine levels are commonly mentioned (Carvalho et al., 2019; Edenberg & Foroud, 2013; Koob &Volkow, 2016). Socioeconomic status, childhood trauma, or parents abusing alcohol are some of the environmental influences contributing to drinking (Haugland et al., 2021; Sudhinaraset et al., 2016; Zdankiewicz-Scigala & Scigala, 2018) while psychological factors include various personality traits such as high novelty seeking, impulsivity or trait mindfulness (Foulds et al., 2017; Nicola et al., 2014; Sala et al., 2019). Another personality trait most commonly mentioned in the context of alcohol consumption is alexithymia.

Alexithymia is described as the inability to identify, describe and communicate feelings as well as a difficulty in the differentiation of emotions (Messina et al., 2014; Sifneos, 1973). In the past, alexithymia has been commonly seen as a stable trait with a continuous distribution (Keefeer et al. 2019) while recent studies suggest it's levels can change during psychosocial interventions (Cameron et al., 2014). This difficulty in the differentiation of emotions, so-called granularity, is particularly pronounced in the range of negative emotions (Aaron et al., 2018). A person with low emotion granularity will define their own state as „not good" or "bad" while a person with high emotion granularity the same emotional state will label as „anxious" or „irritated". Moreover, alexithymic also presents difficulties in interpreting somatic sensations that accompany emotions. Some argue alexithymia is a deficit of interoceptive accuracy (Bird et al., 2010; Herbert et al., 2011) and is thought to be crucial for the correct identification of emotional states (Barrett, 2006; Herbert & Pollatos, 2012).

The relationship between alcohol consumption and alexithymia is widely confirmed. The prevalence of alexithymia among alcohol addicts ranges from

45–67% (Thorberg et al., 2011) while in the general population the prevalence is estimated to be around 10% (Hiirola et al., 2017). It has been shown that emotional deficits contribute not only to the development but also maintenance of alcohol abuse (Kopera et al., 2015). Recently abstinent and recovering alcoholics tend to have problems with facial expression recognition, especially with regards to negative emotions, and a tendency to overestimate the intensity of emotions (Philippot et al., 2006; Townshed & Duka, 2003). It has also been shown that alexithymic alcoholics experience more negative affect in comparison to non-alexithymic alcoholics, while no difference between these two groups was found regarding positive affect (Cox et al., 1998). Since alexithymic alcoholics have greater problems with negative emotions, it's been argued that this tendency is caused by the discomfort they tend to experience in social situations (Uzun et al., 2003). It is supposed that alexithymic susceptibility toward alcohol in social situations is aimed to reduce stress and improve their interpersonal interactions (Kauhanen et al 1992).

Literature attempts to explain the linked relationship between alexithymia and alcohol. According to some, the association between alexithymia and problematic drinking can be explained by negative affect but studies which controlled the effects of negative affect in the analyses still confirmed the relationship between these variables (de Timary et al., 2008). Others explain the link between alexithymia and alcohol with parental bonding and attachment style (Lyvers et al., 2019) or even with impulsivity (Herman et al., 2020). Conversely, no attempts have been made to explain this relationship with trait mindfulness considering there is a plethora of evidence on the association between alcohol consumption and mindfulness (e.g., Karyadi & Cyders, 2015; Sala et al., 2019) as well as alexithymia and mindfulness (e.g., Aaron et al., 2020; Norman et al., 2019). With regard to the alexithymia and mindfulness link, it was shown that this association is inverted. Different components of mindfulness negatively relate to alexithymia (Teixeira & Pereira, 2015). Also, mindfulness training contributes to increased emotional granularity (Van der Gucht et al., 2018) and improved interoceptive accuracy which results in decreased alexithymia over time (Edwards et al, 2018).

Trait mindfulness is defined as the ability to be aware and focused on present experiences in a nonjudgemental manner (Brown & Ryan, 2003). Distance from the experience, which a person creates by implementing mindfulness, allows one to observe the ever-changing nature of emotions and sensations accepting them as they are, not acting upon them. As an outcome, this nonjudgemental and non-reactive stance allows a person to break a cycle of unhealthy behaviors and initiate positive change (Ryan & Deci, 2000). According to studies, trait mindfulness is negatively associated with stress, neuroticism, anxiety trait, and state and depression while positively with positive affect, vitality, life satisfaction, and satisfaction of basic psychological needs (Brown & Ryan, 2003; de Sousa et al., 2021). Also, even though mindfulness was for a long time considered to have dispositional quality, recent studies demonstrate it can be developed over time with regular mindfulness meditation practice (Kiken et al., 2015).

Mindfulness has also been negatively related to addictive behaviors (Karyadi et al., 2014) by redirecting attention from maladaptive cognitions, such as cravings or ruminations, to a broader context making room for the positive assessment of the situation (Garland et al., 2015) which then initiates change for the better. With respect to alcohol consumption, mindfulness is invertedly related to alcohol abuse in student and clinical populations (Bowen & Enkema, 2014; Karyadi & Cyders, 2015). Specific facets of mindfulness, awareness and nonjudgmental acceptance, seem to have a particularly important role in shaping positive outcomes when alcohol use is concerned (Short et al., 2016; Stanley et al., 2019). Practicing awareness and acceptance makes a person embrace negative emotions which weakens mood-regulatory drinking motives (Roos et al., 2015) and prevents alcohol abuse. In general, the relationship between trait mindfulness and alcohol use is stronger for psychiatric than non-psychiatric populations due to the inability of the psychiatric population to distance themselves from negative thoughts, treating them non-judgementally (Sala et al., 2019).

On the other hand, there are also studies which have demonstrated that the effects of mindfulness on health-related behaviors may not always be

positive. Farias et al. (2020) found that adverse effect rates for mindfulness range between 4 and 33%. It is suggested that the increased awareness, which reflects the presence of high mindfulness, prompts the presence of heightened anxiety or full-blown panic attacks while practicing increased psychological distance from the experience may initiate affective blunting and dissociation (Britton, 2019). With respect to alcohol consumption, research suggests acting with awareness decreases alcohol consumption while nonjudgement increases it. (Carter, 2015). Also, mindful curiosity is linked to alcohol misuse which is due to fewer inhibitions associated with high levels of curiosity (Carter, 2015). According to some authors, Mindfulness forms an inverted U-shape relationship with other psychological constructs (Britton, 2019) explaining why too much of a good thing, in this case, mindfulness, can turn bad. It is commonly found that the negative effects of mindfulness are the most pronounced among those actively participating in intense mindfulness sessions. For example, Reangsing et al (2022) demonstrated that a greater number of mindfulness sessions in a week, rather than a few, resulted in greater depression among emerging adults. In the same fashion, Saltsman et al (2021) found that high mindfulness activates cardiovascular response typical of stress-relates states due to greater attention and cognitive processing given to this particular stressor in an attempt to overcome it.

Presently, not many attempts have been made to uncover the pathway through which alexithymia affects alcohol consumption. Since no one has tried to look into trait mindfulness within that role, especially if the mixed findings about its effects on alcohol consumption are taken into account, the aim of this study is to investigate whether trait mindfulness mediates the association between alexithymia and alcohol use. Based on the majority of earlier studies which associate mindfulness with health-related behaviors, it is expected that trait mindfulness is a mediator of the relationship between alexithymia and alcohol use. It is predicted that high alexithymia through low mindfulness contributes to high alcohol consumption.

Methods

Participants

The convenience sample was used. In total 639 participants took part in the study of which 10 were not yet 18 years of age so their data were omitted from the further analyses. Therefore, the results of 629 adult participants (243 males, 383 females, and 3 choosing „other") entered the final analyses. The age range was 18 to 80 with the average age being 31.43 (*SD* = 13.31). The age distribution of the current sample according to developmental stages suggested by Lally and Valentine-French (2019) was as follows: 51% of participants were in the emerging adulthood stage (18-25-year-olds), 22% were in the early adulthood stage (26-40-year-olds), 25% was in the middle adulthood stage (41-65-year-olds) and 2% belong to late adulthood stage (65 onwards). The sample consisted of 22 participants who had finished elementary school, 370 with finished secondary school, 93 with high school qualifications, and 144 who had a university degree and above. Socioeconomically, 7 participants were considered as having low status, 27 reported below-average status, 470 considered to be in the average range, 104 to be above average while 21 participants reported high socioeconomic status. Of all participants, 57 (9.10%) reported having some kind of mental health condition.

Measures

The sociodemographic questionnaire was used to collect data on age, gender, socioeconomic status, education, and mental health status of participants. The socioeconomic status was assessed by asking the respondents to choose the answer from the 5-point scale (1-low socioeconomic level to 5 high socioeconomic level) which best indicated their socioeconomic level. Participants' education is assessed by asking them to indicate their level of education by choosing one of the answers from a 4-point scale (1 - *elementary school* to 4 - *high education*). Mental health status was measured by asking participants if they suffer from any mental health illness which they indicated by choosing between Yes/No option. The information on parents' educational

background and problematic consumption of alcohol was collected too. Education level was assessed for each parent choosing answers from a 4-point scale (1-elementary school to 4-high school diplomas). Parents' problematic alcohol consumption was measured by asking participants to indicate if any parent has/or had problematic alcohol use which they answered by choosing between Yes/No options. If the Yes option was chosen, then they had to indicate which parent has/had such difficulties.

Toronto Alexithymia Scale (TAS-26; Bagby et al., 1986)

Alexithymia was measured with Toronto Alexithymia Scale (TAS-26; Bagby et al., 1986). This scale consisted of 26 items grouped into four subscales: a) difficulty to identify and distinguish between feelings and bodily sensations; b) difficulty to describe feelings; c) reduced daydreaming; and d) externally oriented thinking. The answers are given on a 5-point Likert scale (1 - *strongly disagree*, 5 - *strongly agree*). Results are calculated by adding together all the answers which a participant chose. The higher the results, the more profound alexithymic tendencies. The scale was already used in research on Croatian samples. This instrument was translated and validated by Kocijan Lovko, Gelo, and Karlovic (2015). The internal reliability of the scale in that study was .71. The reliability of the scale on the sample of this study is α= .73.

Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003)

Trait mindfulness was assessed with the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003). The scale assesses the capability to bring attention and awareness to what is happening at a particular moment. It has a total of 15 items on which participants are answering on a six-point scale (1 - *never*, 6 - *always*). The total score is calculated by summing all the answers and dividing them by the number of questions. Higher scores indicate the presence of higher dispositional mindfulness. This scale was translated and validated on a Croatian sample by Kalebic Jakupcevic (2014). The Cronbach alpha reported from that study was .89. The measured internal consistency of scale on the sample of this study is .88.

The level of alcohol consumption was measured with the Alcohol consumption scale from Alcohol Use Disorders Identification Test (Saunders et al., 1993). This scale consists of three items on which respondents answer choosing from a five-point scale (0 to 4). The composite score is obtained by summing across the items whereas higher scores indicate greater consumption of alcohol. This scale was already adapted and used on a Croatian language by Spehar (2009). In that study the internal consistency of the scale was .78. Cronbach alpha for this scale in the current study is .75.

Procedure

All procedures performed in the study were in accordance with the ethical standards of the Institutional Research Board of the Department of Psychology, Faculty of Humanities and Social Sciences, University of J. J. Strossmayer in Osijek, Croatia. The study was conducted online by advertising the study on social networks. As part of general instructions, participants were familiarized with aim of the study, that only those who are 18 years of age and above can take part in the study as well as being familiarized with their rights. The contacts of psychological services were available before and after the instruments in case questions on alcohol consumption were too disturbing for them. After general instruction, participants were asked to give their consent for taking part in the study by choosing the option „I agree".

Results

The descriptive statistics can be seen in Table 1.

Table 1

Descriptive data of the examined variables (N = 629)

Variable	*M*	*SD*	T_{min}	T_{max}	*Skewness*	*Kurtosis*
Alexithymia	78.74	11.07	26	130	.30	1,11
Mindfulness	48.90	12.75	15	90	.09	-.26
Alcohol consumption	3.59	2.47	0	12	.72	.33

Note. T_{min} - theoretical minimum; T_{max} - theoretical maximum.

The descriptive statistics reveal that participants reported the presence of moderate levels of alexithymia and mindfulness. The consumption of alcohol was reported to be pretty low among participants in the study which is not surprising considering that a non-clinical sample was used. The results also reveal that all three variables are positively skewed but visual inspection of the results (histogram) shows that the mindfulness result distribution was normal while the other two were positively skewed. The greatest skewness was observed with alcohol consumption, a result distribution which is common for measures of clinical phenomena obtained from non-clinical populations. The only negative kurtosis of data was obtained with mindfulness results while the other two distributions were positive. The correlations between research variables can be seen in Table 2.

Table 2

The correlations between examined variables (*N* = 629)

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Age											
Gender	-.06										
Socioeconomic status	-.00	-.00									
Education	.29**	.16**	.17*								
Education of father	-.21**	.01	.14**	.15**							
Education of mother	-.36**	-.02	.10*	.05	.57**						
Mental health	-.01	.02	-.01	.01	-.01	-.03					
Alcohol consumption of parents	-.17**	.00	-.02	-.01	.12***	.14**	.07				
Alexythimia	-.19**	.02	-.09*	-.19**	.01	.09*	-.10*	-.07			
Mindfulness	-.17**	.06	-.12**	-.12**	-.00	.04	-.13**	-.12**	.61**		
Alcohol consumption	-.20**	-.25**	.06	-.07	.13**	.16**	-.01	-.06	.17**	.19**	

Note. *p < .05, **p < .01; gender: 1 - male/ 2 – female.

Age correlated with alexithymia, mindfulness, and alcohol consumption. Older participants had lower levels of alexithymia, mindfulness, and alcohol consumption. Gender was negatively associated with the consumption of alcohol indicating male-to-female drinking prevalence. Both socioeconomic status and education negatively correlated with alexithymia and mindfulness in a way that participants with lower socioeconomic status and less education experienced greater alexithymia and mindfulness. Mental health status negatively correlated with alexithymia and mindfulness indicating that having pre-existing mental health condition is associated with more profound alexithymia and mindfulness.

Alexithymia is highly positively associated with mindfulness and weakly positively with alcohol consumption. This indicates that the greater the alexithymia, the higher mindfulness and consumption of alcohol. Finally, mindfulness was weakly positively related to alcohol consumption indicating that people with greater mindfulness had higher levels of alcohol intake.

In order to test the mediation role of mindfulness on the relationship between alexithymia and alcohol consumption, SPSS Process Macro (Hayes, 2013) was used. The number of bootstrap samples for calculating confidence intervals was 5000. The obtained results can be seen in Figure 1.

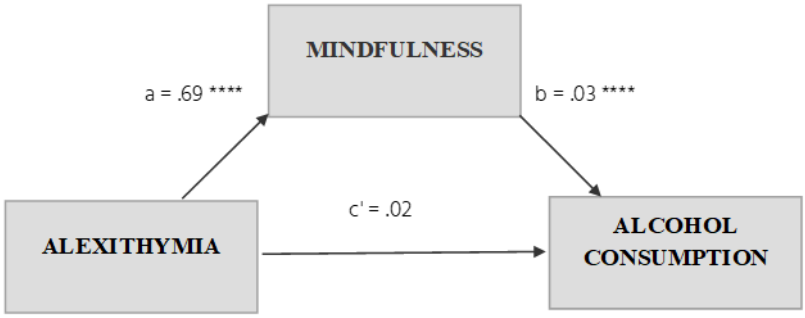

Figure 1. The mediation effects of mindfulness on the relationship between alexithymia and alcohol consumption

As Figure 1 shows full mediation occurred. That is, the indirect contribution of alexithymia to alcohol intake entirely takes place through mindfulness (*b* = .02, *BootstrapCI95* = .006 – .031). High alexithymia through high mindfulness contributes to high alcohol use.

Bearing in mind that pre-existing mental health conditions could affect tested relationships (Sala et al., 2019) the mediator role of trait mindfulness on the association between alexithymia and alcohol consumption was also tested whilst controlling the effects of mental health condition status. The results of this analysis also confirm mindfulness as the full mediator of the relationship between alexithymia and alcohol use (*b* = .02, *BootstrapCI95* = .006 – .030).

Discussion

Using available literature on the relationship between alexithymia and alcohol consumption on one hand, and the positive effects of trait mindfulness on human functioning on the other, the current work investigated if trait mindfulness mediates the association between alexithymia and level of alcohol consumption. The hypothesis that trait mindfulness mediates the relationship between alexithymia and alcohol consumption was confirmed. Considering numerous studies demonstrated the positive effects of mindfulness on health-related behaviors, it was expected that low alexithymia would, through high mindfulness, initiate low levels of alcohol consumption. Surprisingly, this assumption was not confirmed. It was shown that high alexithymia via high mindfulness contributes to higher alcohol consumption.

The findings highlight several important points. Firstly, heightened attention and awareness of emotional experiences rising from high mindfulness, create a context where those experiences are not observed from the distance but rather submerge a person completely into them. Secondly, for these reasons such experiences are most likely falsely negatively interpreted which most likely perpetuates high anxiety that makes alexithymic's, who poorly deal with social stressors (Uzun et al., 2003), resort to excessive drinking as means of coping with the given circumstances. Therefore, high trait mindfulness amplifies the already existing negative effects of alexithymia on alcohol consumption. Finally, these

effects of high mindfulness may not be a problem for „healthy" individuals but it is an issue for the vulnerable, those who struggle with emotional experiences, or those who are prone to negative interpretations of feelings as a result of already existing mental conditions. The following information confirms these claims.

Mindfulness Attention Awareness Scale (Brown &Ryan, 2003), which was used in this research, is comprised of items that are mainly oriented at measuring awareness. This means that in the current study mindfulness was mainly evaluated through this dimension. Now, even though high awareness has many benefits (Brown & Ryan, 2003) for meditators who are working to develop this quality, it is reported that heightened awareness also produces harmful consequences. The negative consequences of practicing high awareness reported by meditation practitioners are profound symptoms of anxiety, sadness, and trauma-related memories (Cebolla et al., 2017; Lomas et al., 2015).

In addition, some authors argue that mindfulness, like some other positive traits, is non-monotonic meaning it has its optimal level which initiates positive change but above and below negative effects exist. Since it was shown that greater levels of mindfulness contribute to the low intensity of emotions, emotional numbing, and dissociation (Cebolla et al., 2017; Lindahl et al., 2017; Taylor et al., 2011) it would not be surprising that for these reasons higher mindfulness contributed to greater alcohol consumption. After all, higher mindfulness has been shown to activate physiological responses typical of high-stress states (Saltzman et al., 2021) and initiate the presence of depression among those who practice mindfulness intensively (Reangsing et al., 2022).

Support for given claims is also drawn from research findings regarding characteristics of alexithymia. It was shown that people with alexithymia have susceptibility toward low granularity of negative emotions (Aaron et al., 2018) that is, failing to make fine differentiation between different negative emotions. For example, alexithymic confronted with a stressor will interpret their own feelings as „negative" rather than „irritated" or „angry". This feature of alexithymia, on its own, may not represent a problem if it were not for the magnifying properties of high mindfulness which accentuates the feeling of a generally present negative mood. Thus, for an individual with such a constellation of

personality traits, confrontation with stressors initiates a cycle of catastrophizing thoughts and the usage of coping strategies, such as problematic alcohol use, which should alleviate the generally present negative mood.

Further, the tested relationships are examined on a sample whose majority consists of emerging adults. With this in mind, it is likely that the given associations were established due to a large subsample of emerging adults participating in this study. Because of limited personal resources whilst facing transitioning from adolescence to adulthood these individuals face a greater number of life stressors which makes them more prone to mental health problems in comparison to individuals from other age groups (Arnett, 2000; Marchica et al, 2019). So, all point to the conclusion that the negative effects of high mindfulness may be more observable among those who are psychologically vulnerable in comparison to those who are well-adapted.

Similarly, mindfulness shares some characteristics with other psychological phenomena, such as introspection (Chambers et al, 2009) or neuroticism-related analyses of bodily sensations, feelings, and experiences which are then interpreted negatively. We can't be sure if this study's answers on mindfulness measure truly reflect mindful tendencies or features of some other phenomena which contributed to the presence of negative relationships between variables.

The fact that the adverse effects of mindfulness on the tested relationship are established on a random sample rather than a population with pre-existing psychiatric conditions confirms naturally occurring individual differences in mindfulness. In the past, the adverse effects of mindfulness were mainly reported by those who already had a tendency toward negative emotional experiences or who are in rigorous mindfulness training. Pauly et al. (2022) reported that meditators who had a pre-existing inclination toward negative thinking (i.e. poorer mental health) were the ones who reported those negative experiences. However, the authors also demonstrated when the effects of mental health status were controlled in the analysis, no association between negative thinking and adverse mindfulness effects was found. Considering that in this study the negative effects of mindfulness were evident even after

controlling for the mental status of participants suggests that the unpleasant effects of trait mindfulness are naturally occurring and are widespread in the general population.

Overall, this study suggests that mindfulness sometimes may not be bound by positive outcomes. According to the findings, it seems that the unwanted effects of mindfulness may be expected among groups that are susceptible to excessive alcohol consumption, as well as those who are having difficulty to adequately deal with emotions (e.g. those with high trauma exposure) or interpretations of internal experiences, for example, those who are mental disadvantaged (e.g. those with body dysmorphic disorder) or those prone to high-stress reactivity due to age-related limitations (e.g. emerging adults). For this reason, trait mindfulness could be assessed as part of the standard psychodiagnostic procedure in order to gain insight into the extent to which trait mindfulness complicates the clinical picture of those with pre-existing clinical diagnoses. Also, the findings remind us that mindfulness-fueled interventions should be individually tailored where the intensity or frequency of mindfulness practice should accommodate the patient characteristics in order to achieve optimal results. For this reason, studies like this are needed to gain insight into the all-around effects of trait mindfulness as well as to recognize individuals which may be particularly vulnerable to the adverse effects of this trait rather than just promising quick positive change for those who are trying to initiate their own development.

Some limitations need to be taken into consideration when interpreting the results of this study. Taking into consideration an indirect mediation effect confidence interval suggests a significant but weak indirect mediation effect which suggests that such findings should attempt to be replicated once more. Because of the cross-sectional nature of the study, no conclusions about causality can be drawn. In order to control the effects of pre-existing mental status on the results, mental health status was controlled in the analysis. However, we can't know if the results of participants with sub-clinical symptoms of depression or anxiety affected the data. Future studies should control these variables more rigorously. This study used the Mindfulness Attention Awareness

Scale (Brown &Ryan, 2003) which may not have the best capture of the full effects of mindfulness since it is primarily oriented toward measuring the awareness facet. Maybe the use of an instrument which, besides awareness, assesses other facts of mindfulness (e.g. Five Facet Mindfulness Questionnaire) may yield different results. Some studies indicate that different facets of mindfulness are related to different aspects of alcohol use behaviors (e.g. Fernandez et al., 2010) so it would be useful to assess the indirect effects of mindfulness facets on the tested relationship to gain a fuller understanding of established effects. Furthermore, even though the negative effects of high mindfulness were detected among those prone to greater alcohol consumption, the findings can not be generalized to other substance use behaviors. Literature suggests that trait mindfulness is more related to alcohol and tobacco use in comparison to marijuana consumption (Robinson et al, 2008) so it would be interesting to test the effects of trait mindfulness on the relationship between alexithymia and other substance use behaviors to see if findings would be replicated. Finally, the choice of an instrument with which alcohol use was assessed may not be the best as it did not cover other alcohol-related behaviors (e.g. duration of alcohol use, or alcohol-related symptoms) which may more objectively reflect the problematic consumption of alcohol among participants.

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Conflict of interest

We have no conflicts of interest to disclose.

Data availability statement

The data that support the findings of this study are available on request from the author.

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