

# Applications of mindfulness in psychiatry

## *Zastosowania mindfulness w psychiatrii*

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### KEYWORDS:

- mindfulness
- psychiatry
- depressive disorders
- anxiety disorders
- treatment

### ABSTRACT

Mindfulness-Based Therapies (MBT) are more and more frequently used in the treatment of mental disorders. In the paper the efficacy of meditation programs in the treatment of a variety of mental health problems in diverse adult and adolescent populations and psychological and neurobiological mechanisms underlying these effects were analysed. Intervention studies data supports the efficacy of mindfulness interventions in the treatment of depression, anxiety and addictive disorders. It is proved that mindfulness interventions affect emotion regulation, attention regulation, body awareness and perspective of the self. The effect of mindfulness based interventions in the treatment of mental disorders is supported by scientific rationale of its mechanism of action, and the treatment efficacy data is promising. However, further verification of mindfulness interventions efficacy through a greater number prospective, randomized, controlled clinical research trials is required.

### SŁOWA KLUCZOWE:

- mindfulness
- psychiatria
- zaburzenia depresyjne
- zaburzenia lękowe
- leczenie

### STRESZCZENIE

Terapie oparte na mindfulness są coraz częściej wykorzystywane w leczeniu zaburzeń psychicznych. W pracy poddano analizie dane na temat skuteczności programów opartych na medytacji w leczeniu problemów zdrowia psychicznego w populacji osób dorosłych i adolescentów, a także mechanizmów psychologicznych i neurobiologicznych leżących u podłoża tych efektów. Dane z badań interwencyjnych wskazują na skuteczność terapii mindfulness w leczeniu depresji, zaburzeń lękowych oraz uzależnień. Udowodniono, że interwencje oparte na uważności mindfulness pozytywnie wpływają na regulację emocji, uwagi, świadomość ciała oraz perspektywę na Ja. Działanie terapii opartych na mindfulness w leczeniu zaburzeń psychicznych jest poparte przesłankami naukowymi na temat mechanizmu działania, a dane odnośnie efektów leczenia są obiecujące. Wskazana jest weryfikacja skuteczności interwencji mindfulness w większej liczbie prospektywnych, randomizowanych, kontrolowanych badaniach klinicznych.

### Introduction

Mindfulness is defined as the ability to pay attention moment by moment, intentionally and with compassion and curiosity (1). Mindfulness has its roots in Buddhist tradition and has been practiced for over 2500 years. In the late 20<sup>th</sup> century, these practices were incorporated into Western World by Jon Kabat-Zinn, who set up a clinic in Massachusetts in order to treat chronic pain and stress. He introduced secular, mindfulness meditation practices and developed an 8-week program for people suffering from chronic pain (2). The program has been named mindfulness-based stress reduction (MBSR) and has been found to be helpful, among others, in the treatment of anxiety disorders (after 3-years follow up measure; reductions in Hamilton and Beck Anxiety and Depression scores) (3), psoriasis (rate of skin clearing accelerated after meditating during UVB and PUVA treatment) (4) and fibromyalgia (reduction in pain, depression scores and disability) (5).

In 1992, three UK researchers, Zindel Segal, Mark Williams and John Teasdale developed a new, cost-effective, psychosocial program that could prevent episodes

of depression for those who have recovered (6). Initially they intended to include few exercises of mindfulness practice into the cognitive-behavioral program, but ended up developing full mindfulness course with only few elements of cognitive-behavioral therapy (CBT). The program was named mindfulness-based cognitive therapy (MBCT) and introduced mindfulness practices to psychiatry. A number of randomized controlled trials proved that after MBCT course the relapse rate among those with three or more episodes of depression reduced by half (7).

Currently, cultivating mindfulness is an important part of third-way cognitive-behavioral therapy (CBT) and implemented as monotherapy, component of other treatment modalities, e.g., dialectic-behavioral therapy (DBT) used in the treatment of borderline personality disorder (8). Mindfulness techniques are also used in various psychotherapy modalities (9), forming mindfulness-based interventions (MBIs) (10). Mindfulness serves as a base for the treatment of various psychiatric disorders, e.g., mindfulness-based eating awareness training for people with binge-eating disorder (11) and mindfulness-based relapse prevention for substance abusers (12, 13).

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## Core mindfulness trainings

The central element of both MBSR and MBCT is development of mindfulness. It is done by various practices which concentrate on bringing the attention to the body as a whole, then focusing on the breath and then becoming aware of one's emotions, thoughts, sounds, body sensations and then, after the meditation – without judgment, critic, and bringing attention back to the breath and body as a whole (14). MBSR and MBCT were developed as secular, group-based intervention programs. They are both led by a professional, called MBSR/MBCT teacher, a qualified person certified by an accredited organization<sup>1</sup>. Both programs involve eight consecutive weekly, 2.5 hour group sessions that consist of approximately 12 people. Additionally, all participants are required to attend one full day silent retreat, named "Day of Mindfulness" (15, 16). Participants are expected to practice formal meditation 6 days a week for approximately 45 minutes as well as practice informal mindfulness exercises for approximately 20 minutes, each day. Formal meditation practices include "body scan" (that teaches participants to mindfully pay attention to all body sensations starting with the toes/feet and slowly moving to face/head), "sitting meditation" (that teaches individuals to focus on body sensations, emotions, thoughts and sounds with inviting, accepting, friendly and non-judgmental attitude to whatever arises in awareness) and "mindful yoga" (that teaches body awareness and helps accept the reality that is in the present) (17). All formal meditations are part of homework together with informal practice such as "mindful eating", "mindful walking", "mindful dishwashing", "mindful cleaning" etc. (18).

The importance of mindfulness has been recognized by various psychiatry professionals and included in educational programs. Among many, The Specialty Committee in Psychiatry of the Royal College of Physicians and Surgeons of Canada, The Association of Medical Faculties of Canada, University of Oxford in UK, University of Rochester School of Medicine and Dentistry in USA, Jefferson Medical College Mindfulness Institute in USA, Jefferson – Myrna Brind Center of Integrative Medicine Philadelphia, PA in USA Monash University in Australia have introduced obligatory introductory mindfulness training for their students and practicing psychiatrists (19, 20, 21).

There is a strong emphasis that both MBSR and MBCT, as well as other MBI (certified), teachers have an ongoing and well-grounded mindfulness meditation practice in order to best demonstrate the core qualities of mindfulness (22, 23, 24).

The aim of this paper is to introduce the overview of neurobiological and psychological mechanisms underlying the effects of mindfulness based interventions and present data on efficacy of mindfulness-based interventions in anxiety disorders and stress reduction, depressive disorder, as well as influence on attention capacity in diverse adult clinical populations.

## Method

A narrative review was performed based on relevant literature identified from the following databases: MEDLINE, NCBI, PsycINFO and ResearchGate. Search terms included: "mindfulness and psychiatric disorders", "mindfulness and depression", "mindfulness and anxiety", "mindfulness and adolescents

psychiatry", "mindfulness and psychology", "mindfulness and neuroimaging", "neurobiological and mindfulness".

## Results

More than 17000 original and review papers published between 1980 and 2020 appeared in response to the search terms provided in selected databases. 59 papers were identified as pertinent for the purpose of the review and analyzed. Inclusion criteria were: designs with Randomized Control Trials; MBSR or MBCT program evaluation, studies included a reliable and valid outcome measure of depression or anxiety; meta-analysis and systematic reviews of mindfulness programs, meta-analysis of neuroimaging research, meta-analysis of psychological effects of mindfulness practice.

## Neurobiological mechanisms

Over the past 15 years, numerous studies in neuroimaging have been conducted to examine changes in brain morphology related with mindfulness meditation. Fox et al. performed a meta-analysis of 21 neuroimaging studies examining 300 meditation practitioners and found 123 brain morphology changes resulting from mindfulness meditation (25). According to the study, eight brain regions are consistently changed in those who were experienced in meditation: rostralateral prefrontal cortex (responsible for meta-awareness, processing of complex, abstract information and introspection), sensory and insular cortex (tactile information, e.g., touch, pain, body awareness and conscious proprioception), hippocampus (memory consolidation and facilitating emotional responses), anterior cingulate cortex and mid-cingulate cortex (mediating self-control, regulation of emotions, attention), superior longitudinal fasciculus and corpus callosum (tracts of white matter). Several consistent changes were observed: changes in brain density, increase in the number of neurons and fibers, changes in thickness of brain tissue.

Up until now numerous research has been conducted to examine whether MBSR (stress reduction program) impacts amygdala, a region of brain responsible for emotional processes and associated with so called "fight or flight" reaction. It was proved in several studies (26, 27, 28) that in this region there is a decrease of grey matter density following the participation in a mindfulness program, moreover, right amygdala activity decreases during negative emotion processing. These findings are regarded as potential mechanism explaining the influence of mindfulness practice on stress management. There is an increasing attention in neuroimaging research to examine the effects of meditation on specific brain function. fMRI studies have shown frontal brain activity increase, especially dorsolateral and medial prefrontal cortices (29). With long-term mindfulness meditation the grey matter and activity in the amygdala reduce, which influence and increase physiological calmness and well-being. The investigators report that changes in amygdala (decrease in brain cell volume as well as increase of functional connections between the amygdala and the prefrontal cortex strengthen) can buffer against post-traumatic stress response (30, 31, 32), anxiety and depression (33, 34, 35). Atkinson (36) analyzed seventeen studies in order to explain the impact of mindfulness on relationship satisfaction. The analysis proved changes

<sup>1</sup> In Poland, there are two accredited organization that provide: a) MBSR Teachers Training, according to Jon Kabat-Zinn's program – Polski Instytut Mindfulness together with Institute of Mindfulness Based Approaches in Germany, b) MBCT Teachers Training – Fundacja Rozwoju Mindfulness together with Oxford Mindfulness Center.

in ACC (anterior cingulate cortex) activity levels, greater cortical thickness in the dorsal ACC and increase in white matter integrity. ACC *mediates attention* what is considered to be one of the most important features of emotional intelligence, *regulates emotions* by increasing of parasympathetic tone and decreasing of sympathetic activity, what results in decrease of blood pressure, cortisol levels and muscle tensions lower oxygen and carbon dioxide consumption. The activation of body alarm response has been associated with relationship satisfaction and research has shown that the higher the diffuse physiological arousal (DPA) is, the marital happiness declines (37). Moreover, mindfulness practice promotes the recruitment of non evaluative sensory pathways involving the thalamus, insula, and primary sensory regions. It was shown that mindfulness meditation mediated empathy and experience sharing along with increasing insula and ACC activity, which are thought to be the key parts of a brain resonance circuit, that enable a person to align his/her internal states with those of another person (38).

### Psychological mechanisms

Although many empirical studies have confirmed beneficial effects of regular mindfulness meditation on mental health, very little is known so far about the psychological mechanisms underlying these effects. However, it is worth to stress that mindfulness construct is understood and studied as a state, which is conceptualized as a momentary condition and a trait, which is a stable characteristic of a personality that can vary within individuals across time. There is also mindfulness as practice that refers to a concrete mindfulness meditation practice. State mindfulness can be developed by i.e., MBSR or MBCT programs. Trait or dispositional mindfulness is the capacity and ability of paying and maintaining attention to present-moment experiences with an open and nonjudgmental attitude (39).

Yela et al. (40) analyzed data from over 800 adults comparing these who were practicing meditation with those who were not. The researchers investigated the duration and frequency of mindfulness practice and assessed mental health primarily considering symptoms of anxiety and depression. They identified three main factors associated with mental health benefits of mindfulness practices: self-compassion (viewing challenges as human experiences and taking an attitude of kindness toward one's self), presence of meaning in life (seeing valuable and important things in life and valuable objectives to pursue, reduction of experiential avoidance (that describes an individual's unwillingness to experience and accept difficult inner thoughts or feelings and ability to "stay with" negative thoughts and emotions). The researchers distinguished the "occasional" and "regular meditators" and based on the homework assessment proved the higher frequency of practice plays a crucial role in observing beneficial effects.

This partly corresponds with Shapiro's model describing mechanisms of the influence of mindfulness interventions on health-related outcomes (41). According to this model, mindfulness meditation effects can be explained by the construct of *reperceiving*, which is a meta-mechanism responsible for mobilizing four additional proximal mechanisms associated with positive health outcomes. Those are values clarification, exposure, self-regulation, and cognitive/behavioral flexibility. Values clarification involves identifying one's important personal values, which are expected to increase the meaning of life and values-consistent behavior. Exposure refers to the ability to "stay with" negative emotional states. Self-regulation refers to the ability to monitor and adapt one's emotions and behavior. Cognitive/behavioral flexibility is the ability to process important available information and produce appropriate and adaptive behavioral responses (42).

Brown et al. (43) indicated various processes underlying the psychological mechanisms of mindfulness and therapeutic effects, including: decentering, enhanced body-mind functioning, behaving in a more purposeful ways, non attachment to feelings and thoughts. Vago and Silbersweig's (44) psychological and neurobiological model of mechanisms through which mindfulness influences mental health describes three elements:

- 1) self-awareness,
- 2) self-regulation, and
- 3) self-transcendence which is conceptualized as "self-other connection".

Coffey et al. conducted a study with 399 individuals (45), in which they distinguished four factors influencing emotion regulation: "present-centered attention", "acceptance of experience", "clarity about one's internal experience", and the "ability to cope with unpleasant emotions". Both "present-centered attention" and "acceptance of experience", through clarity about one's own experience, improves the ability to deal with unpleasant moment and emotions. The clarity about experience also negatively correlated to rumination and psychological distress.

### Neuroimaging research

Holzel et al. described four psychological mechanisms how mindfulness work: attention regulation, body awareness, emotional regulation (including reappraisal, exposure, extinction, reconsolidation) and change of a perspective on the self (46). Each of them is associated with different area of the brain that could be observed in neuroimaging research: anterior cingulate cortex; insula, temporoparietal junction; (dorsal) prefrontal cortex, ventro-medial PFC, hippocampus, amygdala; medial PFC, posterior cingulate cortex, insula, temporoparietal junction. All components facilitate each other representing self-regulation process and upward spiral process. Key components are presented in Table 1.

**Table 1. Explanatory model for mindfulness – psychological mechanism and associated brain areas – based on Holzel et al. 2011.**

Mechanisms	Associated Brain Areas
1. Attention regulation	Anterior cingulate cortex
2. Body awareness	Insula, temporoparietal junction
3a) Emotion regulation: reappraisal	(Dorsal) prefrontal cortex (PFC)
3b) Emotion regulation: exposure, extinction and reconsolidation	Ventro-medial PFC, hippocampus, amygdala
4. Change in perspective on the self	Medial PFC, posterior cingulate cortex, insula, temporoparietal cortex

Gotink et al. (47) describes the neurobiological effects of meditation based on 21 fMRI studies and 7 MRI. The results show that the prefrontal cortex, the cingulate cortex, the insula and the hippocampus increased their activity, connectivity and volume among individuals. Additionally, the amygdala decrease could be observed and its functional activity, which in overall influences functional connectivity with the prefrontal cortex and earlier deactivation after exposure to emotional stimuli.

Marchand (48) further explains that mindfulness meditation influences the function of the medial cortex and associated default mode network as well as amygdala and insula. Furthermore, mindfulness meditation practice affects lateral frontal regions and most likely basal ganglia. The brain structural imaging studies also indicate changes in the hippocampus.

### **Clinical applications and efficacy of mindfulness-based interventions**

Goyal, et al. (49) investigated the effects of systemic and protocolized MBI programs such as MBSR and MBCT in order to evaluate the effects of meditation programs on behaviors and emotions affected by stress. The analysis focused on negative affect, such as anxiety and stress as well as positive affect (e.g., well-being), and – among others – attention, behaviors affected by stress (substance use, sleeping disorders, eating disorders), pain reduction. The authors included RCTs that used one or more control groups in which the amount of time and attention provided by the control intervention was comparable to that of the meditation program. The meta-analyses were conducted using standardized mean differences to obtain aggregate estimates of effect size (ES) with 95 percent confidence intervals (CI). 17801 citations were reviewed, 47 trials were included that consisted of 3320 participants. Homework assessment was not provided in many trials nor home practice was recommended. Moderate evidence was found for mindfulness meditation programs to reduce symptoms in anxiety disorders [ES 0.38 (CI 0.12 to 0.64) at 8 weeks; ES 0.22 (0.02 to 0.43) at 3-6 months follow up], depression [ES 0.30 (0.00 to 0.59) at 8 weeks; ES 0.23 (0.05 to 0.42) at 3-6 months follow up] and pain [ES 0.33 (0.03 to 0.62)], and low evidence in decreasing stress/distress and mental health-related quality of life. Either low evidence, no effect or insufficient evidence of any effect of meditation programs was found on positive mood, attention, substance use, eating, sleep and weight. Also, no evidence was found that meditation programs were better than any active treatment (drugs, exercise, other behavioral therapies). The authors also observed that when components of negative affect (anxiety, depression or stress/distress) are combined, domains of negative affect improve in mindfulness programs when compared with a non-specific active control. The effect sizes over the course of 2-6 months ranged from 0.22-0.38 for anxiety symptoms and 0.23-0.30 for depressive symptoms, what is comparable with what is expected from the pharmacological treatment (antidepressant).

Goldberg et al. (50) decided to explore Goyal's analysis and investigated the effects of MBI (MBSR and MBCT) programs only due to systemic and protocolized program – 8 weekly meetings, 2,5 hr, 1 day of retreat and, home practice, an experienced, certified mindfulness teacher) on psychiatric disorders. A total of 142 non-overlapping samples and 12,005 participants were included. The authors aimed to evaluate the degree to which outcomes are influenced

by the characteristics of the control group. A more detailed comparison to type of control condition provided information on efficacy on mindfulness meditation interventions. The authors conducted a first such a comprehensive meta-analysis of all RCTs examining the effects of mindfulness-based interventions on disorder-specific symptoms across adult psychiatric populations, due to many questions raised by critics regarding reporting positive outcomes selectively or stressing the use of non-active control group in randomized clinical trials. The authors divided and coded the comparison group into five categories: no treatment, (no intervention for the control condition beyond that which was provided to the treatment group) minimal treatment (very brief interventions, e.g., up to 10-minute individual counseling sessions for smoking cessation), non-specific active control (active conditions for which no mechanism of change or clear rationale for treatment was provided, e.g., discussing air travel, shopping), specific active control (specific therapeutic interventions with theoretical rationale) and evidence-based treatment (e.g., CBT). This meta-analysis found MBIs to have superior effects on outcomes for anxiety, depression, physical pain, schizophrenia, weight/eating-related disorders and addictions. The strongest evidence of efficacy was found for treatments of depression, the results also support the use of mindfulness in treatment of pain conditions, and addictive disorders/substance abuse (the authors do not specify the specific conditions except for nicotine and drug addiction, however state that they were categorized based on Diagnostic and Statistical Manual of Mental Disorders 5<sup>th</sup> edition). The detailed results at post-treatment show that mindfulness-based interventions are superior to no treatment ( $d = 0.55$ ,  $p < 0.001$ ), minimal treatment ( $d = 0.37$ ,  $p = 0.210$ ), non-specific active controls ( $d = 0.35$ ,  $p = 0.010$ ) and specific active controls ( $d = 0.23$ ,  $p < 0.001$ ), however mindfulness conditions did not differ from evidence-based treatments ( $d = -0.004$ ). At follow-ups, which were various across studies, mindfulness-based interventions were superior to no treatment conditions ( $d = 0.50$ ,  $p < 0.001$ ), non-specific active controls ( $d = 0.52$ ,  $p < 0.010$ ), and specific active controls ( $d = 0.29$ ,  $p < 0.001$ ). Similarly to post-treatment, no difference was observed comparing to minimal treatment conditions ( $d = 0.38$ ,  $p < 0.330$ ) and evidence-based treatments ( $d = 0.09$ ,  $p < 0.001$ ). The findings suggest that mindfulness treatment have similar potency with first-line psychological and psychiatric interventions with relatively little variation across disorders.

Mindfulness interventions, MBCT in particular, have been shown to reduce symptoms in patients with clinical depressive disorders (51). The results of Kuyken's meta-analysis support the evidence of larger effect of MBCT in comparison with other usual treatments including antidepressants. The meta-analysis comprised of 1258 patients, the mean (SD) age was 47.1 years, of which 75% (944) were female. Individuals receiving MBCT had a reduced risk of depressive relapse within a 60-week follow-up period compared with those patients who did not receive mindfulness intervention.

This corresponds with the Piet and Hougaard's study (52), in which the authors evaluated MBCT program among patients with recurrent major depressive disorder. Six RCTs with a total number of 593 individuals were included in the meta-analysis and in two studies MBCT demonstrated the same level of effectiveness as maintenance of pharmacotherapy.

Additionally, both MBSR and MBCT show possible positive effects for older adults experiencing a variety of geriatric health concerns (53). Seven RCTs of MBSR or MBCT

programs conducted exclusively for older people were evaluated in meta-analysis. The results support the use of mindfulness interventions symptoms of anxiety and depression, sleep quality, chronic insomnia or cognitive challenges.

MBIs were found efficient in improving behavioral and mental health outcomes among children and adolescents (54, 55, 56). The authors stress that mindfulness trainings can strengthen core cognitive skills and enhance emotion self-regulation, also adolescence being a period when around 50% of all mental health problems appear before the age of 14. Dunning and his team (57) pointed out the importance of introducing mindfulness to young people. The authors conducted the meta-analysis out of randomized, controlled trials (RCT) in which the interventions were focused mainly on mindfulness meditation originated from the MBSR program rather than other than informal activities. 33 independent RCT studies published up to October 2017, featuring 3666 children and adolescents were included in the meta-analysis. The outcomes measures were categorized into cognitive, behavioral and emotional factors and separate analysis were completed for seventeen studies with an active control group, including 1762 children and adolescents. Significant changes were observed in Mindfulness, Executive Functioning, Attention, Depression and Anxiety/Stress categories, however the effect size was small (Cohen's  $d$  ranging from 0.16 to 0.30). Among RCTs with active control groups, positive outcomes were observed only in Mindfulness ( $d = .42$ ), Depression ( $d = .47$ ) and Anxiety/Stress ( $d = .18$ ) categories with small to moderate effect size (Cohen's  $d$  ranging from 0.18 in Anxiety/Stress to 0.47 in Depression).

Xinli Chi with her team provide similar results (58). The authors conducted the meta-analysis based on RCTs evaluating original and full MBSR program among young people (aged 12-25) clinically diagnosed as depressed using ICD-10 od DSM-5 or who, on a depression scale (Center of Epidemiologic Studies Depression Scale) scored above >16. Eighteen RCTs including 2,042 participants comprised of the meta-analysis. There were three control groups: no treatment, treatment as usual (standard medical treatment or other standard practices), or active control condition with any nontherapeutic activities (e.g., health education or relaxing activities). MBSR had moderate, positive effects in reducing depressive symptoms at the end of intervention in comparison to control groups. No significant changes were observed in the follow up measure. Meta-regression analysis indicated that the average treatment effect could be moderated by treatment duration and participants depression at baseline.

## Discussion

Mindfulness practice has a longstanding history, but it's only quite recently that interventions based on it have been incorporated into medicine. MBIs have gained consistent evidence for their efficacy to treat psychiatric disorders. Various research papers proved that mindfulness based therapies, especially MBSR and MBCT, are efficacious for treating depression symptoms and reduce possibility of depression relapse. Moreover, the interventions reduce symptoms across numerous psychiatric disorders, to name anxiety disorders, eating disorders and substance abuse. However, MBSR and MBCT trainings are conceptualized as a form of mental training in which one should practice regularly to achieve a better result. It is also important to stress that there is a relationship between the effects of training and the amount of individual practice between meetings (59, 60)

In some of the analysis the homework data have not been assessed, which makes it difficult to recognize the amount of practice needed to observe the results. Perhaps the future research should concentrate on motivating participants to filling the diary with the amount of time devoted to a particular practice during the week and the analysis to should examine the relationship between the individual practice and the effects of the training. The research on homework assessment of MBSR and MBCT programs stress that the participants tend to do less home practice than recommended (around 60%) and that these data are only declarative and it is difficult to adequately assess their quality what can influence the actual results (61).

Even though we know much about the patients populations that benefit from participating in mindfulness training, there is still little knowledge on what is the "active ingredient" that influences the results, whether it is e.g., group motivation and ability to share experiences or specific mindfulness practice. It is important to identify which interventions and for whom work best, given the strong movement towards individual and personalized care as well as time the patient spends in hospital care. More work is needed to give clinicians a better understanding on how to integrate the interventions and what is most beneficial. For example, comparisons of group therapy and individual therapy of MBCT showed that both trainings effects were equally satisfactory and significantly reduced significant reduction the symptoms of depression and anxiety and an increased the self-compassion (62). However, although integration of mindfulness into individual psychotherapy holds some advantages, there are potential areas of challenge: therapists need professional training in mindfulness and personal practice and experience that could prevent misuse of mindfulness in psychotherapy settings (63, 64).

It is proved that mindfulness interventions may reduce psychiatric symptoms, but it is less known whether they are compatible with maintenance pharmacotherapy and in what clinical populations can serve as a valid alternative. So far mindfulness interventions serve as an adjunctive treatment to psychotherapy or pharmacological treatment. Huijbers et al. conducted two research on discontinuing antidepressant medication after MBCT and proved different results: an increased risk of relapse in recurrent depression in patients withdrawing from antidepressant medication after MBCT program (65) and MBCT being one of the form of support for patients discontinuing pharmacotherapy: within 6 months 53% of individuals fully discontinued antidepressant medication (66). Similarly Hamidian proved significant improvement in depression symptoms and emotions' regulation among patients by combining MBCT with pharmacotherapy in comparison to pharmacotherapy alone (67). Further research needs to be done to examine for whom specifically mindfulness interventions could be offered. The group programs can be a part of a standard part in hospital care, however recommendations for providers are needed to differentiate between motivated and unmotivated individuals, those with mild – moderate up to strong psychiatry disorders symptoms, age and ability to understand and change habits.

## Conclusions

There is an empirical evidence that mindfulness-based interventions are widely used in healthcare setting. Various research have found beneficial effects of MBSR and MBCT

programs on a range mental health problems. Given the potential usefulness, mindfulness may increase the range of treatment choices for patients. Recent meta-analyses show that MBIs, MBCT in particular, should be placed among other evidence-based therapies in the treatment of depression. Emerging evidence suggest also that MBSR is promising treatment modality for wide range of anxiety disorders. Mindfulness based programs may also improve cognitive, anxiety and mood-related conditions in adolescents. It seems that MBCT and MBSR programs, depending on a psychiatric condition, can be combined with standard pharmacological therapies in order to reinforce the results of medical treatment. Clinical applications of mindfulness interventions will require a very good understanding of psychological treatments and distinguishing between different types of psychiatric disorders.

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