A Pilot Study of an Online Brief Mindfulness-Based Intervention to Improve the Well-Being of Managers and Reduce Their Stress at Work

Ángela Asensio-Martínez [1,2], Lorena Adame [2], Alejandra Aguilar-Latorre [1,3*], Benito Millán [2], Marta Domínguez-García [2,3,4], Rosa Magallón-Botaya [2,3,4].

[1]Department of Psychology and Sociology, University of Zaragoza, Zaragoza, Spain. acasensi@unizar.es aaguilar@unizar.es

[2] Department of Medicine, Psychiatry and Dermatology, University of Zaragoza, Zaragoza, Spain. lorena.meditation@gmail.com, benitoamillan@yahoo.es

[3] Institute for Health Research Aragón (IIS Aragón), Zaragoza, Spain.

[4] Aragonese Health Service, Zaragoza, Spain. mardoga5@gmail.com rosamaga@unizar.es

*Correspondence: aaguilar@unizar.es; Tel.: 0034685304966

Author Contributions

Conceptualization, Ángela Asensio-Martínez, Lorena Adame and Benito Millán; Data curation, Ángela Asensio-Martínez, Lorena Adame, Alejandra Aguilar-Latorre and Benito Millán; Formal analysis, Ángela Asensio-Martínez, Lorena Adame and Benito Millán; Funding acquisition, Rosa Magallón-Botaya; Investigation, Ángela Asensio-Martínez, Lorena Adame and Benito Millán; Methodology, Ángela Asensio-Martínez, Lorena Adame, Alejandra Aguilar-Latorre and Benito Millán; Project administration, Ángela Asensio-Martínez; Resources, Ángela Asensio-Martínez; Software, Ángela Asensio-Martínez, Lorena Adame and Benito Millán; Supervision, Ángela Asensio-Martínez ; Validation, Ángela Asensio-Martínez, Lorena Adame and Benito Millán; Visualization, Ángela Asensio-Martínez, Lorena Adame and Benito Millán; Writing – original draft, Ángela Asensio-Martínez, Lorena Adame and Benito Millán; Writing – review & editing, Ángela Asensio-Martínez, Lorena Adame,

Alejandra Aguilar-Latorre, Benito Millán, Marta Domínguez-García and Rosa Magallón-Botaya.

Funding

None.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and with the current regulations, relating to data protection (Organic Law 3/2018, of December 5th, on the Protection of Personal Data and digital rights guarantee).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Acknowledgments

We wish to thank the University of Zaragoza, the Aragonese Primary Care Research Group (GAIAP, B21_23R) that is part of the Department of Innovation, Research and University at the Government of Aragón (Spain); the Institute for Health Research Aragón (IIS Aragón); the Research Network on Chronicity, Primary Care, and Health Promotion (RICAPPS) that received a research grant from the Carlos III Institute of Health, Ministry of Science and Innovation (Spain), awarded on the call for the creation of Health Outcomes-Oriented Cooperative Research Networks (RICORS), with reference RD21/0016/0005, co-funded with European Union – NextGenerationEU funds, which finance the actions of The Recovery and Resilience Facility (RRF); the University of Zaragoza; and Feder Funds "Another way to make Europe".

Conflicts of Interest: The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

Abstract

Purpose: The COVID-19 pandemic, remote work, and new technologies have heightened workplace pressures. Effective response and essential organizational changes require business leaders to be more adaptable, with managers' presence playing a pivotal role in successful implementation. The study assesses a brief Mindfulness-Based Emotional Regulation for Managers (MBERM), to reduce workplace stress and enhance managerial well-being.

Materials and Methods: An eight-week non-randomized controlled trial was conducted with a waiting list control group and an intervention group. Pre-post differences were measured by Student t-test or Wilcoxon test, and effect size was calculated using the Hedges g formula. The sample included 23 managers (17 men and 6 women) with an average age of 50. The study assessed anxiety and depressive symptoms, psychological flexibility, perceived self-efficacy, general work-related well-being, perceived stress, and mindfulness.

Results: Statistically significant changes were observed in the intervention group in depression, anxiety, work-related acceptance and action, general self-efficacy, exhaustion, alienation, stress, and non-reactivity. The control group showed no statistically significant changes in any of the variables.

Conclusion: The MBERM intervention could improve the emotional and work-related well-being of managers and reduce stress levels and burnout. Further study of this intervention is needed to promote adherence and ensure a long-term improvement.

Keywords: Mindfulness; managers; online-intervention; job-stress; emotional regulation.

1. Introduction

In recent decades, there has been a growing concern in many countries about the increase in work-related stress and its psychophysiological consequences [1]. The pressure to respond quickly to work demands has increased as companies adopt new technologies, and the time to recover from stress has decreased [2]. In addition, the COVID-19 pandemic has been a source of intense stress and has increased remote working. Remote working blurs the boundaries between private and professional life and can have a negative impact on the mental health of workers [3]. Remote working also decreases social contact, which is associated with a high risk of psychological distress and depression [4]. Work stress occurs when there is an imbalance between the demands of work and the internal resources of the worker, which challenges their ability to cope with the situation [5]. Currently, around half of European workers consider stress a common factor in their workplaces. In Spain, 30% of absences from work are caused by stress, and the country has the third-highest rate of work-related stress in Europe with almost 500,000 people affected [6]. Long working hours, high pressure and responsibilities make managers especially prone to stress [7,8].

Two years after the start of the COVID-19 crisis in Europe, the VUCA environment (volatility, uncertainty, complexity, and ambiguity) has settled into companies, demanding greater adaptability of its managers as organizational changes are needed to deal with such a crisis [9,10]. The success of organizational changes is associated with managers' and employees' ability to be present [11,12].

The ability to be present or mindful is defined as the awareness and acceptance of the present moment. To intentionally and non-judgmentally notice thoughts, sensations and/or feelings without reacting to them [13,14]. It implies the self-regulation of attention and an attitude of curiosity, openness, and acceptance, without making a cognitive assessment of internal phenomena [15]. Mindfulness is a psychological resource to increase awareness and

skillfully respond to internal mental processes that contribute to psycho-emotional stress and can reduce emotional reactivity and volatility [16]. This capacity can be developed through psychotherapies that promote receptive attention to an experience or through different meditation practices [15,17]

Mindfulness-Based Interventions (MBIs) are programs aimed at improving well-being. Mindfulness-Based Stress Reduction (MBSR) [18] is an intensive and structured program consisting of 8 weekly sessions of 2 to 2.5 hours, and a retreat day of 7 or 8 hours. The main practices included are the body scan, sitting meditation, the raisin practice and hatha yoga. Participants are encouraged to anchor their attention on an object, such as the breath or body sensations becoming aware of it at every moment. When attending to whatever arises in the present, greater clarity of thought can be experienced, reducing unnecessary stress, and allowing for better decision-making [19]. Studies confirm the efficacy of the MBSR program for reducing physical and psychological symptoms of stress and improving quality of life [20,21].

Mindfulness training promotes spontaneity, creativity, and organizational resilience [22]. It favours workers' self-regulation, which promotes individual resilience and improves relationships and performance in the workplace [23]. The effectiveness of MBIs in reducing stress and improving well-being in various professions and with different types of employees has been shown in previous research [24]. Regarding MBIs in managers, previous studies have reported how to improve well-being, emotional awareness and resilience, and reducing stress [25–28]. Also, that by developing mindfulness, managers improve leadership capability and effectiveness, favoring transformational leadership behavior [26,29,30].

There is a need to create an MBI for managers which, in addition to mindfulness, develops metacognition and emotion management. The most recent studies on leadership show the need for managers to be aware of their emotions and know how to better regulate

them [16,31]. Mindfulness involves becoming aware of an emotional experience and to meet it without judgement. In the business world, managers tend to repress difficult emotions until they surface in an unhealthy way, compromising their clarity of mind and decision-making [15]. According to Ekman's model, emotions are closely related to cognition and therefore, greater emotional clarity is related to greater cognitive clarity. Mindfulness also enhances metacognition, the ability to monitor and control thought processes which is also connected to emotion regulation [32]. Mindfulness involves being aware regardless of the intensity of the emotion being experienced, without attempting to alter it. In this way, the individual can choose to identify with the thoughts, emotions and sensations that seem most appropriate to them, instead of simply reacting to them [33].

To influence organisational change, initiatives need to be implemented from the top down. For leaders to be emotionally available to the organization and its employees, they must first learn to regulate their own emotions and take care of themselves. Gooty et al. (2010) [34] stated that employees are influenced by their leaders' emotions. Their positive emotions create a positive impact on their followers, while difficult emotions will negatively affect them.

The main objective of this study was to analyse the effectiveness of MBERM in reducing work-related stress and increasing the occupational well-being of company managers. The secondary objectives were to examine the effectiveness of reducing anxious and depressive symptoms, improving psychological flexibility, and perceived self-efficacy, and increasing mindfulness capacity.

2. Materials and Methods

A pilot study, which was a non-randomized controlled trial, was conducted, involving both a waiting list control group and an intervention group. The intervention lasted eight weeks and pre- and post-evaluations were done.

2.1 Sample

As specified by García-García et al. the sample size recommended for pilot studies is between 20 and 50 participants, which must have the attributes desired to measure in the target population [35]. A convenience sample of 30 managerial positions from various companies and sectors was invited to participate in the study. The sample was recruited within the professional network of this study's research group. Participants were not randomly assigned to either the intervention or control groups, and they were aware of their group assignment (not blinded). Control group participants were explicitly informed that they were part of the waitlist control group and did not receive any interventions throughout the study.

From the initial sample of 30 subjects who were invited to participate in the study, a total of 23 subjects consented to participate, with 15 in the intervention group and 8 in the control group. The final sample comprised individuals who were of white ethnicity and Spanish nationality, residing in Spain.

In the intervention group, 25% were female, and 75% were male, with an average age of 49 years. All participants had attained a higher level of education, and the majority were married (87.5%). In the control group, the average age was 51 years, and all participants also had a higher level of education and were married. The gender distribution in this group was 75% men and 25% women. No significant differences were observed between the two groups in terms of these demographic characteristics.

Eleven out of 15 participants in the intervention group attended more than 60% of the sessions. Seven out of the eight selected participants attended at least 75% of the program.

2.2 Study Variables And Instruments

Anxiety and depressive symptoms were measured using the HADS scale [36], anxious symptoms include alteration in the sensations of tension, fear, worry, restlessness, physical sensations, and psychomotor agitation. Depressive symptoms include disturbance in the sensation of pleasure, mood, states of joy, psychomotor retardation, and the physical appearance of the person. These symptoms were evaluated through the validated Spanish version of the Hospital Anxiety and Depression Scale (HADS) [37], created in 1983 by Zigmond and Snaith to detect states of depression and anxiety through a self-assessment. The scale contains 14 items (7 for depression and 7 for anxiety) valued from 0 to 3, with 21 being the maximum assessment for anxiety and 21 for depression and has a high internal consistency of 0.88 [37]. A score of ≤7 is considered as 'normal', 8 to 10 as 'mild', 11 to 14 as 'moderate', and 15 to 21 as 'severe' for both the anxiety and depression screenings [36]. A higher score indicates a higher level of anxiety and depression. The internal consistency of the HADS is high (α = 0.88) [37], and in our sample was very good (α = 0.86).

Psychological flexibility is defined as the ability to be open, focused on the present, and to change or persist in behaviour according to changing internal and external circumstances [38]. It was measured with the validated Spanish version of the Work-Related Acceptance and Action Questionnaire (WAAQ), which is an adaptation to the work context of the Acceptance and Action Questionnaire (AAQ-II), to measure psychological flexibility through a self-report [39,40]. It has 7 items with a 7-point Likert scale. The maximum total score of 49, and a higher score indicates a higher level of psychological flexibility. With a Cronbach Alpha of 0.92, unifactorial structure and good construct validity [39]. The internal consistency of the WAAQ in our sample was very good (α = 0.88).

Perceived self-efficacy refers to a broad and stable sense of personal competence about how effective a person can be in dealing with a variety of stressful situations [41,42]. Evaluated through the validated Spanish version of the General Self-Efficacy Scale, created

by Schwarzer & Baessler in 1996, is a self-assessment of the perceived ability to handle different stressful situations. It has 10 items with 4-point Likert scales and a Cronbach Alpha coefficient of 0.87 and Spearman-Brown of 0.88 [42]. The minimum score is 10 and the maximum is 40. A higher score indicates a higher level of perceived self-efficacy. The internal consistency of the General Self-Efficacy Scale in our sample was good (α = 0.86).

Work related well-being consists of a set of evaluative judgments and emotional reactions concerning the degree to which one's work is experienced as satisfactory, pleasant, and positive [43]. Evaluated through the General Work Well-being Questionnaire (qBLG), developed in 2010 to measure occupational well-being by means of a self-report. It includes two different dimensions: psychosocial well-being (affect, skills, expectations) and side effects (somatization, exhaustion, alienation), scored with 2 scales with a semantic differential format and seven Likert scales. A higher score in the psychosocial well-being dimension indicates more psychosocial well-being. A higher score in the side effect dimension indicates worse well-being. The questionnaire shows a high internal consistency with Cronbach's Alpha values between 0.82 and 0.96 [43]. The internal consistency of the qBLG in our sample was excellent with Cronbach's Alpha values between 0,92 and 0.98.

Perceived stress is when an individual perceives those environmental demands exceed their capacity to adapt [44]. Evaluated with the validated Spanish version of the Cohen et al. Perceived Stress Scale [45], which measures the degree to which people evaluate their life situations as stressful during the last month. It consists of 14 items with a Likert response scale valued from 0 to 4, and a Cronbach Alpha of 0.81, with good reliability and good construct validity [44]. The total score is obtained by inverting the ratings of items 4, 5, 6, 7, 9, 10 and 13 and then adding the 14 items. A higher score indicates a higher level of perceived stress. The internal consistency of the Scale in our sample was good (α = 0.71).

Mindfulness is the present-centred awareness, which does not elaborate and does not judge, in which the thoughts, emotions or sensations that emerge in the attention field are recognized and accepted as they are [15]. It is evaluated through the Spanish version of the 5 Factors Mindfulness Questionnaire (FFMQ-E), by Baer [36]. It includes 39 items, with a 5-point Likert, in five different facets of mindfulness: observation, description, act awareness, not judging internal experiences, and not reacting to internal experiences. The dimension "observation" implies perceiving, recognizing, and feeling, the stimuli that appear in the perceptual field observed, and the minimum score is 8 and the maximum is 40. The dimension "description" implies the ability to label with words the perceived experience, and the minimum score is 8 and the maximum is 40. The dimension "act aware" implies being conscious during actions that are being carried out, the minimum score is 8 and the maximum is 40. The dimension "not judging internal experiences" entails equanimity and distancing concerning internal experience, and the minimum score is 8 and the maximum is 40. The dimension "not reacting to internal experiences" distances from internal experience creating a period in which a valued response to said experience can be chosen, and the minimum score is 7 and the maximum is 35. A higher score indicates a higher level of Mindfulness. With Cronbach Alpha values from 0.60 to 0.88 in different dimensions; reliability with values from acceptable to good and construct validity from acceptable to good in general [46]. A higher score indicates a higher level of Mindfulness. The internal consistency of the FFMQ-E in our sample was from good to excellent, with values from 0.74 to 0.94.

2.3 Procedure

The MBERM was designed and studied using new technologies (Zoom, Google Forms, WhatsApp, etc.) for communication. This provided a means to reconcile agendas (personal and professional demands as managers), the mobility restrictions and social distancing needs due to the pandemic. The brief intervention was inspired by the MBSR

program [18]. Based on practical and theoretical experimentation, it was expanded to include emotional management strategies and self-compassion training. An 8-week intervention was designed, MBERM (Mindfulness-Based Emotional Regulation for Managers), that integrates attentional practices, as well as interoceptive awareness, metacognition, and self-compassion practices. It also includes didactic presentations on psychoeducational subjects to generate a greater understanding of these topics and emotional experiences. It lasted 8 weeks, with weekly 1-hour sessions, and 10-minute meditation practices to perform outside the sessions (homework). Before the start of the first session and at the end of the last session, the measurement instruments were completed. Each session included mindfulness practices, time for inquiry where participants shared their experience of the practices, and time for psychoeducation.

The intervention adapted to sanitary restrictions with online delivery of 7 of the 8 sessions. The first session took place in person at the Faculty of Medicine of the University of Zaragoza, to foster group cohesion and trust. Several studies have researched the impact of online-delivered MBIs, and the results, although limited, are encouraging [47,48]. In response to the limitations of managers' timetables and the difficulty in recruiting volunteers, the intervention had shorter sessions and less home practice than other MBIs like the MBSR [8,49].

The meditation practices progressed from a short meditation on motivation for participating in the program; body scan; the raisin practice; noticing and counting the breath from 1 to 11 on several rounds; "Hello, thank you, goodbye" practice to notice and let thoughts pass by; conscious movement; noticing the breath (without counting); open monitoring mindfulness practice; "RAIN" meditation [50]; "Self-Compassion Break" meditation [51]; and finally writing a letter to oneself to state the motivation to continue practicing after the end of the program.

The psychoeducation included the following subjects in progressive order: An introduction to Siegel's Window of Tolerance [52]; what is and what isn't mindfulness; thoughts and internal dialogue; awareness of the bodily sensations; what an emotional experience is according to Ekman's research; the difference between pain and suffering; accepting uncomfortable feelings; what is and what isn't self-compassion and its importance and benefits.

2.4 Data Analysis

Pre- and post-intervention measures were taken for both groups and the data were stored, processed, and analysed through SSPS software (v. 2017). Initially, the normality of the data was verified by the Shapiro test and a descriptive analysis of all variables in both groups was performed: normal variables were described based on the mean and standard deviation, and non-normal variables were described through the median and interquartile range. Parametric tests (Student's t) were applied for normal variables and nonparametric tests (Wilcoxon Statistic) for non-normal variables in related samples. Subsequently, the effect size was calculated for both groups, using the Hedges's g formula. Then, to examine the possible efficacy of the intervention, a comparison of intergroup means was made, applying Student's t for normal variables and Mann-Whitney U for non-normal variables.

2.5 Ethical Aspects

The current study falls under the category of less than minimal risk, and no identifiable linked information is being collected or recorded for the study. All data was anonymized and treated in compliance with current regulations relating to data protection (Organic Law 3/2018, of December 5th, on the Protection of Personal Data and digital rights guarantee). The different surveys were sent through Google Forms, and Google's privacy conditions were informed, providing the link to such information and requesting prior approval as a requirement for participation in the study. Furthermore, all participants gave

their informed consent and were free to opt out of the surveys and/or protocol at any time. This study was conducted according to the guidelines of the Declaration of Helsinki and the Spanish Organic Law on Data Protection. Additionally, it was carried out under the tutelage of Ángela Asensio-Martínez, PhD, at the University of Zaragoza. In accordance with the legal and regulatory framework governing research ethics in our jurisdiction, studies such as ours, which involve less than minimal risk to participants and do not entail the collection or recording of identifiable linked information, were exempt from the requirement of ethics committee approval. This exemption is supported by the guidance provided in the book "Rule for the Protection of Human Subjects in Research in the Behavioral and Social Sciences" [53], as well as in the evaluation of research risks outlined in Rid et al. (2010) [54]. These sources emphasize the importance of assessing risk levels in research and provide criteria for determining when studies may be considered exempt from formal ethics committee review.

3. Results

As shown in Table 1, the intervention group (N = 15) at baseline had a mild anxiety level (8.40), normal depression (5.00), a moderate level of stress (24.27), a normal level of work-related acceptance and action (33.00), self-efficacy (31.00) and work well-being, and a low level in the dimensions of mindfulness. After the intervention, the group presented an improvement in some of their scores.

Table 1 presents the results intragroup of the mean comparison between pre and post for the intervention group (N=15), showing statistically significant changes ($p<0.05$) in the improvement of the following variables: anxiety, work-related acceptance and action, general self-efficacy, exhaustion, alienation, stress, and non-reactivity. Especially significant has been the decrease of the depression variable ($p<0.01$), being also firmly endorsed by the effect size value by the Hedges $g>0.8$. The rest of the results of the study variables were not significant.

[Insert Table 1 here]

The control group (Table 2) had a normal level of anxiety (7.00) and a normal level of depression (3.75), moderate stress (21.75), a normal level of work-related acceptance and action (35.75), self-efficacy (32.25), and of general work well-being, and a low level in the dimensions of mindfulness, maintaining those levels post-intervention.

Table 2 shows the results intragroup of the comparison between means of pre and post measurements for the control group (N=8), and no statistically significant changes ($p<0.05$) were observed in any of the objective variables of the study.

[Insert Table 2 here]

In order to carry out the intergroup statistical analysis with the same number of subjects, 8 subjects from the intervention group were selected based on their higher attendance of sessions. Table 3 shows the results intergroup of the mean comparison between the intervention group (N=8) and the control group (N=8) before the intervention. There are no significant differences between the two groups in either of their variables, so the groups are comparable.

[Insert Table 3 here]

Table 4 presents the comparison results intergroup of means between the intervention group (N=8) and the control group (N=8), after the intervention. There are no significant differences between the two groups, in any of their variables.

[Insert Table 4 here]

4. Discussion

The present pilot study analysed the effectiveness of MBERM to reduce work-related stress and increase the occupational well-being of company managers. The secondary objectives were to examine the effectiveness of reducing anxious and depressive symptoms,

improving psychological flexibility, and perceived self-efficacy, and increasing mindfulness capacity.

After the MBERM intervention, the results showed that the intervention group had significant improvements in depression, anxiety, work-related acceptance and action, general self-efficacy, exhaustion, alienation, stress, and non-reactivity. The control group did not show statistically significant changes in any of the study variables after the MBERM intervention. Results are supported by the systematic review carried out by Kotera and Van Gordon [55] in which they confirmed how training practices in self-compassion increase work-related well-being, in education, health and service sectors. Previous studies, of other professions, showed similar results in terms of the reduction of stress, depressive and anxious symptoms through mindfulness practices [19,24,56–58]. This could lead to improvement in leadership skills such as the ability to adapt to change and greater personal well-being of leaders through MBIs [59]. However, the different dimensions of mindfulness did not present significant improvements although their scores were increased. A trend that reflects how the effects of MBIs are strengthened with a more continuous and prolonged practice over time [60]. This could be related to shorter sessions in MBERM, one hour compared to two and a half hours pre-scribed in the original MBSR program [18]. Although there is evidence to support what dose intensity is required for behaviour change, it is not yet definitive [61]. In addition, factors related to the program, the participants and the teachers/leaders contribute to the fact that the effects vary according to the individual and the context, the teacher, and the

leader [58,61]. All this points to the need to explore whether the improvements made in plenary are the mechanism by which other outcomes have been achieved [25].

In addition, to examine whether the improvements in the intervention group were due to the MBERM intervention, a comparison of the means between the groups was carried out after the intervention. The results showed that there were no significant differences between the two groups in any of their variables after the intervention. Similar results were found in a previous meta-analysis that quantitatively reviewed research on leadership mindfulness in terms of self-reported levels of mindfulness and mindfulness interventions. They found that the difference in post-intervention gains between the intervention and control groups was not statistically significant, although the effect was in the expected direction [62]. Therefore, the improvements in the intervention group could be due to other factors. This reflects the complexity of the effects of mindfulness on behaviour change [61,63]. In addition, the small sample size may have affected the statistical power [64].

Leader mindfulness is significantly related to leader well-being, relationships, leadership styles and skills, and job performance, as well as to follower well-being, contributing to improved organizational outcomes [12,62]. However, the quality of previous research is highly variable, reflecting the need for more studies that allow us to delve deeper into leader mindfulness and the mechanisms and effects of MBI [25,58]. Future research will be relevant and allow us to delve deeper into the effectiveness of MBI interventions for improving organizational resilience and training transformational leaders and their emotional

regulation [22,31,65] to improve levels of occupational health. organizational effectiveness and performance.

4.1 Limitations

The pilot study had a few limitations that affected the quality of the results obtained, the most important being the small sample size, which may bias the results [66] and make them less generalisable. It is therefore recommended that a randomised controlled trial with a larger sample of managers to statistically confirm the results. There is also a gender bias because the composition of the sample in both the control and intervention groups was mainly male, reflecting the current low parity in managerial levels. This fact was confirmed in 2021 by the European Institute for Gender Equality [67], which shows only 30.7% of women on Ibex-35 companies' Board of Directors. It has also been shown that women may face more stress at managerial levels due to several factors, which is why it is important to look specifically at the impact on this sub-group [68,69]. Within the limitations of the study, we also find the difficulty in adherence to the intervention and the lack of collecting data regarding practice time at home. Although the design of the intervention was adapted to best suit the participants' needs, they still presented difficulties both in attending the sessions and doing the meditation practices at home. This is a common aspect in MBIs [58], which could improve with the use of new technologies to increase daily practice and reduce drop-out rates [69]. Adherence is an important factor as continuous practice over time supports the gradual improvement of the study variables, and online delivery may have negatively impacted adherence to the program [68]. Finally, another limitation present in this pilot study was the bias of information produced by the participants knowing their group of intervention, which resulted in the control group, although being on a waiting list, showing a lack of interest in the study, reducing their participation.

Conclusion

In conclusion, this pilot study indicates that the MBERM intervention shows improvement in the emotional and work-related well-being of managers and reduces their stress levels and burnout. Further studies are needed to examine the efficacy of the MBERM intervention and the use of new technologies to promote adherence, complement and strengthen meditative practices, and ensure an improvement in well-being.

References

[1] Chandola T. Stress at Work- A report prepared for the British Academy. the British Academy. 2010.

[2] Horesh D, Brown AD. Traumatic stress in the age of COVID-19: A call to close critical gaps and adapt to new realities. Psychol Trauma. 2020;12:331–335.

[3] Crawford J. Working from Home, Telework, and Psychological Wellbeing? A Systematic Review. Sustainability. 2022;14:11874.

[4] Hamouche S. COVID-19 and employees' mental health: stressors, moderators and agenda for organizational actions. Emerald Open Research. 2020;2:15.

[5] Houtman I, Jettinghoff K, Cedillo L. Sensibilizando sobre el estrés laboral en los países en desarrollo. Un riesgo moderno en un ambiente de trabajo tradicional. Consejos para empleadores y representantes de los trabajadores [Raising awareness about work stress in developing countries. A modern risk in a traditional work environment. Advice for workers and worker representatives]. World Health Organization. 2015;5:1-41. Spanish.

[6] Agencia Europea para la Seguridad y la Salud en el Trabajo. ESENER 2019 - Informe de política | Safety and health at work EU-OSHA [Internet]. 2019 [cited 2022 Jan 25]. Available from: https://osha.europa.eu/es/publications/esener-2019-policy-brief.

[7] Stranks JW. Stress at work : management and prevention. Elsevier/Butterworth-Heinemann; 2005.

[8] Hernández-Estrada A, Díaz-Rojas A. Indicadores de vulnerabilidad al estrés en directivos y su relación con factores de estrés organizacional [Indicators of vulnerability to stress in managers and their relationship with organizational stress factors]. Revista de Ciencias Médicas de Pinar del Río. 2012;16:181-194. Spanish.

[9] Tudorache P, Ispas L, Barsan G. Preparing Today's Leaders for VUCA Environments. In: Brătianu C, Zbuchea A, Anghel F, et al., editors. Strategica International Academic Conference - eighth edition -. Bucharest: Tritonic Publishing House; 2020.

[10] Aftab S, Khalid K, Waheed A, et al. Role of agile leadership in managing inter-role conflicts for a satisfying job and life during COVID-19 in a VUCA world. Front Psychol. 2022;13:979792.

[11] Anderson D, Ackerman L. Human dynamics: From resistance to commitment. Beyond Change Management. Pfeiffer; 2010. p. 131–160.

[12] Gupta A, Reina CS. Leading Through Crisis: The Role of Mindfulness. Springer, Cham; 2022. p. 269–285.

[13] Kabat-Zinn J. Mindfulness-Based Interventions in Context: Past, Present, and Future. Clinical Psychology: Science and Practice. 2003;10:144–156.

[14] Asensio-Martínez A, Magallón-Botaya R, García-Campayo J. Revisión histórica de los conceptos utilizados para definir mindfulness y compasión [Historical review of the concepts used to define mindfulness and compassion]. Mindfulness Compassion. 2017;2:86-91. Spanish.

[15] Bishop SR, Lau M, Shapiro S, et al. Mindfulness: A Proposed Operational Definition. Clinical Psychology: Science and Practice. 2004;11:230–241.

[16] Françoise D. Pleine-conscience et management : effet de la mindfulness sur la relation au travail et le style de leadership des managers [Mindfulness and management: effect of mindfulness on the relationship at work and the leadership style of managers]. 2016.

[17] Virgili M. Mindfulness-based coaching: Conceptualisation, supporting evidence and emerging applications. International Coaching Psychology Review. 2013;8:40–57.

[18] Kabat-Zinn J. An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: theoretical considerations and preliminary results. Gen Hosp Psychiatry. 1982;4:33–47.

[19] Lomas T, Medina JC, Ivtzan I, et al. Mindfulness-based interventions in the workplace: An inclusive systematic review and meta-analysis of their impact upon wellbeing. J Posit Psychol. 2019;14:625–640.

[20] Hathaisaard C, Wannarit K, Pattanaseri K. Mindfulness-based interventions reducing and preventing stress and burnout in medical students: a systematic review and meta-analysis. Asian J Psychiatr. 2021;69:102997.

[21] Kriakous SA, Elliott KA, Lamers C, et al. The Effectiveness of Mindfulness-Based Stress Reduction on the Psychological Functioning of Healthcare Professionals: a Systematic Review. Mindfulness (N Y). Springer; 2021. p. 1–28.

[22] Limphaibool W, Buranapin S, Jariangprasert N. Mindful Leadership as a Predictor of Organizational Resilience. The International Journal of Interdisciplinary Organizational Studies. 2021;16:1–12.

[23] Glomb TM, Duffy MK, Bono JE, et al. Mindfulness at work. Research in Personnel and Human Resources Management. Emerald Group Publishing Ltd; 2011.

[24] Janssen M, Heerkens Y, Kuijer W, et al. Effects of Mindfulness-Based Stress Reduction on employees' mental health: A systematic review. Ebmeier K, editor. PLoS One. 2018;13:e0191332.

[25] Donaldson-Feilder E, Lewis R, Yarker J. What outcomes have mindfulness and meditation interventions for managers and leaders achieved? A systematic review. European Journal of Work and Organizational Psychology. 2019;28:11–29.

[26] Lange S, Rowold J. Mindful leadership: Evaluation of a mindfulness-based leader intervention. Gruppe Interaktion Organisation Zeitschrift fur Angewandte Organisationspsychologie [Internet]. 2019 [cited 2023 Nov 20];50:319–335. Available from: https://link.springer.com/article/10.1007/s11612-019-00482-0.

[27] Schubin K, Seinsche L, Pfaff H, et al. A workplace mindfulness training program may affect mindfulness, well-being, health literacy and work performance of upper-level ICT-managers: An exploratory study in times of the COVID-19 pandemic. Front Psychol. 2023;14:994959.

[28] Urrila LI. From personal wellbeing to relationships: A systematic review on the impact of mindfulness interventions and practices on leaders. Human Resource Management Review. 2022;32:100837.

[29] Baron L, Rouleau V, Grégoire S, et al. Mindfulness and leadership flexibility. Journal of Management Development. 2018;37:165–177.

[30] Tan N, Peters EK, Reb J. Effects of a Mindfulness-Based Leadership Training on Leadership Behaviors and Effectiveness. Mindfulness (N Y) [Internet]. 2023 [cited 2023 Nov 20];14:2181–2194. Available from: https://link.springer.com/article/10.1007/s12671-023-02209-1.

[31] Torrence BS, Connelly S. Emotion Regulation Tendencies and Leadership Performance: An Examination of Cognitive and Behavioral Regulation Strategies. Front Psychol. 2019;10:421745.

[32] Martinez ME. What is metacognition? Phi Delta Kappan. SAGE PublicationsSage CA: Los Angeles, CA; 2006. p. 696–699.

[33] Chambers R, Gullone E, Allen NB. Mindful emotion regulation: An integrative review. Clin Psychol Rev. 2009;29:560–572.

[34] Gooty J, Connelly S, Griffith J, et al. Leadership, affect and emotions: A state of the science review. Leadership Quarterly. JAI; 2010. p. 979–1004.

[35] García-García JA, Reding-Bernal A, López-Alvarenga JC. Cálculo del tamaño de la muestra en investigación en educación médica [Sample size calculation in medical education research]. Investigación en Educación Médica. 2013;2:217-224. Spanish.

[36] Stern AF. The Hospital Anxiety and Depression Scale. Occup Med (Chic Ill). 2014;64:393–394.

[37] Herrero MJ, Blanch J, Peri JM, et al. A validation study of the hospital anxiety and depression scale (HADS) in a Spanish population. Gen Hosp Psychiatry. 2003;25:277–283.

[38] Ben-Itzhak S, Bluvstein I, Maor M. The Psychological Flexibility Questionnaire (PFQ): Development, Reliability and Validity. WebmedCentral Psychology. 2014;5:1–10.

[39] Ruiz FJ, Odriozola-González P. The Spanish version of the Work-related Acceptance and Action Questionnaire (WAAQ). Psicothema. 2014;26:63–68.

[40] Bond FW, Lloyd J, Guenole N. The work-related acceptance and action questionnaire: Initial psychometric findings and their implications for measuring psychological flexibility in specific contexts. J Occup Organ Psychol. 2013;86:331–347.

[41] Bandura A. Perceived self-efficacy in the exercise of personal agency. J Appl Sport Psychol. 1990;2:128–163.

[42] Sanjuán-Suárez P, Pérez-García AM, Bermúdez-Moreno J. Escala de autoeficacia general: Datos psicométricos de la adaptación para población española [General self-efficacy scale: Psychometric data of the adaptation for the Spanish population]. Psicothema. 2000;12:509-513. Spanish.

[43] Blanch JM, Sahagún M, Cantera L, et al. Cuestionario de bienestar laboral general: estructura y propiedades psicométricas [General occupational wellbeing questionnaire: structure and psychometric properties]. Revista de Psicología del Trabajo y de las Organizaciones. 2010;26:157-170. Spanish.

[44] Remor E. Psychometric properties of a European Spanish version of the Perceived Stress Scale (PSS). Spanish Journal of Psychology. 2006;9:86–93.

[45] Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. J Health Soc Behav [Internet]. 1983 [cited 2022 Jan 20];24:385–396. Available from: /record/1984-24885-001.

[46] Quintana Santan BM. Evaluación del Mindfulness: aplicación del cuestionario Mindfulness de cinco facetas (FFMQ) en población española [Mindfulness evaluation: application of the five-facet Mindfulness questionnaire (FFMQ) in the Spanish population]. Universidad Complutense de Madrid. 2016;1-255. Spanish.

[47] Riley TD, Roy S, Parascando JA, et al. Mindfulness-Based Stress Reduction Live Online During the COVID-19 Pandemic: A Mixed Methods Feasibility Study. Journal of Integrative and Complementary Medicine. 2022;28:497–506.

[48] Egger SM, Frey S, Sauerzopf L, et al. A Literature Review to Identify Effective Web- and App-Based mHealth Interventions for Stress Management at Work. Workplace Health Saf. 2023;216507992311708.

[49] Hobson J, Beach JR. An Investigation of the Relationship between Psychological Health and Workload among Managers. Occup Med (Chic Ill). 2000;50:518–522.

[50] Brach T. The RAIN of Self-Compassion. Advances in Contemplative Psychotherapy. Routledge; 2018. p. 146–154.

[51] Neff K, Germer C. The Mindful Self-Compassion Workbook: a proven way to accept yourself, build inner strength, and thrive. New York: Guilford Press.; 2018.

[52] Siegel DJ. The developing mind: how relationships and the brain interact to shape who we are. New Yowk: The Guilford; 1999.

[53] National Research Council. Determining Minimal Risk in Social and Behavioral Research. Rule for the Protection of Human Subjects in Research in the Behavioral and Social Sciences. Washington, DC: The National Academies Press; 2014.

[54] Rid A, Emanuel EJ, Wendler D. Evaluating the risks of clinical research. JAMA [Internet]. 2010 [cited 2024 May 3];304:1472–1479. Available from: https://pubmed.ncbi.nlm.nih.gov/20924013/.

[55] Kotera Y, Van Gordon W. Effects of Self-Compassion Training on Work-Related Well-Being: A Systematic Review. Front Psychol. 2021;12:1142.

[56] Bartlett L, Martin A, Neil AL, et al. A systematic review and meta-analysis of workplace mindfulness training randomized controlled trials. J Occup Health Psychol. 2019;24:108–126.

[57] Restrepo J, Lemos M. Addressing psychosocial work-related stress interventions: A systematic review. Work. 2021;70:53–62.

[58] Zhang D, Lee EKP, Mak ECW, et al. Mindfulness-based interventions: an overall review. Br Med Bull. 2021;138:41–57.

[59] Urrila LI. From personal wellbeing to relationships: A systematic review on the impact of mindfulness interventions and practices on leaders. Human Resource Management Review. 2022;32.

[60] Goyal M, Singh S, Sibinga EMS, et al. Meditation programs for psychological stress and well-being: a systematic review and meta-analysis. JAMA Intern Med. 2014;174:357–368.

[61] Schuman-Olivier Z, Trombka M, Lovas DA, et al. Mindfulness and Behavior Change. Harv Rev Psychiatry. 2020;28:371–394.

[62] Zhou Y, Wang C, Sin H-P. Being "there and aware": a meta-analysis of the literature on leader mindfulness. European Journal of Work and Organizational Psychology. 2023;32:299–316.

[63] Van Dam NT, van Vugt MK, Vago DR, et al. Mind the Hype: A Critical Evaluation and Prescriptive Agenda for Research on Mindfulness and Meditation. Perspectives on Psychological Science. 2018;13:36–61.

[64] Hackshaw A. Small studies: strengths and limitations. European Respiratory Journal. 2008;32:1141–1143.

[65] López-Vílchez JJ, Grau-Alberola E, Gil-Monte PR. Relación entre los estilos de Liderazgo Transformacional y Laissez-faire y el Síndrome de Quemarse por el Trabajo en profesores de educación secundaria [Relationship between Transformational and Laissez-faire Leadership

styles and Burnout Syndrome in secondary education teachers]. Acciones e Investigaciones Sociales. 2018;1:223-254. Spanish.

[66] Canal Díaz N. Técnicas de muestreo. Sesgos más frecuentes [Sampling techniques. Most frequent biases]. Métodos estadísticos para enfermería nefrológica. 2009. p. 121-132. Spanish.

[67] European Institute for Gender Equality. Browse Gender Statistics | Gender Statistics Database | European Institute for Gender Equality [Internet]. What lies behind the gender pay gap? 2019 [cited 2022 Jan 20]. Available from: https://eige.europa.eu/gender-statistics/dgs.

[68] Lacaille J, Sadikaj G, Nishioka M, et al. Daily Mindful Responding Mediates the Effect of Meditation Practice on Stress and Mood: The Role of Practice Duration and Adherence. J Clin Psychol. 2018;74:109–122.

[69] Horrillo-Álvarez B, Marín-Martín C, Abuín MR. La Adherencia al Entrenamiento en Meditación Mindfulness con Registro en Papel y en Aplicación Móvil [Adherence to mindfulness meditation training with paper registration and mobile application]. Clin Salud. 2019;30:99-108. Spanish.

Table 1.

Descriptive Results and Comparison Between Means of Pre- and Post-Intervention for the Intervention Group (IG)

	PRE	**POST**	***t/Z***	***p-value***	***Hedge's d/g***
Anxiety*, M (SD)*	8.40 (3.22)	7.00 (2.61)	2.88	0.01[a*]	0.338
Depression, *Mdn (IQR)*	5.00 (10.00)	2.00 (6.00)	-3.07	0.00[b**]	0.865
Work-Related Acceptance and Action, *Mdn (IQR)*	33.00 (29.00)	35.00 (23.00)	-2.13	0.03[b*]	0.466
General self-efficacy, *Mdn (IQR)*	31.00 (16.00)	31.00 (17.00)	-2.36	0.01[b*]	0.116
General Work Wellbeing (qBLG)					
Affect, *Mdn (IQR)*	52.00 (46.00)	56.00 (56.00)	-1.53	0.12[b]	0.223
Skills, *Mdn (IQR)*	57.00 (37.00)	60.00 (41.00)	-1.42	0.15[b]	0.284
Expectations, M (SD)	101.07 (28.81)	108.87 (32.72)	-1.67	0.11[a]	0.179
Somatization, *Mdn (IQR)*	11.00 (22.00)	10.00 (19.00)	-1.02	0.30[b]	0.243
Wear, M (SD)	17.13 (5.02)	15.00 (7.15)	2.17	0.04[a*]	0.244
Alienation, *Mdn (IQR)*	10.00 (22.00)	8.00 (22.00)	-2.24	0.02[b*]	0.244
Stress*, M (SD)*	24.27 (8.04)	20.53 (7.44)	2.36	0.03[a*]	0.341
Mindfulness*, M (SD)*	127.80 (20.38)	134.87 (16.79)	-1.50	0.15[a]	0.268
Observing, M (SD)	25.13 (5.38)	26.40 (5.28)	-0.88	0.39[a]	0.168
Describing, M (SD)	26.87 (3.42)	27.27 (2.25)	-0.50	0.62[a]	0.098
Acting with awareness, *Mdn (IQR)*	25.00 (24.00)	29.00 (12.00)	-1.08	0.28[b]	0.304
Non-judging, M (SD)	29.07 (7.25)	30.87 (5.89)	-1.59	0.13[a]	0.193
Non-reactivity, M (SD)	20.80 (4.17)	22.47 (4.30)	-1.96	0.07[a*]	0.279

Note. N= 15. *M (SD)*: mean (standard deviation), *Mdn (IQR):* median (interquartile range).* p<0.05; ** p<0.01. [a] t-Student (*t*); [b] Wilcoxon (*Z*)

Table 2.

Descriptive Results and Means Comparison of Pre and Post for the Control Group (CG).

	PRE	**POST**	***t/U***	***p-value***	***Hedge's d/g***
Anxiety, *Mdn (IQR)*	7.00 (12)	7.00 (8)	-0.10	0.91[b]	0.00
Depression, *M (SD)*	3.75 (2.12)	4.13 (3.6)	-0.32	0.75[a]	0.091
Work-related acceptance and action, *M (SD)*	35.75 (5.06)	33.88 (5.46)	0.87	0.40[a]	0.251
General self-efficacy, *M (SD)*	32.25 (3.10)	32.13 (2.47)	0.14	0.89[a]	0.030
General Work well-being (qBLG)					
Affect, *Mdn (IQR)*	53.50 (37)	55.50 (32)	-1.40	0.16[b]	0.194
Skills, *Mdn (IQR)*	56.00 (31)	58.00 (42)	-0.50	0.61[b]	0.026
Expectations, *M (SD)*	113.75 (25.71)	111.00 (5.70)	0.58	0.57[a]	0.104
Somatization, *M (SD)*	11.00 (5.70)	12.63 (3.73)	-1.41	0.20[a]	0.239
Exhaustion, *M (SD)*	15.00 (6.43)	14.88 (4.64)	0.06	0.94[a]	0.015
Alienation, *M (SD)*	10.75 (3.80)	12.13 (6.31)	-1.23	0.25[a]	0.187
Stress, *M (SD)*	21.75 (9.22)	21.50 (10.05)	0.12	0.90[a]	0.018
Mindfulness Total, *M (SD)*	134.63 (23.86)	138.38 (27.90)	-1.22	0.26[a]	0.102
Observing, *M (SD)*	27.63 (4.10)	27.50 (8.5)	0.06	0.94[a]	0.014
Describing, *M (SD)*	27.75 (6.96)	28.50 (5.26)	-0.67	0.52[a]	0.086
Acting with awareness, *Mdn (IQR)*	33.00 (24)	36.00 (27)	-1.16	0.24[b]	0.123
Non-judging, *M (SD)*	26.88 (7.06)	27.13 (7.41)	-0.09	0.92[a]	0.024
Non-reactivity, *M (SD)*	22.13 (4.79)	23.88 (3.35)	-1.43	0.19[a]	0.029

Note. N= 8. *M (SD)*: mean (standard deviation), *Mdn (IQR):* median (interquartile range). * p<0.05; ** p<0.01. [a] t-Student (*t*); [b] U Mann-Whitney (*U*)

Table 3.

Comparison of Pre-Intervention Means Between the Intervention Group (IG) and Control Group (CG)

	IG	**CG**	***t/U***	***p-value***
Anxiety, *M (SD)*	9.75 (3.45)	7.88 (3.94)	1.01	0.32[a]
Depression, *M (SD)*	6.38 (3.42)	3.75 (2.21)	1.84	0.08[a]
Work-related acceptance and action, *M (SD)*	31.00 (4.23)	35.75 (5.06)	-2.04	0.06[a]
General self-efficacy, *Mdn (IQR)*	30.00 (13)	33.50 (9)	-1.64	0.10[b]
General Work well-being (qBLG)				
Affect, *M (SD)*	47.13 (13.71)	49.13 (11.78)	-0.31	0.75[a]
Skills, *Mdn (IQR)*	49.50 (28)	56.00 (31)	0.00	1.00[b]
Expectations, *M (SD)*	92.00 (25.46)	113.75 (19.81)	-1.90	0.07[a]
Somatization, *Mdn (IQR)*	14.50 (18)	9.50 (17)	-1.48	0.13[b]
Exhaustion, *M (SD)*	19.38 (4.13)	15.00 (6.43)	1.61	0.12[a]
Alienation, *Mdn (IQR)*	12.50 (22)	9.50 (10)	-1.10	0.26[b]
Stress, *M (SD)*	27.63 (6.43)	21.75 (9.22)	1.47	0.16[a]
Mindfulness Total, *M (SD)*	120.88 (13.74)	134.63 (23.86)	-0.37	0.71[a]
Observing, *M (SD)*	23.50 (4.69)	27.63 (4.10)	-1.87	0.08[a]
Describing, *M (SD)*	27.13 (3.83)	27.75 (6.96)	-0.22	0.82[a]
Acting with awareness, *M (SD)*	23.75 (6.60)	30.25 (7.83)	-1.79	0.09[a]
Non-judging, *M (SD)*	27.63 (6.39)	26.88 (7.06)	0.22	0.82[a]
Non-reactivity, *M (SD)*	18.88 (2.53)	22.13 (4.79)	-1.69	0.11[a]

Note. IG, intervention group; CG, control group. N= 8. *M (SD)*: mean (standard deviation), *Mdn (IQR):* median (interquartile range). * p<0.05; ** p<0.01. [a] t-Student (*t*); [b] U Mann-Whitney (*U*)

Table 4.

Comparison of Post-Intervention Means Between the Intervention Group (IG) and Control Group (CG)

	IG	**CG**	***t/U***	***p-value***
Anxiety, *M (SD)*	7.88 (2.99)	7.88 (3.27)	0.00	1.0[a]
Depression, *M (SD)*	3.38 (2.13)	4.13 (3.68)	-2.04	0.62[a]
Work-related acceptance and action, *M (SD)*	33.75 (4.23)	33.88 (5.46)	-0.05	0.96[a]
General self-efficacy, *Mdn (IQR)*	30.50 (14)	32.00 (7)	-0.53	0.59[b]
General Work well-being (qBLG)				
Affect, *M (SD)*	49.63 (12.82)	51.50 (11.31)	-0.31	0.76[a]
Skills, *Mdn (IQR)*	57.00 (33)	58.00 (42)	-0.10	0.91[b]
Expectations, *M (SD)*	98.63 (25.56)	111 (25.713)	-0.96	0.35[a]
Somatization, *Mdn (IQR)*	12.00 (18)	13.00 (12)	-0.79	0.42[b]
Exhaustion, *M (SD)*	18.50 (5.85)	14.88 (4.64)	1.37	0.19[a]
Alienation, *Mdn (IQR)*	11.50 (22)	12.00 (16)	-0.26	0.79[b]
Stress, *M (SD)*	22.50 (7.52)	21.50 (10.05)	0.51	0.82[a]
Mindfulness Total, *M (SD)*	134.13 (15.93)	138.38 (27.90)	-0.37	0.71[a]
Observing, *M (SD)*	26.63 (6.52)	27.50 (8.58)	-0.23	0.82
Describing, *M (SD)*	28.00 (2.13)	28.50 (5.26)	-0.24	0.80[a]
Acting with awareness, *M (SD)*	27.25 (4.74)	31.38 (9.48)	-1.10	0.29[a]
Non-judging, *M (SD)*	31.00 (3.96)	27.13 (7.41)	1.30	0.21[a]
Non-reactivity, *M (SD)*	21.25 (4.33)	23.88 (3.35)	-1.35	0.19[a]

Note. IG, intervention group; CG, control group. N= 8. *M (SD)*: mean (standard deviation), *Mdn (IQR):* median (interquartile range). * p<0.05; ** p<0.01. [a] t-Student (*t*); [b] U Mann-Whitney (*U*)