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The effectiveness of the intervention based on acceptance and commitment therapy (ACT) among older adults.

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Doctoral dissertation

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SUMMARY

Background. Epidemiological studies among older adults have demonstrated high rates of subclinical anxiety and depression. This is accompanied by increased distress related to ageing and everyday life challenges, thus affecting wellbeing and increasing the risk of developing full mental disorders. This also highlights the need for psychological interventions to focus on mental health and improve wellbeing in this population in compliance with the Model for Sustainable Mental Health framework. In the current thesis the author proposes acceptance and commitment therapy (ACT) as an evidence-based transdiagnostic model of mental health promotion, protection and treatment to address this need. Although the research concerning effectiveness of ACT among older adults is scarce, the existing evidence supports its effectiveness in this age group.

Aim and primary hypotheses. The overarching scientific aim of the dissertation was evaluating the effectiveness of an original intervention based on the ACT model among older adults in Poland. This aim was achieved by analysing the data from two separate cluster randomised controlled trials. The effectiveness of the training was operationalized as lowering the level of psychopathological symptoms (depression/ anxiety/ psychological stress) and/or increasing the quality of life between two measurements – the baseline and after the participation in the intervention or after the time lapse.

Methods & results. All of the volunteers were recruited at the centres of daily care for older people. The participants lived in rural areas and small towns, with minimal or no opportunities to obtain psychological support. In the first study, a total of 60 older adults took part in the research and were randomised either to a 4-week ACT-based intervention or to an inactive control group. In the second study, the total of 100 older adults were included in the research and randomised to either a 12-week ACT-based training programme or to a control group that participated in Positive Psychology Intervention (PPI). The ACT interventions in

both studies were identical, but the time of delivering the programme was prolonged in study 2. The statistical analyses showed that ACT intervention increased quality of life in both studies and decreased psychopathological symptoms in the first study. There were also significant decreases in anxiety level among participants with elevated levels of these symptoms at baseline measurement in the second study among participants exposed both to the PPI component and ACT intervention. Although in the first study the ACT processes were not detected as the mediators of change, the increases in psychological flexibility, acceptance, defusion, and contact with the present moment were statistically significant mediators in the relationship between group membership and increased quality of life in the second study. Additionally, the level of cognitive functioning measured by MMSE was not the moderator of change in psychopathological symptoms and quality of life in the first study, which suggests that ACT interventions may be implemented regardless of the cognitive functioning of older adults.

Conclusion. The ACT-based intervention was effective in lowering the psychopathological symptoms and in quality of life enhancement as compared to inactive control group (study 1) and in increasing quality of life in comparison to PPI (study 2). Thus, the ACT intervention should help address the issues of mental health and wellbeing in older adults. The training programme based on ACT increased the quality of life for participants in line with the WHO agenda concerning support for older adults, thus reflecting the conditions outlined in the Model for Sustainable Mental Health. No study has yet evaluated the effectiveness of ACT-based interventions in Poland. The current research makes a significant contribution to the literature in this domain. The results of the current research provide evidence supporting introducing ACT-based interventions into prevention programmes and can suggest multiple pathways by which the intervention can be delivered to older adults.

STRESZCZENIE

Kontekst badania. Badania epidemiologiczne wśród starszych osób wykazały wysoki poziom subklinicznego lęku oraz depresji. Tym objawom towarzyszył podwyższony poziom stresu związany z procesem starzenia się oraz wyzwaniami dnia codziennego, które to z kolei miały wpływ na ogólne samopoczucie oraz podwyższały ryzyko rozwinięcia pełnoobjawowych chorób psychicznych. Zatem widoczna jest potrzeba psychologicznych interwencji skoncentrowanych na zdrowiu psychicznym i poprawie dobrostanu wśród tej populacji zgodnie z Modelem Zrównoważonego Zdrowia Psychicznego (Model of Sustainable Mental Health, MSMH). W niniejszej pracy Autorka proponuje terapię akceptacji i zaangażowania (Acceptance and Commitment Therapy, ACT) jako skuteczną metodę opartą na transdiagnostycznym modelu profilaktyki, ochrony i leczenia. Pomimo iż badania nad działaniem terapii ACT wśród osób starszych są nieliczne, aktualnie istniejące dowody świadczą, iż metoda ta jest skuteczna wśród omawianej populacji.

Cel oraz hipotezy badawcze. Nadrzędnym celem naukowym niniejszej rozprawy była ocena skuteczności interwencji opartej na modelu ACT wśród osób starszych w Polsce. Ten cel został osiągnięty dzięki analizie danych z dwóch oddzielnych badań z randomizacją oraz grupami kontrolnymi.

Operacjonalizując skuteczność terapii przyjęto, że jej wskaźnikiem będzie zmniejszenie objawów psychopatologicznych (depresji/ lęku/ stresu psychologicznego) i/lub zwiększenie jakości życia w drugim pomiarze, przeprowadzonym po interwencji psychologicznej lub po upływie określonego czasu.

Metoda oraz wyniki. Wszyscy ochotnicy uczestniczący w badaniu pochodzili z dziennych ośrodków opieki nad starszymi osobami i zamieszkiwali tereny wiejskie oraz mniejsze miasta. Posiadali oni zerowe lub minimalne szanse na otrzymanie psychologicznego wsparcia. W pierwszym badaniu wzięło udział 60 starszych osób, które losowo przydzielono

do 4 tygodniowego programu pomocy opartego na założeniach ACT lub do grupy kontrolnej, która nie została poddana żadnym oddziaływaniom. W drugim badaniu wzięło udział 100 starszych osób, które losowo przydzielono do 12 tygodniowego programu opartego na przesłankach ACT lub do grupy kontrolnej, której członkowie zostali poddani interwencjom opartym na założeniach Psychologii Pozytywnej (PPI). Interwencja oparta na założeniach ACT przebiegała w obu badaniach identycznie, jedynie czas trwania interwencji był dłuższy w drugim badaniu. Analizy statystyczne wykazały, że udział w procedurach ACT podwyższył jakość życia osób badanych w obu badaniach oraz zmniejszył objawy psychopatologiczne w badaniu pierwszym. W badaniu drugim odnotowano statystycznie istotny spadek symptomów lękowych w grupie osób, które w pierwszym pomiarze miały podwyższony poziom lęku zarówno w grupie poddanej interwencji Psychologii Pozytywnej (PPI), jak i oddziaływaniom opartym na ACT. W badaniu pierwszym nie stwierdzono, by mechanizmy zmiany kluczowe w ACT były mediatorami zmian w poziomie symptomów psychopatologii i jakości życia. Natomiast w badaniu drugim zmiany w poziomie elastyczności psychologicznej, akceptacji, defuzji oraz uważności stanowiły istotne mediatory wzrostu jakości życia między pomiarami. Dodatkowo, poziom funkcjonowania poznawczego mierzonego skalą MMSE nie był moderatorem zmian w poziomie objawów psychopatologicznych oraz jakości życia w badaniu pierwszym. To sugeruje, że metoda ACT może być stosowana bez względu na poziom funkcjonowania poznawczego osób starszych.

Wnioski. Interwencja psychologiczna oparta na modelu ACT okazała się być efektywna w obniżeniu objawów psychopatologicznych oraz podwyższeniu jakości życia w porównaniu do grupy kontrolnej, która nie została poddana żadnym oddziaływaniom (badanie 1). Interwencja oparta na ACT okazała się również efektywna w podwyższeniu jakości życia w porównaniu do grupy kontrolnej, która uczestniczyła w interwencji opartej na Psychologii Pozytywnej, a w której nie odnotowano zmiany w poziomie jakości życia (badanie 2).

Podsumowując, interwencje oparte na modelu ACT mają potencjał, by być pomocne we wspomaganiu zdrowia psychicznego oraz jakości życia u osób starszych. Program treningowy utworzony na podstawie modelu ACT wpłynął na polepszenie jakości życia uczestników programu, co jest spójne z zaleceniami WHO, dotyczącymi metod wspierania osób starszych, tym samym potwierdzając przesłanki zawarte w Modelu Zrównoważonego Zdrowia Psychicznego (MSMH). Jest to pierwsze badanie w Polsce dotyczące oceny skuteczności interwencji opartych na założeniach terapii ACT. Niniejsze badanie stanowi cenny wkład w literaturę tematu. Wyniki badania dostarczają argumentów na korzyść włączenia terapii ACT do programów profilaktycznych zdrowia psychicznego. Mogą również stanowić dobry punkt wyjścia dla wdrażania tych interwencji wobec osób starszych.

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I dedicate this dissertation to all Women so as they never give up, pursue their inner values and find self-fulfilment at every stage of life - also after they turn 60 years old.

CONTENTS

"Today, most people, even in the poorest countries, are living longer lives. But this is not enough. We need to ensure these extra years are healthy, meaningful and dignified. Achieving this will not just be good for older people, it will be good for society as a whole."

Dr Margaret Chan (2015)

Director-General of WHO

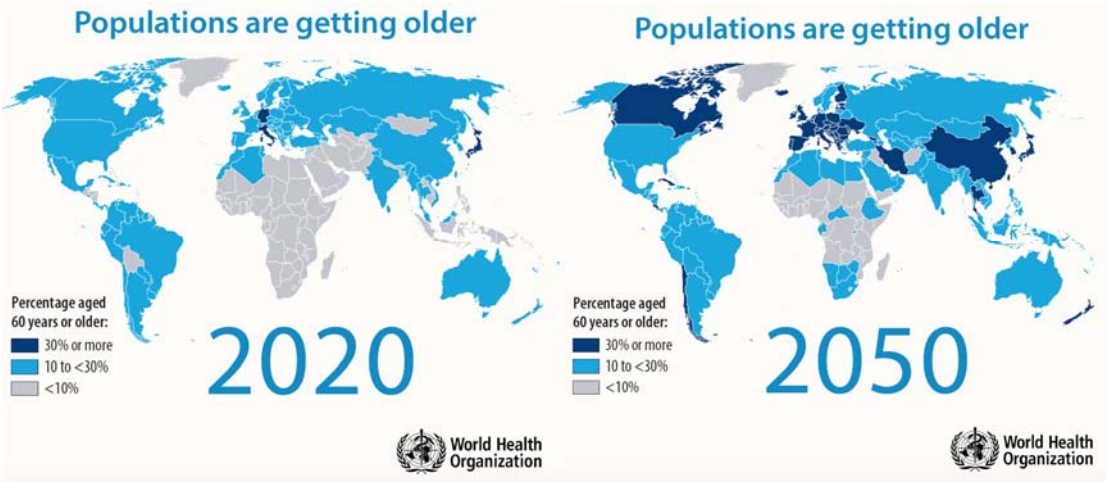
(retrieved from https://www.who.int/news/item/30-09-2015-who-number-of-people-over-60-years-set-to-double-by-2050-major-societal-changes-required, 2022)

1. INTRODUCTION

Nowadays, for the first time in history, most people in the world can expect to live 60 years and longer. Increases in life expectancy and falling fertility rates lead to the rapid ageing of populations all around the world (Beard et al., 2017; WHO, 2019). Societies are getting older and more and more people are living long lives. Our understanding of the processes, restrictions and challenges connected with ageing is crucial to create and implement the support initiatives which aim at fostering the well being of this age group (WHO, 2020).

Figure 1

The Percentage of Older Adults in Year 2020 and in the Forecast for the Year 2050



Note. Retrieved from https://www.who.int/ageing/events/world-report-2015-launch/populations-are-getting-older-full.gif?ua=1, 2020)

Modern societies are the most safe, the healthiest and the most prosperous throughout human history. Unprecedented life expectancy and economic security does not protect from the prevalence of human suffering and accompanying psychopathological symptoms. The aging populations deserve increased attention due to their vulnerability connected with numerous challenges exemplified in deterioration in physical health, cognitive decline, loss of roles, family members, friends, financial and social status etc. (Chatterji et al., 2015; Von Hecker et al., 2006; Fiske, Wetherell, & Gatz, 2009; Knight & Pachana, 2015, Bidzan, 2017).

Difficult emotions are the crucial part of life and development, however, when their level is elevated for a long period of time, it may lead to development of mental disorders. Additionally, the prevalence of subthreshold psychopathological symptoms affects the wellbeing of older adults. Alas older people experience obstacles with receiving proper psychological support and remain an underserved population. The need emerges for initiatives recognizing that combating mental illness might best be achieved by prevention methods (McDaid, Hewlett, & Park, 2017; OECD, 2021; Saxena, Jané-Llopis, & Hosman, 2006; Biglan, Hayes, & Pistorello, 2008).

The intervention based on the premises of the acceptance and commitment therapy (ACT) posits a feasible model of supporting mental health and wellbeing of older adults.

ACT constitutes an evidence-based model of psychological treatment (Hayes et al., 2006). The approach is based on the concept of psychological flexibility defined as the ability to contact the present moment without unnecessary defences, in the actual situational context in order to change or to persist in behaviour that is consistent with one's goals or values. In the ACT model, psychopathology and lowering of the quality of life are being interpreted as the effects of psychological inflexibility, that is a permanent rigid pattern of reacting to internal experiences, which leads to restricting the spectrum of behaviours and the possibility to obtain reinforcement from outside. According to the ACT model, mental disorders, including anxiety disorder and depression, can be caused by the fixed prolonged avoiding of various experiences – experiential avoidance. The ACT model is in line with a transdiagnostic approach whose aim is to foster psychological processes which disturbed can lead to different types of mental disorders. This kind of attitude towards mental functioning is especially recommended for older people whose anxiety and depression symptoms are very often comorbid (Gum, Cheavens, 2008). The ACT model is also in line with the Model for

Sustainable Mental Health (Bohlmeijer & Westerhof, 2021) as it covers interventions that target barriers and foster adaptation resources (Hayes et al., 2011).

The growing body of research confirms the efficacy of ACT in a variety of health and psychological problems, however the studies on the effectiveness of ACT-based interventions in the groups of older people are scarce and there were no randomised controlled trials performed in Poland yet. The existing studies showed promising results in lowering the level of depression and anxiety and improving the quality of life (Witlox et al., 2021; 2022; Wetherell et al., 2011; Davison et al., 2017; Alonso-Fernández et al., 2013; 2016), so the need for further exploration of this area emerges.

This project investigates the effectiveness of ACT-based intervention among older people in Poland in decreasing the psychopathological symptoms and increasing the quality of life. The research fills the research gap, as the research concerning the application of such interventions among older adults is scarce yet promising.

An additional advantage of these studies was that they reached residents of villages and small towns, who lived considerable distances from mental health support centres. In this regard, the participants represented members of Polish society who remain underserved in areas of mental health support. The participants of the current research attended the daily care homes, which offered care for older adults unable to function independently. The attendance to these kinds of places was limited to persons who were at risk of social exclusion due to living alone, suffering from chronic medical conditions or disabilities, or struggling with difficult financial situations. In the current study there were no barriers to participation by persons with physical disabilities and mild sensory impairments.

The project comprises two separate cluster randomised controlled trials. To date, these studies pertain to the first cluster randomised controlled trials investigating the effectiveness of ACT-based intervention in Poland.

“It’s not how old you are, it’s how you are old.”

— Jules Renard

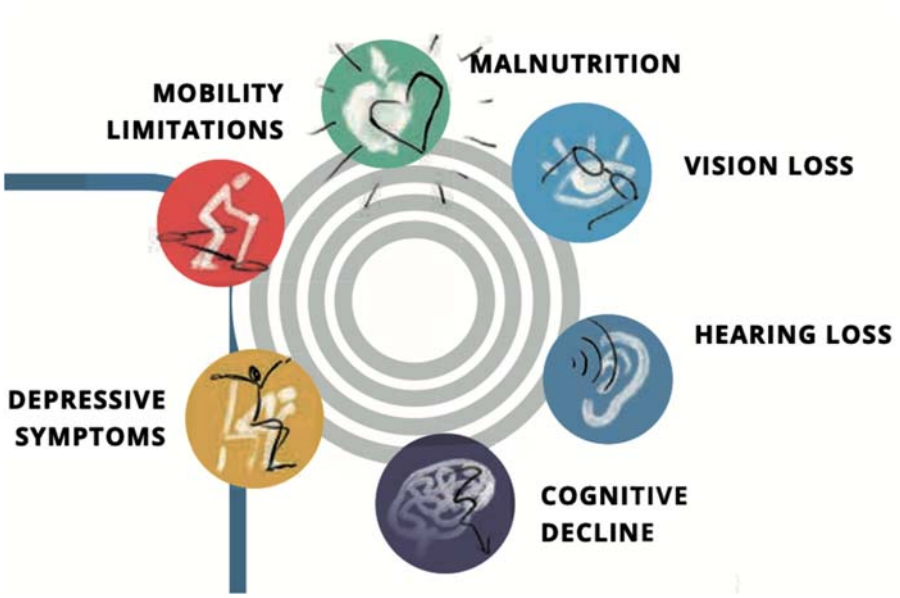
2. AGEING

2.1. General framework

Aging is a complex, multi-faceted normative experience of humankind. It is a process that comprises multilevel physical, cognitive, psychosocial, cognitive and spiritual changes.

Figure 2

Declines in Capacities Associated with Ageing Processes



Note. Retrieved from https://www.who.int/ageing/health-systems/icope/en/

Arguably, thus far, there is no universal definition of ageing that embraces all the features and processes of this life stage. The existing ones are created depending on either chronological, biological, psychological or cultural perspective. Ageing can be conceptualised as processes affecting a person as a consequence of his or her development (Stuart-Hamilton, 2012) and divided into past events known as distal effects of ageing, and present-day situations, defined as proximal effects of ageing. Aging can also be described as the probability of representing particular characteristics of an old age (Johnson, 2005). The universal features of ageing comprise of those characteristics which, to some extent, affect

universally all ageing people (primary ageing), while probabilistic features of ageing can likely occur but do not have to (secondary ageing). It is also impossible to indicate a starting point and a momentum of this phenomenon – the division line will always be arbitrary. For some scientists, especially those working in the field of cognitive psychology and neuroscience, ageing starts relatively early, as the age-related cognitive declines begin as early as when adults are in their 20s or 30s (Salthouse, 2009). A wide range of neurobiological variables are assumed to be linked to cognitive functioning. Evidence shows that some of these variables demonstrate continuous age-related deteriorations in cross-sectional comparisons, which commence when adults are in their 20s. These indicators are inter alia measures of regional brain volume (Wolf et al., 2004; Pieperhoff et al., 2008), myelin integrity (Lu et al., 2011; Boa Sorte Silva et al., 2022) or cortical thickness (Salthouse, et al., 2015; van Velsen et al., 2013; Pfefferbaum et al., 2005).

Although these data do not provide the definition of ageing and do not give the exact answer when ageing begins, it has both theoretical and practical implications. As the data suggest that the ageing process is gradual and begins quite early, the social attitude towards ageing and old people may gain a different perspective by realising that, to some extent, all adults are in the process of ageing. Chronological age assigned to the beginning of an old adulthood oscillates between 60-65 (Johnson, 2005). At this age the majority of people undergo significant physical and mental changes that affect their everyday functioning. Therefore, most gerontologists indicate the age of 60-65 as the onset or threshold age of becoming old (Segal, Qualls, & Smyer, 2018; Pachana, 2021). The same threshold age is adopted by the World Health Organization. According to the WHO agenda (2015), elderliness is a phenomenon that is connected with and caused by changes in physiology, biochemistry and anatomy of the body cells. These changes affect the cells' functioning. The entire process

begins at the age of 60. It is not a disease but a natural process of transformation that cannot be stopped or reversed.

2.2. **Biological perspective**

The process of growing old is apparent in physical, mental and cognitive functioning. The range of the changes differ significantly between people as far as physical and mental change is concerned and these differences are most pronounced in more advanced age (Stuart-Hamilton, 2012). Many older people are agile and vigorous at the late stage of a lifespan; however, a vast amount of people struggle with some kind of incapacity. These differences may be associated both by lifestyle and genetic factors. Biological ageing describes the state of development and physical degradation of the human body (Stuart-Hamilton, 2012). Modern biological theories of ageing can be divided into two main broad categories: programmed theories and damage theories (Jin, 2010).

The damage (error) theories (Hulbert et al., 2007; Jin, 2010; Ou & Schumacher, 2018) imply that ageing is the result of cumulative environmental damage caused by the onslaught of harmful chemicals. These theories include programmed longevity (ageing connected with switching on and off of genes), immunological theory (the immune system becomes insufficient with growing age and the vulnerable organism is prone to infectious disease and subsequently to ageing and death), endocrine theory (ageing is hormonally regulated). In the programmed theories it is assumed that ageing is determined by a biological timetable and regulations that rely upon gene expressions determining maintenance, repair and defence systems. These theories comprise of wear and tear theory (ageing as a consequence of wearing out of cells and tissues of an organism), rate of living theory (links ageing to organism's rate of oxygen basal metabolism), cross-linking theory (aging as a result of slowing down of bodily processes due to an accumulation of cross-linked proteins harmful to

cells and tissues), free radicals theory (cells and organs stop functioning due to the accumulated damage caused by superoxide and other free radicals), somatic DNA damage theory (ageing as a consequence of continuous DNA damages) (Jin, 2010). Another damage theory is the Hayflick limit theory of ageing (1985; 1994; 1997 after Stuart-Hamilton, 2012). The body cells are not immortal; they are being replaced by the new ones or lost over the period of about 7 years. The concept of apoptosis, that is the cells are pre-programmed to die is supported by the evidence of Hayflick phenomenon, which shows that the cells raised in vitro will only reduplicate themselves the limited amount of times, and the older the body from which the cell is collected, the less cell copies are being created before its death. One of the explanations of this phenomenon is the telomere theory. Telomeres are arts of DNA that are located at the end of chromosomes. It has been observed that each time a cell divides, the telomeres are becoming shorter and shorter (Campisi, 2000; Ferraro & Carr, 2021). When the telomeres shorten to a critical length, the cell cannot replicate at a required rate and subsequently dies off.

The age-related deterioration in the functioning of body systems is a consequence of changes both at a cellular (a loss in the efficacy of mitochondria) and molecular level (DNA damages, shortening of telomeres mentioned above). Deleterious decline is noticeable in urinary system, which becomes less effective in eliminating the toxin and other waste products of metabolism; in gastrointestinal system, which absorbs the nutrients less efficiently; the skin and muscles become less elastic and the decline in the muscle mass and strength appears; the respiratory system absorbs less oxygen; the cardiovascular system weakens and the circulation of blood is more energy-consuming due to losing strength by heart and the lowering of thickness and elasticity of arteries (Stuart-Hamilton, 2012). The aforementioned changes have a negative effect on the functioning of the brain and, consequently, on psychological functioning. Cardiovascular disease together with normal

elderly decline can affect cognitive functioning (Hof & Mobbs, 2010; Stuart-Hamilton, 2012). The often causa of brain damage in older people is the temporary deficiency of blood supply to some part of the brain, which is called the vascular-brain incident. The most frequent type of stroke is transient ischemic attack which is a temporary blockage of blood flow to the brain caused by the clogging of the artery by the thombus or different kind of barrier. Less frequent is hemorrhagic stroke which is a consequence of a weakened blood vessel that ruptures and causes bleeding into the surrounding brain. The accumulated blood compresses the surrounding brain tissue (Kalat, 2013). The post-stroke complications depend on its location and may include communication problems like aphasia, decreased attention, distractibility, the inhibition processes disruption and problem-solving ability. The brain is contacting the environment via senses, which are also susceptible to age-related decline (Stuart-Hamilton, 2012). The vast group of older people struggle with vision or hearing impairments or loss. Additionally, some constraints pertain to communication of older adults as a result of sensory impairments such as presbyopia or presbycusus (Kemper, 2012; Hof & Mobbs, 2010).

Some communication problems can arise from more subtle and difficult to detect changes such as limitations of inhibitory control, processing speed or working memory capacity. Senescence is also concurrent with major chronic health conditions, which means that older people are at relatively higher risk of suffering from one or more disorders that may result in declines in functioning. These kinds of conditions include inter alia high blood pressure (hypertension), diabetes, cancer, osteoporosis and many more (Schaie & Willis, 2010; Chatterji et al., 2015).

2.3. **Psychosocial perspective**

Psychological theories of aging have deepened the understanding of active and dynamic aspects of this phenomenon. In most cases they emphasise the proactive role of older adults in managing their own aging process.

Selection, Optimisation and Compensation (SOC) Theory (Baltes, 1997; Baltes & Baltes, 1990; Freund & Baltes, 1999) postulates three strategies for successful aging: selection, optimisation and compensation. Selection in the SOC model embraces developing, elaborating, and committing oneself to personal goals and enables directing current resources on a limited repertoire of life domains in which a person can succeed. The goals need to be restructured due to normative changes in life circumstances and personal resources. Selection process enables older adults refocusing behaviours to be consistent with flexibly altering goals across their lifespan. The process of reordering priorities is essential to be accomplished by an aging person in a proper moment in order to avoid struggle without reward of accomplishment (Lazarus & DeLongis, 1983). Optimisation refers to the acquisition, refinement, and application of goal-oriented resources, abilities and strategies in order to achieve the established goals. Compensation in the SOC model takes into account the limitations and barriers, which hinder achieving the goal (Baltes, 1997; Freund et al., 1999). Older adults prioritise behaviours that maximise quality of life and they use strategies to compensate for the declines to fulfil their needs. They tend to engage in growth or gain, maintaining functioning or minimising losses goals depending on the availability of resources (Ebner, Freund & Baltes, 2006).

Socioemotional Selectivity Theory (SST; Carstensen, 1992, Carstensen et al., 2003) explains the selection processes in both social and psychological domains due to limited time perspective. The social interaction patterns change across the life span. In late adulthood, the perspective of time changes and the emotional goals that are in congruence with the values

become more salient. Older adults focus their attention rather on more emotionally meaningful goals than on future-oriented long-term goals (Fung & Carstensen, 2006).

Social life has potential to bring social and emotional gains and risks. Older adults actively and adaptively limit their social networks to significant others to optimise the gains from social interaction (Carstensen, 1992; Carstensen et al., 2003). This process enables older adults to cultivate their social network and to concentrate the limited energy on important persons (Fung & Carstensen, 2006).

Erikson's stage theory of lifespan development (Erikson, 1980) acknowledges maturation as a consequence of developmental process. According to Erikson's theory, maturation is an ongoing process occurring throughout one's lifespan. The successful resolution of predictable age-graded developmental crises constitutes a basis for emerging of a virtue, which is essential to cope with forthcoming life challenges. The final stage of lifespan development, characterised as old age, constitutes a momentum of viewing lifespan experiences as being productive and valuable or disappointing. The developmental crisis for a person in the stage of old age, integrity versus despair, if solved positively, can be the source of integrity, peace of mind and a sense of appreciation for a fulfilled life. Integrity is also a basis for overcoming the death anxiety, which appears at the end of a life-span. In case of a positive solving of the crisis, the older person evinces the virtue of wisdom as an ability to set goals and appreciate the meaning and value of human life.

The term Positive Ageing has been coined on the basis of Positive Psychology (Csikszentmihalyi & Seligman, 2000) in which the subjective experience of well-being, contentment and satisfaction together with hope and optimism for the future are of crucial importance and value. Positive ageing model accentuates modifying the ageing experience with the use of available resources in order to make the process fulfilling and satisfying. The central view in this model is the possibility to optimise one's own ageing experience (Hill,

2005). An old person can act proactively regardless of deficits, barriers, losses and declines in order to enhance the quality of living. The Positive Ageing model is a framework for acknowledging both the challenges, barriers and difficulties connected with ageing but, first of all, emphasising opportunities and the role of individual choice of approach to one's own ageing process. The general characteristics of positive ageing comprise of (1) mobilising resources to cope with age-related deterioration; (2) making lifestyle choices to preserve well-being; (3) cultivating flexibility across the lifespan and (4) focusing on the positives instead of the problems and decline connected with growing old (Hill, 2005).

The aforementioned psychological theories of ageing, although different, share essential common characteristics. Firstly, as it was stated before, all of them emphasise the proactive role of an individual in the process of ageing. Secondly, they can be interpreted as explaining the processes of psychosocial adaptation to changes connected with ageing. The Selection, Optimisation and Compensation Theory (Baltes, 1997) embraces processes that enable an ageing person to interact with psychosocial challenges in a way that gives prospects for a sense of satisfaction and achievement despite the present obstacles, losses and barriers. In Socioemotional Selectivity Theory (Carstensen, 1992) the adaptation processes to changing time perspective play a key role in redirecting attention to relying on emotion-focused strategies and employing distancing and positive reappraisal in face of numerous challenges. Older adults adapt to inevitable losses encountered in old age via greater emotional control which enables them to experience life satisfaction (Carstensen et al., 2003). Positive Ageing model (Csikszentmihalyi & Seligman, 2000) emphasises that adaptation processes may be fostered by pursuing well-being through employing a person's resources and positive perspective taking (Hill, 2005). Erikson's stage theory of lifespan development (Erikson, 1980) accentuates the sanity of virtue of wisdom, which enables focusing on priorities in an individual's life.

The psychological theories mentioned above incorporate adaptation processes into the understanding of the nature of successful ageing.

The senescence brings forth the necessity to cope with a new kind of tasks and problems. The stress connected with ageing triggers the change of life's priorities. Physiological well-being, sense of security, spirituality, family bond and the need to sustain the activeness and stimulation become one's priorities (Thompson et al., 1990; Connidis, 2005; Marcoen, 2005; Pachana, 2021; Brandtstädter & Rothermund, 2002; Segal et al., 2008; Heisel et al., 2016). Older adults struggle inter alia with financial problems, limited mobility and ability to perform everyday duties; with technological barriers; with difficulties in family relations; with architectural barriers and the necessity to move houses; with negative life recapitulation and subsequently lowering of self-esteem, lack of acceptance of one's fate and the sense of loneliness (Schaie & Willis, 2010; Branch & Jette, 1981; Owczarek, 2017; George, 2005).

The aforementioned factors can lead to depressive complications such as the sense of hopelessness and deterioration of one's mental skills (Von Hecker et al., 2006; Fiske, Wetherell, & Gatz, 2009; Knight & Pachana, 2015, Pachana, 2021; Bidzan, 2017). The impairments connected with ageing caused by the central nervous system diseases (e.g. Alzheimer disease, Parkinson disease, dementia), strokes, the orthopaedic disabilities, cancer and many other chronic conditions pose challenges both for older people and for their caregivers. Older people need to transform from someone independent to someone dependent on others. This situation can be a source of uncertainty and anxiety (George, 2005; Larsson et al., 2005; Blazer, & Hybels, 2005; Sharma, Chakrabarti & Grover, 2016; Blazer et al., 2005; Barry et al., 2012; Bryant, Jackson, & Ames, 2008; Wolitzky-Taylor et al., 2010; Gallacher et al., 2009).

One further issue causing distress in older people is the change of time perspective observed among older adults (Desmyter, & De Raedt, 2012; Pethtel, Moist, & Baker, 2018). Existential problems including death, loneliness and uncertainty of the future can induce existential anxieties, which in turn can be the source of pain and suffering for older people (Yalom, 1980). The arrival of the last stage of life brings forth the thought about the end of existence which becomes something real and proximal (De Walden-Gałuszko, 2017; Depaola et al., 2003). For some older people, the new time perspective is difficult to bear; they chaotically try to catch up with all the life plans and they behave in a way that is not adjusted to their needs. Their activity is more a manifestation of the senescence anxiety rather than a mission to accomplish and organise things that are important in their lives (Brinkman-Stoppelenburg, Rietjens, & Van der Heide, 2014; Steuden, 2014). The social networks shrink (Carstensen, Fung, & Charles, 2003). The ageing person may be socially excluded and may perceive oneself as redundant, as a burden for the family and society, which in turn may lead to avoiding people and withdrawing from social interactions and isolation (Pachana, 2021; Ferraro & Carr, 2021). The older person may experience the loss of life partner or/and friends which results in loneliness and, consequently, generates a sense of frustration, hopelessness and anxiety (Steuden, 2014; Ferraro & Carr, 2021; Gillies & Neimeyer, 2006).

Another concept, demanding attention of researchers, is related to motivational goals and age-related differences in resource management. A few existing theories underline the motivational and goal redirection in normative ageing and its impact on cognitive processes (Verhaeghen, 2022; Whatley et al., 2022). As it was mentioned above, in Socioemotional Selectivity Theory (Carstensen et al., 2003) the limited time perspective is considered crucial for focusing on more emotionally salient goals. The changing emotional goals in the lifetime induce changes in motivation, which can have an impact on allocation of cognitive resources in older age (Whatley et al., 2022).

Selective Optimisation and Compensation model (Baltes, 1997), discussed previously, also describes age-related changes in motivation and goals. According to this theory, as older adults experience a decline in resource availability (e.g. cognitive and physical functionality), they compensate for them by changing priorities and goals to optimise outcomes. Research confirms that older adults selectively allocate limited cognitive resources (e.g. attention) to stimuli that will bring the most optimal outcome, e.g. remembering the most important information, remembering three or four the most important items out of 10 (Castel, 2008; Siegel & Castel, 2018). In the domain of decision-making, older adults exploit more time to process information, search less information and use less cognitively advanced strategies than younger people. However, although older adults have fewer resources to allocate to the process, they adaptively adjust their expectations, goals and behaviours to reach an optimal decision (Mata et al., 2010). Older adults are more selective with their cognitive resources, especially in relation to subjectively salient information. Research incorporating the general paradigm for evaluating memory for information of varying importance - the value-directed remembering – showed that older adults as compared to younger generally prioritise recall of the subjectively highest-value items in relation to low-value item (Siegel & Castel, 2019; Swirsky & Spaniol, 2019). Evidence also suggests that remembering items, that can be incorporated to a general schema consistent with prior knowledge and expectations, is better remembered (Umanath & Marsh, 2014; Castel, 2005). This phenomenon is called schematic support and has been detected with a variety of stimuli (e.g. Castel, 2005; Mohanty et al. 2016). Schema-consistent information may be perceived as more meaningful than irrelevant or arbitrary information (Whatley et al., 2022).

There is a recent view that meaningfulness fosters memory performance in older adults (Skinner & Price, 2019). Additionally older adults exhibit preference for positively valenced information. As compared to younger adults, they prioritise positive emotional

information (Reed et al., 2014) in a number of tasks, which is called the positivity effect. The positivity bias in older adults is in line with aforementioned SST (Carstensen et al., 2003), which emphasises the role of emotional goals in later life. Older people remember positive past events better than negative regarding long-term autobiographical memory (Kennedy, Mather, & Carstensen, 2004) and tend to encode enhanced positive and reduced negative information in memory (Mather & Knight, 2005). The allocation of cognitive resources in the late adulthood towards positive information enables achieving short-term emotional goals, which is a base for improving their emotional well-being (Whatley et al., 2022). Motivational factors have implications for understanding the nature of cognitive ageing and should be taken into consideration when designing future research (Whatley et al., 2022). Older adults are capable of achieving goals despite limited resources and remember meaningful information.

A growing body of neuroscientific research confirms that the processes of neuroplasticity in the human brain are present across the lifespan (Hof & Mobbs, 2010; Kossut, 2018; Sędek, Hess & Touron, 2022). Adequate training can improve physical and psychical strength, personality strengths, cognitive functioning, behaviour plasticity and consequently improve older people's quality of life (Cozolino, 2017; Schaie & Willis, 2010; Mahncke, Bronstone, & Merzenich, 2006; Hof & Mobbs, 2010). Interventions based on meditation and mindfulness can be included into the domain of cognitive trainings (Verhaeghen, 2022; Zanesco et el., 2019; Jha et al., 2019), as there is evidence that they train both selective and sustained attention (Hasenkamp et al., 2012). Future research should also explore what mediating lifestyle or congenial factors can influence the age-related trajectories and pace of cognitive decline (Logie, Horne, Pettit, 2015).

2.4. **Cognitive perspective**

Common everyday observations and scientific literature on cognitive processes across the adult lifespan confirm that a wide range of cognitive abilities decline with age.

Older adults are less efficient in a variety of cognitive tasks than younger people even if the groups are matched on education and there are no proofs of neuropathology among older adults (Logie, Horne, Pettit, 2015). Ageing is related to significant changes in brain's anatomy, neurochemistry and functional dynamics. These lead to declines in sensory and motor functions and in numerous cognitive processes that limit independent functioning (Schaie & Willis, 2010).

Age-related deterioration in cognitive functions is associated with particularly early decline of the prefrontal cortex and the medial temporal lobe (Hof & Mobbs, 2010; McDonough & Allen, 2019; Sędek et al., 2022) which are related to executive function. Executive function refers to a "higher level" or "meta-" cognitive function that manages other more basic cognitive functions (Salthouse & Davis, 2006), the regulation of emotions and attention (Blair & Diamond, 2008) necessary for engaging in independent, purposeful, self-serving behaviour. Executive functioning includes a wide range of cognitive abilities such as the ability to self-monitor, plan, organise, reason, problem-solve and be mentally flexible (Lezak et al., 2012; Snyder et al., 2014). The scientific literature has shown that concept formation, abstract thinking and mental flexibility decline with age (Lezak et al., 2012). Executive functioning relies in large part on working memory (WM) processes. I will present the WM concept and WM sensitivity to ageing processes further in this chapter.

Concepts of crystallised and fluid intelligence are useful in depicting the paths of cognitive changes in older adults. According to Nisbett (2010) the general intelligence (g factor) consists of two components. The first is the fluid intelligence - the ability to solve original, abstract problems, in which the mind operations to be made do not need much of the

information accumulated during the lifespan about the surrounding world. The fluid intelligence appears in so called executive functions such as working memory, attention control and cognitive inhibition. The other aspect of general intelligence is the crystalized intelligence embracing the accumulated knowledge about the world and the learnt procedures concerning drawing conclusions about it (Lezak et al., 2012). The cross-sectional age differences on the fluid intelligence variables start when adults are in their twenties or thirties and the decline that begins at that time accelerates around age 50. With the variables connected with the crystalized intelligence, such the trend tends to increase over the lifetime (Verhaeghen, 2003; Verhaeghen, 2022; Harada et al., 2013; Hof & Mobbs, 2010; Nagel & Lindenberger, 2015).

The term working memory was coined by Alan Baddeley and Graham Hitch (Baddeley, 2012) as an attempt to present a more accurate model of STM and as an alternative to the short-term store in Atkinson and Shriffin's multistore memory model (Atkinson & Shiffrin, 1968). It is responsible for both short-term maintenance of the information and for manipulation of information. Working memory is a "complex interactive system that is able to provide an interface between cognition and action, an interface that is capable of handling information in a range of modalities and stages of processing" (Baddeley, 2012, p. 18). The importance of undisturbed functioning of WM cannot be overestimated. It is crucial for proper functioning in everyday life (Kemper, Herman & Lian, 2003).). Working memory has been postulated as a processing resource or a critical limiting factor that can determine negative age relations in a wide variety of cognitive tasks (Salthouse, 2015). The decline in working memory functioning is apparent in the advanced age (Kemper,Herman & Lian, 2003).; Verhaeghen, 2022).

There are many different explanations of the malfunction of WM connected with aging: decline in processing speed measured by reaction (response) time (Salthouse &

Skovronek, 1992; Salthouse, 1996; Shimamura et al., 1995; Verhaeghen, 2014), breakdown in inhibitory resistance (Hasher et al., 1997), declines in attentional control (Cowan, 1999), or working memory capacity (Verhaeghen, 2012; Murman, 2015). Regardless of the reasons behind the declines of WM, it may be the source of problems in everyday functioning. One of the most common complaints of older adults concerns forgetting people's names (Ossher et al., 2013). It is an example of declining associative memory – an ability to remember associative information, which demands binding two or more pieces of information (Hara & Naveh-Benjamin, 2015). As people age, they experience growing difficulty with the tasks, in which the information must be stored and either abstracted or transformed at the same time (Salthouse & Skovronek, 1992). There are also substantial age differences in working memory capacity (Verhaeghen, 2012).

Cognitive control can be studied under at least four aspects: coordinative ability, task switching resistance to interference, and memory updating (Miyake et al., 2000).

The research on the age-related differences in coordinative ability often uses the paradigm of dual-task. Verhaeghen (2012) reports a meta-analysis of 33 studies incorporating dual-task paradigm that included age as a design factor. The results showed the pattern that the coordination process was more significantly slowed down in a dual-task performance than the baseline processes involved in the low-coordination version of the different tasks. However, the age effect was relatively modest.

The metaanalysis of the research with the use of task switching paradigm (Verhaeghen & Cerella, 2002) showed the deterioration of this ability in older adults, which cannot be reduced to general slowing down and lowering of the WM capacity in ageing.

The deterioration in inhibitory processes connected with ageing may be translated into the difficulty in switching the attention from one task to another and being more susceptible to distraction, which can be problematic when performing the tasks which require stable

attention or difficulty with ignoring irrelevant information in the environment while focusing on goal-relevant information (Hof & Mobbs, 2010; Kemper, Herman, & Lian, 2003; Verhaeghen, 2022). Other researchers (Hasher et al., 1997) underline the role of individual differences in the ability of inhibition. Regardless of the mechanisms explaining the difficulties in inhibition, they cause obstacles in doing tasks of higher level. Thus the lowering of working memory capacity as a result of normative aging leads to lowering of normal cognitive functioning. Therefore the capacity of working memory acts as a mediator between normal cognitive aging and deterioration in higher level cognition (Oberauer, 2006).

Memory updating, which can be studied under the aspect of focus switching, is another age-sensitive aspect of WM. The research by Verhaeghen (2012) showed that the dynamics of the switching process was exquisitely preserved, which means that older adults are able to access working memory slots with the efficiency that is comparable to younger adults. However, in contrast to preserved dynamics, the age-related decline in accuracy took place. The availability of the items stored in these slots was limited as soon as the items were out of focus of attention.

At the same time it remains clear that there is also substantial variation in cognitive performance among individuals at every age, including older adults (Salthouse, 2006). Some researchers argue (Verhaeghen, 2022) that cognitive changes in aging are mainly quantitative in nature, and mostly not qualitative. Relying on the research in his lab, Verhaeghen (2022) proposes the concept of rescaling, hypothesising that older adults are not fundamentally different concerning cognitive processes from other adults, but the general rescaling effect plays a role. The data from his laboratory shows that deficits in WM in older adults in cross-sectional comparisons with younger participants may be due to perceptual/attentional imprecision caused by motivational efforts to compensate for perceptual processing. When the research participants were matched on the perceptual versions of the task, working

memory and executive control deficits were not found. Therefore, the tasks designed for detecting executive control decline, should take into consideration that this system functions within certain boundaries defined by limited working memory capacity in older adults (Verhaeghen, 2022; Oberauer, 2006).

In understanding cognitive ageing, it is also crucial to integrate Salthouse's view (1996), that monolithic interpretations of cognitive ageing are far too simplistic and that there remains the need to explore the kinds of cognition that are insensitive to ageing and explaining such state of affairs. Many aspects of cognition do decline with age, but there are several cognitive abilities that are relatively insensitive to the ageing process (Logie, Horne, Pettit, 2015).According to Logie, Horne and Pettit (2015) older healthy adults may generate levels of performance similar to younger adults when performing on certain tasks under some circumstances. For example, until advanced old age there is a subtle or no decline in verbal short-term memory. As it was outlined before, there are no or slight age-related dual-task cost when older people are not performing under time pressure, when tasks are chosen to require the use of different components of working memory and when the tasks are tailored to meet the abilities of a single participant (Logie, Horne, Pettit, 2015; Verhaeghen, 2022).

Summing up, the changes in cognition and working memory across lifespan are hypothesised to be partly attributable to changes in attention and/or perception. These cognitive changes might be indirectly influenced by distribution of cognitive resources between perceptual, attention and cognitive stages of processing (Verhaeghen, 2022).

2.5. Mental health and ageing

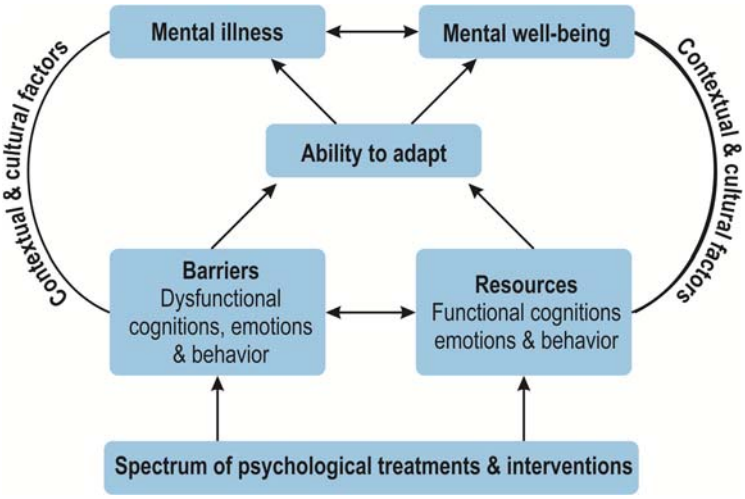
2.5.1. Model of Sustainable Mental Health

The consequences of the ageing process and numerous challenges it brings forth, which were described in the previous chapters, indicate that ageing is a phenomenon that is closely connected with mental health.

As the WHO agenda on Aging and Health (2015) accentuates the positive aspects of mental health, it is also consistent with the Model for Sustainable Mental Health (MSMH; Bohlmeijer & Westerhof, 2021). More specifically, the MSMH is based on the dual-continua model of mental health (Keyez & Lopez, 2002; Keyes, 2005; Westerhof & Keyes, 2010), which posits that mental illness and mental wellbeing are both related and distinct dimensions of mental health. Large-scale representative surveys and clinical trials have confirmed the applicability of the MSMH (Keyes, 2007; Westerhof & Keyes, 2010; Schotanus-Dijkstra, 2019; Trompetter et al., 2017; Franken et al., 2018). The model integrates the dual-continua conceptualisation of mental health with psychological treatment, thus guiding researchers and practitioners in heuristic treatment approaches that cover functional and dysfunctional components (Bohlmeijer & Westerhof, 2021). The model also includes contextual and cultural factors that are crucial for achieving and maintaining sustainable mental health. Figure 3 illustrates the components of the MSMH.

Figure 3

The Components of the MSMH



Note. With permission from Ernst Bohlmeier

Well-being is a multidimensional construct that embraces aspects of optimal experience and functioning (Ryan & Deci, 2001). The outline of theories of well-being was presented above. Herein, it is important to mention that the main perspectives in the research on well-being consist of the hedonic and eudaimonic approaches. The hedonic domain of well-being focuses on happiness and includes pleasure attainment and suffering avoidance, whereas eudaimonic well-being is characterised by meaning, self-realisation and purposeful living (Ryan & Deci, 2001).

Mental wellbeing in MSMH comprises emotional well-being (related to hedonic well-being); psychological well-being (related to eudaimonic well-being) and social well-being (related to societal aspects of eudaimonic well-being). The construct of well-being in this model reflects the components of the World Health Organisation's definition of good mental health which encompasses realising an individual's own potential, working productively, coping with stresses of life and making a positive contribution to community (WHO, 2022). The aforementioned definitions are also in line with the components of optimal or resilient

ageing (Aldwin, & Igarashi, 2015): functional health, life satisfaction, purpose in life and self-transcendence.

The central component of the MSMH is the ability to adapt. Optimal adaptation processes and well-being may be enhanced by the concurrent experience of positive and negative affect during difficult situations (Larsen et al., 2003; Tugade & Fredrickson, 2004), especially secondary mixed emotions (Braniecka et al., 2014). According to literature and research, older adults show high levels of adaptability (Freund, Li, & Baltes, 1999; Zautra & Reich, 2012). In compliance with SOC theory (Baltes, 1997), older adults compensate for the areas in which they have lost competencies by optimising the investment into their areas of competence. Thanks to the shift across adulthood from growth and gain to maintenance or prevention of loss, older adults may optimise the balance between gains and losses and preserve subjective well-being (Ebner, Freund, & Baltes, 2006). The SOC strategies were found to serve as buffers for the oldest old with low resources (Jopp & Smith, 2006).

The adaptation processes in this model are conceptualised as the processes that focus on maintaining equilibrium between an acceptance of suffering accompanied with relevant efforts to alleviate and prevent it, and meaningful living. Psychological flexibility process is proposed as a key adaptation process (Bohlmeijer & Westerhof, 2021).

According to MSMH, psychological treatments should address relevant barriers and resources needed for successful adaptation processes. The authors of the MSMH (Bohlmeijer & Westerhof, 2021) suggest that Positive Psychology Interventions (PPIs) and acceptance and commitment therapy (ACT) are congruent with the premises of the model.

Positive Psychology Interventions target mainly developing resources for adaptation. Positive Psychology Interventions focus on fostering positive emotions, cognitions and behaviours, which is in line with the framework of positive aging (Hill, 2005; Csikszentmihalyi & Seligman, 2000). Therein, individuals are encouraged to appreciate

simple things and positive events while experiencing and expressing gratitude towards others. They incorporate the building blocks of the PERMA model (Seligman, 2011): Positive Emotion, Engagement, Relationships, Meaning and Accomplishment. Interventions based on Positive Psychology are evidence-based treatment that can support mental health (Lambert et al., 2011; Algoe, Zhaoyang, 2016; Chaves et al., 2017; Lopez-Gomez, 2019; Leontopoulou, 2015). The Positive Psychology research confirmed the applicability of this treatment in fostering wellbeing (Seligman et al., 2005; Mongrain & Anselmo-Matthews, 2012; Bolier, Haverman, & Westerhof, 2013; Carr et al., 2021).

ACT interventions target both resources and barriers to adaptation and incorporate contextual and cultural factors. Due to aforementioned qualities, the ACT model fits into the MSMH. It constitutes a potentially effective intervention that may alleviate stress and psychopathological symptoms and promote well-being (White et al., 2017). The ACT- based interventions address also well-being, which is in line with the longitudinal evidence, that higher level of mental well-being reduces the risk of problematic mental health issues and mental disorders (Schotanus-Dijkstra et al, 2017; Keyes, Dhingra, & Simoes, 2010; Grant, Guille, & Sen, 2013; deVos et al., 2018; Franken et al., 2018). Thus addressing fostering well-being through building psychological flexibility in ACT-based interventions is indirectly influencing the issues connected with psychopathology.

The core processes embedded in the ACT model also have a potential of reestablishing personal control over life. For example, the process of committed action (Hayes et al., 1996), which is of high value for older adults in the face of age-related losses and constraints. The classic study of Reich, Newsom, & Zautra (1996) among older adults with physical disability or conjugal bereavement, found that a sense of personal control over events was connected with positive mental health and adaptation. It is commonly agreed across literature that sense of control in late adulthood is highly adaptive (Infurna, Gerstorf, & Zarit, 2011; Skaff, 2007).

As Positive Psychology Intervention targets mainly resources for adaptation, ACT-based intervention is broader in the scope of effect as it targets not only resources for adaptation, but also barriers such as dysfunctional patterns in the form of experiential avoidance and cognitive fusion. The ACT model embraces the pathological aspects of experience, focusing at the same time at promoting well-being (White et al., 2017). Summing up, ACT-based intervention has a potential to be implemented in the promotion, protection and restoration of mental health.

2.5.2. **Ageing and mental treatment gap**

Mental health issues are present across the lifespan, although the prevalence rates decrease in the adult lifespan and specifically among the late-life age population (Hill, 2005; Reynolds et al., 2015; Witlox, 2021). The growing body of epidemiological research confirms that anxiety disorders and depression are among the most common mental health problems in older people (Alexopolous & Kelly, 2009; Witlox et al., 2021; Pachana, 2021). Depression and anxiety in older adults very often manifest with cognitive declines (Shimada et al., 2014). About half of older adults diagnosed with depression suffered from the first onset of the disorder in later life, which used to be called late-onset depression (Fiske, Wetherell, & Gatz, 2009).

When assessing the prevalence rates of psychopathological disorders among older adults, it is important to include such issues as comorbidity of mental disorders (Bobo et al., 2022) and prevalence rates for subsyndromal manifestations of disorders.

The meta-analysis of data from 87 studies across 44 countries (Baxter et al., 2013) reported that anxiety disorders were ubiquitous among older adults across cultures and more common than depression in older adults. The prevalence estimates for depression in older adults showed relatively low rates of diagnosable depression, with rates from 2% to 11%, however prevalence rates for subsyndromal depression were considerably higher ranging

from 15 to 20% (the first onset of the disorder in later life, which used to be called late-onset depression (Fiske, Wetherell, & Gatz, 2009; Sjöberg et al., 2017). Although, the prevalence rates for anxiety disorders in older adults range from 1.2 to 14 %, the assessment of the prevalence of mental health problems consistently show that anxiety at subclinical level is in the range of 15-52.3 % (Bryant, Jackson, & Ames, 2008; Wolitzky-Taylor et al., 2010; Volkert et al., 2013).

The aforementioned findings consistently confirm that apart from depression and anxiety manifesting as mental disorders, the existing challenge posit these phenomena presenting themselves at sub-threshold level in older adults (Bryant, Jackson, & Ames, 2008; Wolitzky-Taylor et al., 2010; Witlox et al. 2018; Witlox et al., 2021). Subsyndromal depression among older adults was found to be a risk factor for subsequent development of the full blown major depressive episode and anxiety disorders (Laborde-Lahoz et al., 2015; Smit et al., 2007; Beekman et al., 2000). Anxiety in older adults, even at subclinical level is associated inter alia with decreasing the quality of life and well-being (Diefenbach et al., 2012; Wolitzky – Taylor, 2010). The research based on the World Health Survey (Ayuso-Mateos et al., 2010) in a total of 68 countries showed that both all types of depression and subsyndromal depressive conditions had an adverse impact on health status.

Despite the prevalence of anxiety and depression as disorders and as subsyndromal conditions among older adults, they are very often understudied in this cohort. This challenge is connected with social, developmental and medical contexts (Day, 1996; Carmin & Ownby, 2010; Bryant, Jackson, & Ames, 2008; Wolitzky-Taylor, 2010). Older adults are an underserved population; the majority of older adults in need of mental health treatment do not get support (Parker, Strath, & Swartz, 2008). If these individuals do receive treatment, it is predominantly pharmacological despite the fact that most older adults prefer counselling (Gum, Iser, & Petkus, 2010).

This cohort is not delivered with therapeutic support due to various reasons (Bryant, Jackson, & Ames, 2008; Wolitzky-Taylor, 2010; Diefenbach, 2003; Voshaar, 2013; Wuthrich & Frei, 2015). Older adults may perceive their anxiety and depression symptoms as a natural aspect of aging and neglect the symptoms (Petkus & Wetherell, 2013). Depression in late life often occurs in the context of multiple comorbid medical illnesses. Often, depressive symptoms are misattributed to the normative aging process or perceived as an adaptive response to loss or illness (Blazer & Hybels, 2005).

Older adults may also not receive care because of the lack of knowledge about the possibilities of obtaining mental health counselling (Jorm, 2012). The stigmatisation of mental illness in this age group (Livingstone & Boyd, 2010; Andrade et al., 2014), the problem with recognizing and remembering symptoms by the older people themselves, the barriers in reaching the therapeutic services, especially for people living in rural areas far from medical centres, long waiting lists to mental health specialists (Gamm, Stone, & Pittman, 2010; Andrade et al., 2014) and limited mobility (Lenze & Wetherell, 2009) constitute the problems that need to be addressed. Additionally, anxiety and depression among older adults is considered by the clinicians and the very patients as the epiphenomenon of the physical condition (Witlox et al., 2018). Anxiety disorders in older adults are often undiagnosed due to difficulties with proper differential diagnosis with comorbid somatic illness or neurocognitive disorder or dementia, including mild cognitive impairments. Anxiety and agitation are closely related in persons with some cognitive impairments. The older adults may be agitated due to comorbid medical illness, medication side effects, excessive pain or environmental factors such as lack of adequate stimulation, noise, lack of privacy or unwanted changes in older person's home arrangements. This agitation may be connected with the aforementioned conditions or can be the symptom of anxiety disorder (Seignourel et al., 2008).

Due to the prevalence of subthreshold anxiety and depression levels and many challenges causing distress in everyday functioning of older adults, the need of implementing evidence-based treatment emerges. Considering the aforementioned obstacles in receiving adequate care by older adults and the burden of subsyndromal depression and anxiety, there is an urgent need of implementing evidence-based, low-threshold interventions for older adults (Cuijpers et al., 2015; Cuijpers et al., 2019; Witlox et al., 2021; Witlox et al., 2022). These interventions should be based on dual-continua model of mental health that embraces both psychopathological factors and well-being.

2.6. **Quality of life and ageing**

Quality of life is a complex construct and may be studied in different traditions. The first dominant tradition is connected with economy and sociology and focuses on living conditions and access to income and material goods. The other tradition comprises psychological theories and models, which describe quality of life in the subjective context reflecting psychical well-being (Czapiński, 2015; Diener, Oishi, & Tay, 2018; Trzebińska, 2008). The third tradition integrates both previous trends by studying how objective factors can influence subjective well-being (Diener, Oishi, & Tay, 2018; Diener & Tay, 2015; Tan et al., 2020; Yun, Lee, & Lee, 2022). WHO definition of quality of life is in line with this third approach. It states that quality of life is "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (WHO, 2022). Thus the evaluation of a person's quality of life requires his or her personal perspective on life and surrounding environment and assessing the coherence between individual needs and the resources in the environment. The quality of life concept is similar to and overlapping with such concepts as subjective

well-being, life satisfaction or happiness (Kaczmarek, 2016; Sarvimäki & Stenbock-Hult, 2000).

In gerontology, the quality of life is akin to psychological well-being, high self-esteem, life satisfaction and the sense of satisfaction (Daatland, 2005). Aging is connected with both positive and negative aspects in people's lives. According to some research, the percentage of people being cured is increasing with age and is correlated with an intensification of positive emotions and a decrease of negative emotions (Oleś, 2011).There is also an upper tendency in a reflexive attitude towards evaluation of life satisfaction which correlates with age (Brandtstädter, & Rothermund, 2006). Nevertheless, life-satisfaction itself, although quite stable through the lifespan, deteriorates in the time of late adulthood (Bowling, 2007). The quality of life of older adults depends on many interrelating factors. The sense of life satisfaction, maintaining activeness and independence, and a sense of safety are crucial in building the quality of life of older people. The psychological factors connected with a person's autonomy, subjectivity, the possibility of making choices and the sense of control over one's life are also essential (Sarvimäki & Stenbock-Hult, 2000; Baltes,1997; Freund, Li, & Baltes, 1999). According to the research projects, the quality of life and well-being of older people depend on the lack of discrimination, ability to participate in different life areas, supporting social relations, financial stability, good health (Fernández-Ballesteros et al., 2010).

The important factor influencing well-being is also the ability to adapt to changing situations, also to the occurrence of chronic diseases or disabilities (Segal, Qualls, & Smyer, 2018). The virtue of wisdom is one among many other virtues which are enumerated in positive psychology's attempts to scientifically recognize the nature of trait-like virtues and validate their influence on the quality of life (Trzebińska, 2008; Baltes, Smith, & Staudinger,1991; Sternberg & Grigorenko, 2005; Smedema, & Bhattarai, 2021).

In Erikson's (1980) theory of psychosocial development, the virtue of wisdom emerges from the successful negotiation of the final stage of adult development. The most advanced catalogue of virtues was created by Peterson and Saligman (2004) and its purpose was to conceive "The Manual of Sanities" which would be the positive counterbalance for enumerations of mental disorders collected in the subsequent editions of Diagnostic and Statistical Manual of Mental Disorders (DSM) or WHO's International Classification of Diseases (ICD). Seligman (2011) also hypothesised the key elements of well-being in the PERMA model. Positive Emotion, Engagement, Relationships, Meaning and Accomplishment are five measurable elements that make up well-being. According to some researchers (Goodman et al., 2017; Kashdan, 2017) the PERMA model was redundant due to its association with subjective well-being. Seligman (2018), in his response to the criticism, reminded that PERMA constitutes (at least some of) the elements of well-being and does not form a new kind of well-being. The recent empirical research on the PERMA model (Donaldson, Lee, & Donaldson, 2019; Donaldson et al., 2021; Heshemati et al., 2020, Watanabe et al., 2018) has confirmed that its building blocks are strong predictors of well-being.

The importance of life according to values is also embedded in WHO definition of healthy aging (2014) outlined in 'World report on ageing and health', which is described "as the process of developing and maintaining the functional ability that enables wellbeing in old age". The understanding of health does not consist of the lack of disease but is extended by a functional perspective which promotes older people to live their lives tuned to values (Beard et al., 2017). The outlines of the agenda is, therefore, consistent with the concepts of values and committed action embedded in the ACT model, which will be presented in the following chapter.

The concept of valued living is also present in the model of psychological well-being by Ryff & Singer (2003). Their stance, based on empirical research, takes into account painful emotions and experiences. High quality of life does not mean a life deprived of any burdens but a life in which these difficult events are coped with and reinterpreted. The development of psychological strengths requires acknowledging the dialectics of pain and pleasure – the experiences which are noble and pleasurable and those which are painful and difficult (Ryff & Singer, 2003).

As it was stated before, there are many different theories and conceptualisations describing the quality of life, psychological health and well-being. According to Csikszentmihalyi (1990), engaging in meaningful challenges and passions that are in accordance with a person's self-concept is crucial to live in balance, well-being and psychological health. Deci and Ryan (2000) emphasise that satisfaction of basic needs of belonging, autonomy and competence is the key component of wellbeing. Psychological flexibility is another concept dealing with life satisfaction, daily well-being and psychological health. It is conceptualised inter alia within the framework of ACT (Hayes,Strosahl, & Wilson, 2011), which will be described further. The critical building blocks of psychological flexibility are executive functioning, default mental states and personality configurations (Kashdan & Rottenberg, 2010; Doorley et al., 2020). The decline in executive functioning in senescence can be the factor leading to the psychological inflexibility resulting in rigid responses to personal experiences, e.g. to fear and anxiety resulting in avoidant behaviours (Kashdan & Rottenberg, 2010). Therefore, interventions aiming at promoting psychological flexibility would be recommended for older people as a promising method of reducing problematic symptoms and behaviours, and fostering well being.

“Every time you are tempted to react in the same old way, ask if you want to be a prisoner of the past or a pioneer of the future.”

— Deepak Chopra

3. ACCEPTANCE AND COMMITMENT THERAPY (ACT)

3.1. ACT - a model to support mental health

ACT belongs to the so-called "third-wave" approaches of behaviour therapies. The first generation of behaviour therapy was based on the S-R learning theory (Skinner, 1957) and dealt directly with problematic emotion and behaviour via conditioning and neo-behavioural techniques. Its failure to provide an adequate account of human language and cognition, paved the way for developing cognitive-behaviour therapies. An objective of CBT is changing the elements of human experience. In CBT the emphasis is put on testing, correcting, disputing or eliminating irrational thoughts, abnormal cognitive schemas, or faulty information-processing styles. If a particular thought is supposed to be the cause of undesired action, its content is targeted in the therapy. The CBT clinicians have developed their own cognitive models of a particular disorder and created an array of techniques intended to modify dysfunctional beliefs or faulty information processing connected with concrete disorder (Beck, 1993).

The emergence of constructivism and postmodernist theories favoured a more instrumentalist and contextual approach in science (Zettle et al., 2016). Due to the research revealing that psychotherapeutic treatment has broad impact and the pathological processes are prevalent and comorbid in many disorders, the more general models and treatment approaches emerged. The shift redirected the focus from the form or frequency of cognition to the context in which the cognition occurs (Roemer & Borkovec, 1994; Wells, 1994). Contacting the internal events in order to change their function was introduced into exposure-based therapies (Barlow, 2002) and the evidence-based research supported the effectiveness of mindfulness and acceptance processes in treatment (Welch, Rizvi & Dimidjian; 2006; Linehan, 1993a; Hayes et al., 2004). In general, the third wave of behavioural-cognitive therapy emphasises the significance of context and functions of psychological phenomena,

not only their form. It favours constructing contextual and experiential change strategies. The treatments are based on a flexible and extensive array of methods, instead of eliminative approach to specified problems and clusters of symptoms (Hayes, 2016). The third generation therapies introduce older, less scientific traditions into the mainstream of science (Kabat-Zinn,1994; Robins, 2002; Hayes, 2002), such as issues of spirituality or values, and incorporate humanistic, existential and analytical approaches. The third wave CBT therapies embrace dialectical behaviour therapy (DBT; Linehan, 1993a), mindfulness-based cognitive therapy (MBCT; Segal, Teasdale, & Williams, 2004), meta-cognitive therapy (Wells, 2000), functional analytic psychotherapy (FAP; Kohlenberg & Tsai, 1991), and acceptance and commitment therapy (ACT; Hayes & Brownstein, 1986).

3.2. **ACT – the theoretical background**

ACT interweaves principles of mindfulness and acceptance with treatment techniques adopted from behavioural therapy and experiential psychotherapy (Hayes, Strohsahl & Wilson, 1999). It uses as its central premise the pragmatic philosophy of functional contextualism (Hayes & Brownstein, 1986), which aims at precise and thorough predicting and influencing behaviours. In this view psychological events are understood as actions of the whole organism, which is in continuous interaction with historically and situationally defined contexts (Twohig et al., 2010). These contextual characteristics do not create the parts of the whole unit but they are attributes of the whole unit. In ACT is in line with contextual approach to clinical behavioural analysis which means that behaviour analysis operant is the whole unit perceived holistically. In clinical application ACT is not focused on a form of a particular thought, whether it is rational or true, but rather on the whole event in which the thought appears and the function of the thought.

A pragmatic truth criterion is based on the assumption that whatever brings an analyst closer to a particular goal is "true" (Hayes et al., 1988 after Twohig et al., 2010). ACT conceptualises workability as truth criterion and chosen values define the criteria for the application of workability. Effective manipulation of events can fulfil the goal of influencing the behaviour. The direct manipulation of variables is possible only with the contextual ones. From such a perspective only context determines that thoughts and emotions cause other actions. In ACT the form or content of the thought is not questioned but rather the degree, to which this thought hinders living the life that the client values, is investigated. Analysis of cognition and emotion underlying ACT is focused on manipulable contexts in order to predict and influence behaviour.

Much of the development of ACT derives from comprehensive behavioural research of the processes underlying language and cognition. The Relational Frame Theory (RFT; Hayes et al., 2004, 2006) constitutes a basic theory of human language and cognition and ACT has been developed on its premises. Due to RFT, the essential aspect of human language and cognition is "the learned and contextually controlled ability to arbitrarily relate events mutually and in combinations, and to change functions of specific events based on their relations to others" (Hayes et al., 2006, p. 5). Thus the functions of the particular events can be changed according to their relations to others. The relations can be arbitrary, applicable, mutual and combinatorial (Hayes et al., 2006). According to RFT, human beings do not respond directly to the formal characteristics of the stimuli in the environment, but to the verbally created stimuli (Twohig et al., 2010). The key features of the applied implications of RFT are that: (1) human cognition is a particular example of learned behaviour; (2) cognition changes the influence of other behavioural processes, and; (3) cognitive functions and relations are controlled by different characteristics of situational context (Hayes et al., 2006). The relatedness of events affects the way in which humans experience the world. Relating is

operant that modifies other behavioural processes, including experiential avoidance (Twohig et al., 2010; Malicki & Ostaszewski, 2014; Hayes et al., 2021). For example, the function of one stimulus in a relational network can alter the function of related events according to the primary relation between them. The alteration of stimulus function has clinical implications as relational framing can lead to transforming the function of other stimuli related to the stimulus which is connected with clinical problem (Pomorska & Ostaszewski, 2018). To illustrate this process, the author will cite the example from the article of Pomorska & Ostaszewski (2018). If a person relates the athletic-looking man in sports clothes to a criminal, then he or she can show fear at the sight of a random man looking similarly, regardless of his intentions or behaviour. If this vigilance and connected anxiety is excessive, it may lead to behavioural and psychological consequences, like withdrawal from social contexts and overwhelming psychopathological symptoms.

RFT defines the implications for psychotherapy through accentuating some significant features of language and cognition (Hayes et al., 2006). Primo, it is almost impossible to eliminate the unwanted cognitive processes that can lead to psychopathology because the same cognitive processes are involved in verbal reasoning and problem solving. Secundo, the cognitive networks are the recapture of historical learning processes and cannot be restricted or eliminated just like in extinction procedures learned responding may be inhibited but not completely eliminated. Tertio, direct endeavour to change key nodes in cognitive networks bring paradoxically the opposite effect by creating a context that tends to strengthen the network in this area and increase the cognitive accessibility of these nodes (Purdon, 1999; Purdon, Rowa, & Antony, 2005). Last, but not least, since particular contextual features regulate the content and the impact of cognitive networks, the focus on the form or frequency is not necessary.

From the ACT/RFT perspective, psychopathology derives from the manner that language and cognition interact with ongoing events that hinders flexible persisting or changing behaviour in accordance with long-term values (Hayes et al., 2006).

ACT/RFT defines this kind of psychological inflexibility as a consequence of weak or unhelpful contextual regulation over language processes (Hayes et al., 2006). Human language has evolved as an adaptive means of protection from hostile environments, enabling humans to react, evaluate and compare the events that are small and cumulative, remote in time and of low probability (Wilson & Murrell, 2004). The contingencies which are absent in an immediate environment can be created verbally and become psychologically present and of particular value (i.e. dangerous or desirable). The ability to respond to this kind of stimuli is considered to be the outcome of relational conditioning processes (Wilson et al., 2001; Bąbel et al., 2016). This feature allowed humans to be able to avoid verbally constructed contingency just as they would be wary of actual events. In the ACT model a tendency to avoid aversive psychological contingencies is called experiential avoidance which is a part of ACT model of psychopathology (Wilson & Murrell, 2004). According to this model psychological inflexibility stems inter alia from cognitive fusion defined as a rigid pattern of behaviour which is a consequence of responding rather to relatively inflexible verbal networks than to immediate environmental events. This kind of behaviour is excessively or inadequately regulated by verbal processes, such as rules and evaluations (Hayes et al., 1999; Hayes et al., 2021). Behaviour controlled by verbal processes based on previous experience is restricted and inflexible and thus hinders the contact with more direct contingencies (Twohig et al., 2010). As a consequence of cognitive fusion-guided behaviour, people fail to explore the functional contexts and depart from actions consistent with their chosen values and goals. From ACT perspective, the content, form and frequency of cognition is not problematic as long as it does not guide the behaviour in an unhelpful way, limiting achievement of goals

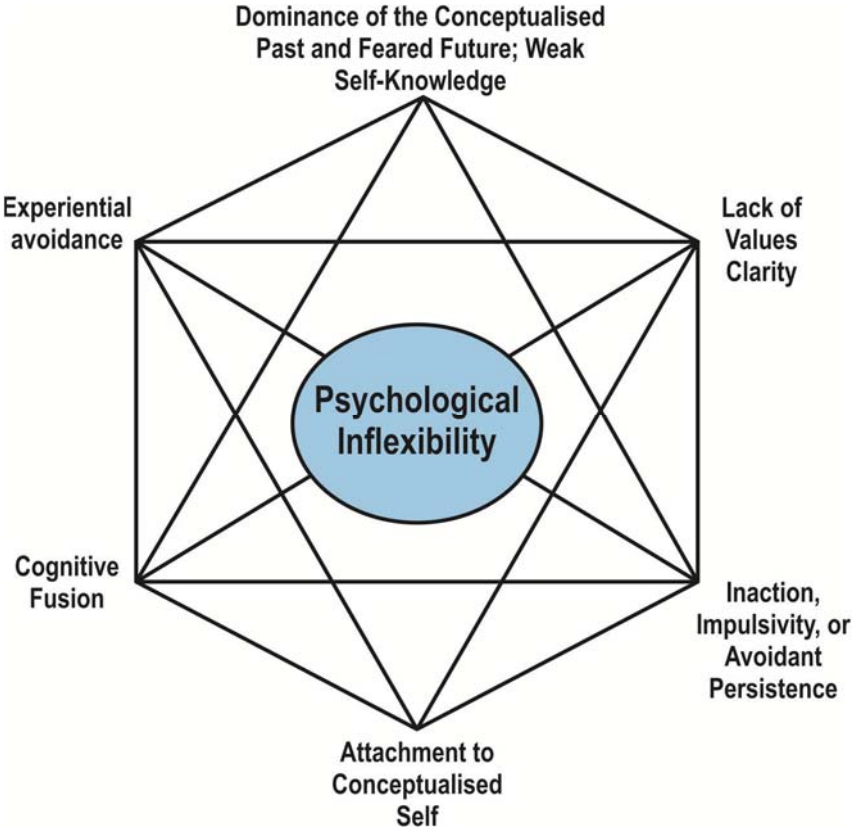
and values (Hayes et al., 2006). Cognitive fusion may be the source of suffering when people fuse consciousness with cognition's content because each thought and the thing that the thought is related to is strongly combined (Hayes, Strosahl & Wilson, 2013). The cognitive fusion makes a person act in accordance with verbal rules and not with his or her values. Verbal rules are internalized in the process of human development. RFT distinguishes three types of abiding rules (Barnes, Hegarty, & Smeets, 1997): social compliance, tracking of consequences and augmentation. Compliance is defined as abiding by verbal rule as a result of learned outcomes of social monitoring of consistency between the rule and behaviour. Social compliance is a form of rigid behaviour and is frequently present in people with inflexible behaviour patterns. More flexible ways of behaviour are the result of tracking the consequences. This kind of abiding by verbal rules derives from the relationship known from the past between the particular rule and natural consequences of complying with it. Augmentation is a form of behaviour which is guided by verbal rules, which can change the degree to which a certain event will be functioning as a consequence. When behaviour excessively relies on verbal rules, it is little susceptible to these changes in the environment which are not embraced by the rule (Catania, Shimoff & Matthews, 1989). Verbal rules are based on the interrelated functional socio-cultural contexts. One of the contexts that can have a deleterious effect in the form of cognitive fusion is a context of literality, which means that the products of cognition are treated as the things that they are related to. In the context of reason-giving human action or inaction is explained in the framework of causality of behaviour even if the reasons of behaviour are objectively non-dependent on one's choices but rather on conditioned private events. As the aforementioned contexts are interrelated, cognitive fusion leads to attempts of controlling, changing the form or frequency of different aspects of experience.

3.3. **ACT – the psychopathological perspective**

According to the ACT/RFT perspective, the primary source of psychopathology is psychological inflexibility and its components as depicted in Figure 4.

Figure 4

An ACT Model of Psychopathology



Note. Reproduced from Hayes et al. (2006)

The psychological inflexibility, described also as rigidity or lack of contextual flexibility, is conceptualised as a vulnerability factor for developing psychopathology and a signal characteristic of many disorders (Kashdan & Rottenberg, 2010). Within the ACT model, psychological inflexibility is a pragmatically useful target in prevention and therapy of many forms of clinical issues. Although the concept of inflexibility is present in research literature, it functions under different labels across publications. In research of cognition in

depression, the psychological inflexibility identified as a vulnerability factor for depression is characterised as the inflexible response style in a form of rumination (Nolen-Hoeksema, Wisco & Lyubomirsky, 2008), attributional style (Abramson, Metalsky, & Alloy, 1989) or exploratory inflexibility (Moore & Fresco, 2007). In the research of borderline personality disorder, the psychological inflexibility was connected to greater attrition, slower reductions in depressive symptoms over the course of treatment, and worse outcomes (Berking et al., 2009). The growing body of research shows that anxiety disorders are also connected with psychological inflexibility, particularly as far as reduced and stereotyped repertory of behavioural responses to fear and anxiety are concerned (Kashdan & Rottenberg, 2010; Doorley et al., 2020). Behavioural inflexibility in anxiety disorders include reflexive worry across situations (Borkovec & Inz, 1990) and experiential avoidance for a variety of experiences.

The transdiagnostic approach is based on identifying and describing processes that are common across different categorially defined taxa of psychopathology (Sharp, Miller, & Heller, 2015). One of the key processes involved in the arising and maintaining various form of psychopathology is experiential avoidance (Akbari et al., 2022; Malicki & Ostaszewski, 2014; Khakpoor et al., 2019; Bardeen & Fergus, 2016; Carvalho et al., 2022; Kashdan et al., 2006; Buhk et al., 2020). It is one of the processes in the ACT model of psychopathology.

Natural language processes enable verbal prediction and evaluation of "negative" cognitions and emotions by making temporal and comparative relations and are the source of experiential avoidance (Hayes et al., 2006). Humans not only avoid the events which are difficult, uncomfortable or dangerous but also anything that is conditioned relationally to them even without close temporal pairing (Wilson & Murrell, 2004). Prevailing cultural narrative promoting "feeling good" and "being happy" sustains attempts to avoid certain aspects of experience (Hayes et al., 2006). Experiential avoidance includes an array of

attempts of avoiding psychological contingencies e. g. controlling the direct experience of a painful private event by means of the thought suppression (Purdon, 1999) or the situational avoidance of contexts associated with difficult cognitions or emotions (Twohig et al., 2010). Avoiding certain uncomfortable experience is in accordance with common sense – it is intuitively purposeful to avoid, reduce or eliminate uncomfortable experience leading to immediate suffering and, therefore, achieve happiness. Verbal relations in our minds create a conditional assumption that avoiding some experience would lead to well-being. However, cognition and emotions cannot be addressed in the same way as we address the items from the physical world, where in order to get rid of something, we throw it away. Attempts to avoid certain psychological experience has a paradoxical effect because the control efforts reinforce the verbal networks associated with conceptualized negative outcomes and make their functional importance more significant (Hayes et al., 2006; Wenzlaff & Wegner, 2000). The experiential avoidance efforts can even paradoxically increase suffering in the long-term (Purdon et al., 2005; Abramowitz, Tolin & Street, 2001).

In the longer perspective, the experiential avoidance of emotions, cognitions and behaviours, narrows the behaviour repertoire and inhibits the possibility of life in the service of chosen values (Hayes et al., 2006). Avoidant strategies limit not only difficult, but also desired emotions (Kashdan et al., 2006).

Experiential avoidance is present in diagnostic criteria across disorders. According to research, experiential avoidance is a vulnerability and maintenance factor in generalised anxiety disorder (GAD). Negative evaluating of internal events, including cognitions (Wells & Carter, 1999), emotions (Mennin et al., 2005; McLaughlin, Mennin, & Farach, 2007) and bodily sensations, is followed by avoidant strategies, predominantly worry. Individuals with GAD tend to avoid anxiety-provoking situations and exhibit habitual nature of anxious responding resulting in experiential avoidance (Roemer, Orsillo, & Salters-Pedneault, 2008).

Other anxiety disorders also manifest themselves in avoidant strategies: escaping from the experience of physiological arousal in panic disorder (Zvolensky & Eifert, 2000), avoiding distress associated with social exposure in social anxiety disorder (Kashdan, et al., 2006) or narrowing the behaviour repertoire in OCD as a result of upsetting thoughts followed by ritualistic behaviour (Kashdan & Rottenberg, 2010). The experiential avoidance strategies repeated excessively and on a regular basis become the default behavioural response and a factor supporting the maintenance of the disorder (Doorley et al., 2020).

Experiential avoidance is often accompanied by other processes included in ACT model of psychopathology. The processes are interrelated and lead to psychological inflexibility. Attachment to conceptualised self and the tendency to use the verbalized content of consciousness to describe the idea of "I" can reduce psychological flexibility (Twohig et al., 2015). Due to the cultural agenda of happiness (Harris, 2019), humans tend to focus on pursuing pleasurable thoughts and emotions and avoiding the difficult ones. Even some models of psychotherapy frequently emphasise that particular cognitions, emotions and bodily sensations lead to problematic behaviour and, therefore, they should be removed, replaced or at least reduced (Wilson & Murrell, 2004). The experiential avoidance processes are the direct consequence of cognitive fusion. Additionally, humans lose contact with the present moment, when they strive to justify their behaviour and to understand the psychological events, and they start to live "in their heads". Psychological inflexibility is further exacerbated by attachment to verbally defined concepts of past, future and self. Instead of engaging in workable actions leading to fulfilling one's goals and serving chosen values, people lose contact with what they desire in life and bind to the concepts of a verbal view of themselves, of alleged reasons of the psychological suffering from the past or to anticipated pain in the future. As a consequence rigid patterns of behaviour emerge, narrowing the repertoire of flexible, values-oriented context sensitive actions. Psychological inflexibility empowers short-

sighted goals of being right, feeling and looking good or defending a conceptualised self and overrules seeing chosen values on the horizon. People lose contact with what is important in their life and pay excessive attention to finding relief from psychological pain. The rigid patterns of action insensitive to the current context gradually narrow the behavioural repertoire of the person, which in turn may lead to psychopathology (Hayes et. al, 2006).

3.4. **ACT – the therapeutic perspective**

ACT targets the aforementioned processes of rigid patterns of behaviour insensitive to current context by increasing psychological flexibility.

According to ACT psychological flexibility is defined as "the ability to contact the present moment more fully as a conscious human being, and to change or persist in behaviour when doing so serves valued ends" (Hayes et al., 2006, p. 7). Traditional CBT techniques are oriented at content of cognition and emotions and their goal is the reduction of concurrent unpleasant experiences, their form or frequency. Alternatively, the interventions based on ACT aim at reducing the struggle that arises when people try to change their internal experiences and motivating people to fulfil their goals and live life in line with the cherished values (Harris, 2019).

ACT is defined as a "psychological intervention based on modern behavioural psychology, including RFT, that applies mindfulness and acceptance processes, and commitment and behaviour change processes, to the creation of psychological flexibility" (Hayes et al., 2006, p. 10). According to ACT and other acceptance-based approaches, psychological flexibility results in better health and well-being despite ongoing experiencing of difficult and painful personal events (Doorey et al., 2020; Wallace and Shapiro, 2006; Malinowski, 2013; Dudek et al., 2014; Kashdan & Rottenberg, 2010; Dudek, Bialaszek, & Ostaszewski, 2016).

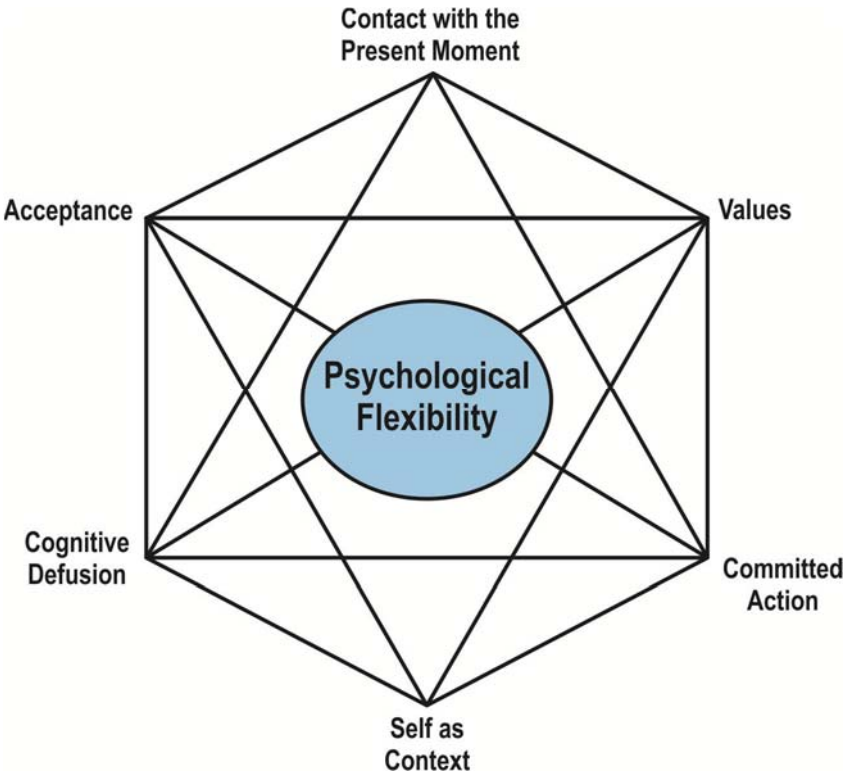
Psychological flexibility was studied with the use of functional neuroimaging. The results confirm that psychological flexibility relies on acceptance and awareness processes accompanied by open receptive attitude towards negative or possibly negative events (Shapiro et al., 2004). The individuals with less openness and acceptance to ongoing cognition and emotions (low in mindfulness) exhibited activation in limbic system structures both when quickly labelling thoughts and feelings as either positive or negative (Creswell et al., 2007). On the contrary, labelling people high in mindfulness leads to a greater activation of the prefrontal cortex and a simultaneous inhibition of the limbic system. This neuroscience evidence shows relation to the two system model of defensive systems (LeDoux & Pine, 2016). In this model, one system is responsible for generating conscious emotions and mainly involves cortical areas, while the other system largely operates unconsciously and controls behavioural and physiological reactions to threats and mostly comprises subcortical areas with connections with certain cortical regions.

Some further neuroscience studies demonstrate that acceptance and openness to experience are connected with executive functioning (DeYoung, Peterson, & Higgins, 2005; Ochsner & Gross, 2008; Malinowski, 2013).

ACT promotes building psychological flexibility through six core ACT processes as shown in Figure 5. The six core processes in ACT overlap and are interrelated.

Figure 5

An ACT Model of the Positive Psychological Processes



Note. Reproduced from Hayes et al. (2006)

Acceptance is a psychological process that is alternative to experiential avoidance. The notion describes the active and aware acknowledging of ongoing private events and embracing them without unhelpful defences (Hayes et al., 2006). Acceptance is not equal to tolerance or resignation, as their nature is passive (Twohig et al., 2010; Harris, 2019). On the contrary, the gist of acceptance is to actively react to the inner experiences (thoughts, emotions, memories, bodily sensations, pain etc.) without attempts to change their form or frequency and without acting according to their literal meaning. The acceptance process though does not change content, form or frequency of private experiences but it alters the function of experiential avoidance process (Twohig et al., 2010). The process of acceptance embraces the behavioural willingness and psychological acceptance (Hayes et al., 2013).

Acceptance is introduced into therapy with the use of psychoeducation, which involves metaphors, exercises and experiential techniques (McMullen et al., 2008).

Acceptance processes stimulate enhancing involvement into actions based on personal values (Hayes et al., 2006). The research proved acceptance to mediate the impact of ACT and to distinguish it from other therapeutic procedures (Bond & Bunce, 2000; Gilford et al., 2004 after Hayes et al., 2013). In older adults, acceptance is related to better emotional well-being and quality of life (Wetherell et al., 2011; Butler, & Ciarrochi, 2007; Shallcross et al., 2013; Smith, 2004).

Cognitive defusion is a process the goal of which is to change the unwanted function of thoughts and other private experiences. It is achieved through altering one's relation to thoughts, which in turn suppresses their unhelpful functions by means of manipulating the verbal contexts (Hayes et al.,1999). Cognitive defusion process suppresses the impact of verbally entangled inner experiences on the regulation of behaviour (Twohig et al., 2010). There is an array of cognitive defusion techniques aiming at changing the way of interacting with and relating to private events. Reducing the literal quality of the thoughts is supported by attempts to perceive them as what they are: mental events that appear and disappear (Hayes et al., 2006; Twohig et al., 2010; Harris, 2019). These procedures include inter alia thanking the mind for a thought, labelling the process of cognition, treating a thought or emotion as an event observed from a distance by defining its shape, colour or size. Difficult or painful thought can be observed dispassionately or repeated out in a loud voice as long as it is heard just as a sound (Hayes et al., 2006). Both processes of acceptance and cognitive defusion are interrelated and are a positive alternative to experiential avoidance. Research shows the effectiveness of ACT in undermining the believability of inner experiences (Bach & Hayes, 2002; Hayes et al., 2004).

Being mindful to what occurs in the present moment fosters a type of defusion strategy – **mindfulness** (Wilson & Murrell, 2004), which involves "paying attention in a particular way: on purpose, in the present moment, non-judgmentally" (Kabat-Zinn, 1994, p. 4). People tend to judge actually everything – events and actions that occur in their lives, other people and their behaviours, characteristics or decisions (Wojciszke, 1991). The prevalence of judging and evaluating is due to its important functions in behaviour regulation. From an adaptive point of view, evaluating is an essential element of human orientation in the environment. Not only people gain orientation in the world by getting to know and understanding the nature of the objects but also by assessing which of them are neutral, which are useful and worth approaching, and which are dangerous and ought to be avoided. Nevertheless, people tend to evaluate excessively, even when it is unhelpful and harmful to fulfilling their current goals. Men could live more calmly and pleasantly and act more effectively if they judge less (Wojciszke, 1991). People evaluate others, but they also assess themselves, which leads to developing a rigid sense of self (Hayes, Strosahl, & Wilson, 2013). The empirical research shows that the skill of focused and flexible paying attention can be learned (Baer, 2003) and that the methods of developing the acceptance and mindfulness may significantly stimulate the basic attentional processes (Chambers, Chuen Yee Lo & Allen, 2008; Jha, Krompinger & Baime, 2007). Some mindfulness techniques based on old Eastern traditions involve paying attention to breathing (Nhat Hanh, 2020). Breathing is regulated automatically, but it can also be regulated through conscious control over the quantity of inhaled breath and the speed of breathing. The aware control over breathing is possible via interaction between the function of executive control of the neo cortex and neurons regulating breathing in the spinal cord and in medulla oblongata (Urfy & Suarez, 2014). When people are stressed, the sympathetic nervous system dominates and, as result, the heart rhythm increases and the breath becomes more shallow (Porges, 2001). Mindful

breathing in a slow, steady way stimulates the vagus nerve and, as a consequence, the parasympathetic nervous system becomes more active toning the reactions of stress reaction (Porges, 2001; Streeter et al., 2012). Control of breathing may help in calming anxiety (Fox et al., 2014; Dickenson et al., 2013; Zeidan et al., 2014). It is considered that mindful focus on somatosensory experience of breathing results in specific improvements to core processes of attentional control (Moore et al., 2012). A variety of mindfulness techniques and breathing exercises are incorporated into treatment protocols in ACT. A growing body of evidence indicates that training based on mindfulness and meditation improves the attentional functions (Slagter et al., 2009; Lutz et al., 2008). It is under this premise that mindful attention training would be of much significance to older people as means of strengthening the ability of sustaining the attentional skills. There is also some research showing that meditation practice may foster the processes of brain plasticity. According to some research (Lazar et al., 2005), meditation experience with focused attention to internal experiences may induce the changes in prefrontal cortical thickness. As the most pronounced changes were observed in older participants, the interventions incorporating meditation and mindful attention training may counterbalance age-related thinning of the cortex.

The processes of attentional control being a core mechanism of working memory are central to the hypothesis of the self-free working memory enhancing disengagement from excessive fear and anxiety (Le Doux, 2017). It is commonly thought that consciousness is a higher brain function (Solms & Panksepp, 2012). It can be defined as the capacity to be aware of the external environment (consciously and unconsciously) and reflect upon inner experiences. Tulving (2002) differentiated three forms of consciousness: anoetic (forms of experience other than thinking, which may be emotionally intense without being “known”), noetic (forms of consciousness connected with thinking, which are linked to exteroceptive perception and cognition) and autonoetic (abstract forms of perceptions and cognitions, which

enable conscious states of awareness and facilitate reflection upon experience through episodic memories and fantasies). The people struggling with excessive worry or anxiety tend to allocate their attention to threatening stimuli and worrying about possible future events. As the emotions of fear and anxiety are the states of anoetic consciousness concerning self, the working memory processes are focused on the content of conscious experience (images, thoughts, feelings) fostering building self-narrative (LeDoux, 2017). During meditation and mindfulness training, working memory processes are deployed to prevent the inflow of information and allow the mind to be present in the here and now, non-judgmentally and free of ongoing self-narrative. While meditation and mindfulness control neural networks of working memory, the self-free mind would not experience fear or anxiety in terms of personal meaning. Thus the anoetic form of consciousness may be modified through disengaging working memory from continuous being self-absorbed through the practice of meditation and mindfulness (LeDoux, 2017).

The training of attention skills is thought to be essential for emotional and cognitive flexibility, which in turn paves the way for mindfulness as the ability to maintain non-judgemental awareness of ongoing thoughts, feelings and physical sensations (Malinowski, 2013). A variety of mindfulness techniques and breathing exercises are incorporated into treatment protocols in ACT.

Contact with the present moment as a positive psychological skill in ACT supports non-judgemental contact with inner experience and events in the outside world as they unfold in present moment (Hayes et al., 2006). The more direct contact with the present moment enables exerting more control over behaviour. The workability criterion promotes actions that are in line with the chosen values and thus events should be noticed and described verbally instead of being anticipated and judged (Hayes et al., 2006).

Self as context. People struggle when they attach excessively to the distinctively harmful form of fusion: attachment to the verbal concept of the self (Hayes et al., 2013; Twohig et al., 2010). In creating a conceptualised self, observations and descriptions are incorporated into self-describing narrative (Hayes et al., 2006). Beside the conceptualised self, ACT differentiates experiencing self as *self as process* and *self as context* (Hayes et al., 2006; Hayes et al., 1999). A self as process is strengthened by contacting the present moment: the direct, moment-to-moment, non-judgemental observing of inner psychological experiences (Hayes et al., 2006). Self as context is fostered in ACT because it allows being aware of inner experiences without attachment to them. This kind of self-concept is present under different terms across psychological literature: transcendent self, I as an observer, continuous awareness, pure awareness etc. In spiritual traditions it is called spirituality, I here and now, wise mind. Self as a context is on the opposite side of the problem solving mode. It is this aspect of I, which cannot be observed, but one needs to assume its perspective (Hayes et al., 2013). This sense of self is a context for verbal knowledge and its limitless (Hayes et al., 2006). From the RFT point of view, *deictic relations* (Hayes et al., 2006), are most important in building the skill of changing the perspective. Deictic relations cannot be modelled with the use of the objects but through demonstrations in different contexts. These relations are important in human development to understand that people can have different perspectives - in the development of skills connected with “theory of mind” (McHugh, Barnes-Holmes, & Barnes-Holmes, 2004). The flexible perspective enables placing an integrated sense of “ I here and now” in any temporal and situational context. This process has clinical implications as it situates self-knowledge in a wider time, social and special framework (Hayes et al., 2013). Self as context in ACT is introduced via mindfulness exercises, metaphors and experiential methods.

Values are the chosen important domains of living – they define what a human wants to stand for in life (Twohig et al., 2010). ACT employs an array of techniques to identify significant life directions. At the same time, it undermines the verbal rules providing incentives to choose values considered to be appropriate, based on avoidance or social compliance (Hayes et al., 2006). Values interventions in ACT increase a person's motivation to engage in actions that enhance pursuing the chosen values, which is in line with the eudaimonic concept of well-being (Ryan & Deci, 2001) and psychological and social components of well-being in Model for Sustainable Mental Health (Bohlmeijer & Westerhof, 2021).

Committed action is a process linked to values-based action, which leads to more flexible behavioural patterns (Hayes et al., 2013). ACT supports effective values consistent actions through goal setting procedures, exposure, skills developing and adjusting methods etc. As the change of behaviour may induce direct contact with psychological adversities, they are addressed through other ACT skills (Hayes et al., 2006).

3.5. **ACT with older adults - rationale**

Arguably, ACT approach resonates particularly with older adults, as in this stage of life the reorientation of individual's life values and desired roles occurs (Petkus & Wetherell, 2013; Witlox et al., 2018; Biglan, Hayes, & Pistorello, 2008). ACT aims to promote increased functional capacity by increasing motivation to perform certain activities in line with personal values. It is necessary in this life phase to learn strategies that facilitate the way in which activities and routines are selected, arranged and performed. This direction is also convergent with the premises of the Selection, Optimization, and Compensation model (Freund & Baltes, 1998). The evidence indicates that disengagement from inadequate goals and commitments and involvement in more feasible goals results in better emotional well-being (Wrosch et al.,

2006; Wrosch et al., 2003). According to Socioemotional Selectivity Theory (Carstensen, 1992), older adults adapt to the changing time perspective and inevitable losses and declines, which enables them to experience life satisfaction (Carstensen et al., 2003). Accordingly, older adults may potentially be more likely to engage in treatments, the goal of which is to live life in accordance with deeply held values. This goal may resonate more with older adults than the goal of cognitive behavioural approaches to treatment aiming at decreasing anxiety and depression. The study by Wetherell et al. (2011) revealed that attrition rates were higher among older adults treated with CBT as compared to those who participated in ACT intervention.

The comorbidity of anxiety and depression symptoms in older adults support the ACT approach. As the anxiety and depression are difficult to distinguish in older adults (Gum & Cheavens, 2008), it is a barrier to implementing a disorder-specific approach to treatment, in which treatment strategy relies upon distinguishing the primary disorder from which a person is suffering. On the contrary, the transdiagnostic approach in ACT, enables assessment and treatment of anxiety and mood disorders more efficiently, as it is not necessary to separate a specific disorder. In the ACT model the processes underlying psychopathology are being addressed, irrelevant to the disorder nosology. The ACT interventions promote psychological flexibility through the key processes of change.

The numerous losses in late life are the source of psychological stress. Both acute stressors and chronic strains have an impact on health and wellbeing in later adulthood. Although stress is an inevitable part of life, it is possible and needed to implement interventions within the stress and coping paradigm that attenuate the influence of stressors on older adults' wellbeing. As older adults experience losses of resources, roles, relationships and other age-related adversities, the acceptance-based coping strategies embedded in the ACT model might be of high value to them. Acceptance in older adults is related to better

emotional well-being and quality of life (Butler & Ciarrochi, 2007; Wetherell et al., 2011; Shallcross et al., 2013). Thus, the ACT approach promotes successful aging through accepting declines and losses that are unchangeable and identifying and focusing on goals that are still attainable.

Older adults suffering from GAD accompanied by elevated anxiety symptoms worry excessively. According to literature, worry is an avoidant mechanism which prolongs and maintains a negative mood in anxiety disorders, especially GAD (Borkovec & Inz, 1990; Newman & Llera, 2011). The content of cognition of older adults is influenced by anxiety. The primary worries of older adults are connected with concerns about sensory and motor impairments, health issues, loss of independence and losing close relations (Montorio et al., 2003; Jeon, Dunkle, & Roberts, 2006). Although anxiety causes hypervigilance to threat both in older and younger adults (Fox, 2001), the research showed that older adults with high levels of anxiety worry more frequently and about more issues, and have less control over the worrying process than younger adults (Montorio et al., 2003). The ACT model may address the issue of worry via numerous pathways. First, when worrying is conceptualised as an avoidant strategy, the processes of contact with the present moment may be useful in addressing this issue. Mindfulness enables a non-judgemental contact with inner experiences as they unfold in the present moment. Therefore, this process redirects attention from the anticipated negative future events exemplified in worries to the current moment. Secondly, as the main content of worrying of older adults focuses on health and developmental losses, the acceptance-based coping approach may be more beneficial than control-oriented strategy. In the CBT approach excessive and maladaptive thoughts in the form of worries are being challenged and replaced with alternative, more realistic thoughts. In case of older adults, this strategy may not be effective as the content of their worries may be realistic. Better strategy for this age group would be acceptance of losses and redirecting the remaining resources to

achievable values-oriented goals. In this way, the process of acceptance of losses is strengthened by the process of committed action.

The ACT approach may also be beneficial for older adults experiencing low mood. Rumination is one of the strategies that represents the way people deal with the experience of low mood (Schut, & Boelen; 2017). The factor hypothesised to sustain recurrent and uncontrollable character of repetitive negative thinking, either abstract or concrete, is attentional disengagement impairment (Kornacka, Krejtz, & Douilliez, 2019). Therefore, together with cognitive functions deterioration characteristic for late adulthood, there is a greater risk of involvement in rumination. Rumination is connected with an avoidant style of coping with negative mood (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Experiential avoidance is an emotion regulation strategy based on avoidance of painful and difficult emotions, thoughts, memories and other internal events (Hayes et al., 2006). Rumination and experiential avoidance as transdiagnostic avoidant processes are regarded as maladaptive and may be involved in the maintenance of psychopathology (Baer, 2007; Hayes et al., 2006; Schut, & Boelen, 2017). As older persons experiencing depressive symptoms avoid activities and receive less pleasure from them, the interventions that involve motivating an individual to engage in pleasurable, values-oriented activities are of high value (Segal, Qualls, & Smyer, 2018). Thus the ACT approach converges with these recommendations. It embraces both values clarification and committed action in the pursuit of these values. Additionally, the process of contact with the present moment embedded in the ACT model, fosters focusing attention on experiences in the current moment as opposed to being caught up in ruminative thoughts about these experiences. For example, mindful breathing fosters directing attention back to breath, hereby preventing further engagement in prolonged rumination (Schut & Boelen, 2016).

The rationale for delivering ACT to older adults is connected with the research on emotion regulation strategies. The ability to regulate emotions improve with age, which leads to high levels of adaptability (Freund, Li, & Baltes, 1999; Zautra & Reich, 2012) and may be connected with the positivity bias in late adulthood (Reed et al., 2014; Kennedy et al., 2004; Whatley et al., 2022). This resilience is also built upon the ability to dissociate past feelings from current feelings. Some authors (Petkus and Wetherell, 2013) suggest that these phenomena connected with aging could suggest lower levels of cognitive fusion. Therefore, the ACT model draws upon the strengths of older people.

The ACT intervention may be credible with older adults when taking into account the deterioration of cognitive functions. ACT's core assumptions are consistent with both SOC (Baltes, 1997) and SST (Carstensen et al., 2003) concepts in the domain of selecting and achieving goals despite the cognitive decline, by employing compensation strategies for allocation of memory and attention. Additionally, ACT promotes concentrating on meaningful items, which fosters remembering in older adults. It also incorporates mindfulness processes that, as it was described previously, is a form of attention training.

3.6. **ACT: Research and criticism**

Research. There's a growing base of research showing the effectiveness of ACT interventions in a wide range of psychological and health problems (Hayes et al., 2006; A-Tjak et al., 2015; Witlox et al., 2021), which supports the notion of ACT as an effective transdiagnostic model of mental health promotion, protection and treatment. The potential clinical implementation of targeting the core processes of ACT is supported by the data from the research. Although CBT is the first line treatment for anxiety disorder (Tolin, 2010), it is not efficacious for all individuals. Hence the interventions based on ACT are considered to be an alternative option to treating anxiety and depression disorders (Bluett et al., 2014; Swain et

al., 2013; Twohig & Levin, 2017). Numerous clinical studies revealed that not only ACT-based intervention draws the increase in psychological flexibility (Fledderus et al., 2012; Scott et al., 2016), but also increase in psychological flexibility mediates the effectiveness of ACT (Lillis & Kendra, 2014; Wicksell et al., 2013; Thompson et al., 2021).

The meta-analysis of 39 randomised controlled trials (A-Tjak et al., 2015) found that ACT-based interventions were more effective than treatment as usual or placebo in lowering the levels of anxiety and depression and may be effective in treatment of addiction and somatic health problems.

Other meta-analytic review's results showed positive and significant relationships between the core processes of ACT and anxiety symptomatology both in general and specific measures of disorder severity (Bluett et al., 2014). Numerous case studies support the notion that ACT procedures are effective with anxiety and stress disorders including posttraumatic stress disorder (Batten & Hayes, 2005), panic disorder (López, 2000; Ivanova et al., 2016), GAD (de Almeida Sampaio et al., 2020; Roemer & Orsillo, 2008), agoraphobia (Zaldivar & Hernandez) and social phobia (Block, 2002 after Twohig, 2010). The effectiveness of ACT for anxiety, depression and other mental health conditions was confirmed in the recent meta-analysis of 20 randomised controlled trials (Gloster et al., 2020). The ACT-based interventions were more effective in comparison to inactive control, treatment as usual and active interventions excluding traditional CBT.

Another meta-analysis of randomised controlled trials focusing on subjective well-being showed moderate effect sizes in favour of ACT indicating the effectiveness of ACT in enhancing well-being in both clinical and non-clinical samples (Stenhoff et al., 2020). The effectiveness of ACT interventions in lowering the depressive and anxiety symptoms delivered in group format was found in meta-analysis by Ferreira et al. (2022) across 48 randomised controlled trials.

Summing up, according to growing body of literature and recent research, the ACT-based interventions were confirmed to be effective across different mental disorders, such as depression and anxiety (Arch et al., 2012; Berghoff et al., 2018; Twohig et al., 2015; A-Tjak et al., 2021); psychosis (Larsson et al., 2022; Gates et al., 2021); substance use (Lee et al., 2015); different medical conditions (Dochat et al., 2021); chronic pain (Wetherell et al., 2011; Moens et al., 2022; Fei et al., 2020); distress (Levin, Krafft, & Twohig, 2020; Proctor et al., 2018; Puolakanaho et al., 2018).

The research assessing the effectiveness of ACT among older adults is scarce.

In the research by Alonso-Fernández et al. (2013; 2016) the intervention was based on ACT and on the Selective Optimization with Compensation model. The participants were nursing home residents with chronic musculoskeletal pain (mean age = 82.26; SD =10.00). They were randomised to the intervention condition and to the minimal support control group. The results of the study showed a significant increase in chronic pain acceptance between baseline and post-treatment measurements for participants in the experimental group, whereas no significant differences were found for the control group. The significant changes between measurements were observed for pain interference in walking ability, pain anxiety, pain acceptance processes, and compensation strategies only for the experimental group were. Additionally, the participants in the experimental group experienced lower levels of depressive symptoms and pain-related anxiety after the intervention.

In RCT conducted among older adults residing in long-term care facilities (Davison, 2017), the participants attended either a 12-session ACT intervention or were assigned to a wait list control group. The symptoms of anxiety and depression were measured at baseline, after treatment and at three-month follow up. The scores on depression were significantly lower in the group participating in ACT- based programme after the intervention as controlled for baseline scores and at follow- up. Some studies report ineffectiveness of ACT intervention

with older adults with GAD in anxiety symptomatology. In one of such studies (Wetherell et al., 2011), the participants were assigned to CBT and ACT condition. The between group comparisons were not conducted because of low sample size. In the ACT group the improvements were in the measures of worry and depressive symptoms, but not in the anxiety levels.

In the research by Witlox et al. (2021, 2022), adults at the age between 55-75 years with mild to severe anxiety symptoms were recruited to participate either in blended ACT or face-to-face CBT. The results confirmed that ACT-based intervention may be proposed as an alternative to CBT, due to the fact that in both conditions there were large reductions in anxiety symptom severity, and additionally the long-term effects on positive mental health were significantly stronger for blended ACT. The results of the study by Wetherell, Herbert, & Afari (2019) among adults aged 18-89 suffering from pain conditions showed that CBT was more suitable for younger adults. ACT was found to be an effective alternative for older adults.

As the recent pandemic showed, under some circumstances the access to the stationary forms of treatment is hindered. Moreover, many people live far from the mental health support centres. In such cases the internet-based interventions are highly useful. The utility of self-help internet delivered interventions has been explored either based on ACT exclusively or only on the process of mindfulness.

The internet interventions based on ACT (iACT interventions) are reported to be effective with regards to depressive and anxiety symptoms (Fledderus et al., 2012; Pots et al., 2016) and pain (Van de Graaf et al., 2021; Scott et al., 2021; Herbert e al., 2022).The mindfulness-based stand-alone, unguided, online treatment program for anxiety was found effective in lowering the symptoms of anxiety, depression, and insomnia and additionally achieved a moderate improvement in the quality of life (Boettcher et al., 2014). In this study,

91 participants suffering from different kinds of anxiety disorders were assigned to a mindfulness treatment group and to a discussion control group. A meta-analysis reviewing self-help interventions based on mindfulness (Cavanagh et al., 2014) showed that these kinds of treatment had a positive impact on mindfulness and acceptance skills, and decreased the levels of anxiety and depression as compared to control conditions. Similar results regarding anxiety were reported in another meta-analysis based on 11 comparisons (Spijkerman, 2015). The significant small effect of online mindfulness-based intervention on anxiety was found. In the recent meta-analyses of 25 web-based ACT interventions, guided interventions showed higher efficacy than only self-help programmes (Thompson, Twohig, & Luoma, 2021). Although the iACT treatments were more effective in clinical samples than in nonclinical populations, the reliable, clinically significant effects were not confirmed. There is also a gap concerning the research on ACT-based interventions among older adults in non-clinical samples.

Much empirical research to date has been conducted on the mechanisms of ACT as mediating therapeutic change. Despite the areas of overlap between ACT and CBT, the mediational analyses (e.g. Zettle et al., 2011) of CBT and ACT proved that the mechanisms of action alter between the two approaches. ACT is effective due to the core processes of change it proposes. The laboratory-based component research is a useful methodology for the examination of theoretical models underlying intervention approaches (Kazdin, 2007). A meta analysis of 66 laboratory-based component studies by Levin et al. (2012) evaluated the treatment processes and mechanisms that are proposed by the psychological flexibility model underlying ACT. In the analyses based on the relevant studies and outcomes, effect sizes were calculated for each psychological flexibility component with comparison to inactive conditions. The results showed the significant positive effect sizes for acceptance, defusion,

present moment and values connected with mindfulness component conditions compared to inactive comparison conditions.

In the study by Pots et al. (2016), 236 adults from the general population with mild to moderate depressive symptoms were randomised either to web-based ACT or to control condition: waiting list or expressive writing. The results of the mediation analyses in this study confirmed that psychological flexibility and mindfulness are distinct process mechanisms that mediate the effect of web-based ACT intervention on depressive symptoms. A recent meta-analysis focusing on clinical population samples showed that psychological flexibility mediated improvement in different aspects of mental health (Stockton et al., 2019).

Criticism. As the main assumption of RFT is that relating is the broad and generalizable operant (operants are composed of an antecedent stimulus, a response, and a consequating stimulus), it has not been recognized by the well-known behavior analysts at the time of its formulation (Sidman, 2000; Hayes et al., 2021). According to some authors (Sidman, 2000), relating is not an operant, but the process by which equivalence relations came about is a learned response. The ACT model itself has also received some sceptical opinions. Initially, the criticism of ACT was connected with the ratio of non-empirical to empirical articles in support of this new model (Corrigan, 2001; 2002). The scepticism about ACT was also based on the assumption that it does not substantially differ from CBT (Asmundson & Hadjistavropolous, 2006; Hofmann & Asmundson, 2008; Hofmann, 2008). Some authors (Hofmann & Asmundson, 2008; Hofmann, 2008) noted that proponents of ACT misinterpreted the empirical evidence supporting CBT and proposed to replace CBT with ACT as the dominant form of psychological therapy. It was also underlined that there were essential similarities between the theory and philosophy underlying ACT and Eastern holistic approaches (Hofmann, 2008). The paper by Gaudiano (2011) presented a detailed analysis of Hofmann & Asmundson's (2008) rebuttal to Hayes and colleagues' criticism of CBT together

with the author's own opinions on the issue. In brief, the author (Gaudiano, 2011) argued that Hofmann & Asmundson failed to contradict the actual qualities of Hayes's critiques of CBT in the majority of cases. He confirmed the claim that CBT is more mechanistic in its underlying assumptions and thus more focused on symptom reduction than ACT as a contextual approach. Gaudiano (2011) also emphasised the Hofmann & Asmundson‘s misunderstanding of the principles of ACT. For example, Hofmann & Asmundson exemplified ACT techniques as the principles of change, while ACT argued for the importance of principles of behavior change and thus incorporate whatever techniques support this aim. Gaudiano (2011) also raised a critical remark concerning the adherence of ACT and CBT. He underlined that in ACT, the processes of change are identified in the research via mediational analysis while the proposed changes in cognitive processes targeted in CBT were supported by very little empirical evidence. He also contradicted that the proponents of ACT claimed to replace CBT with ACT, they rather proposed that ACT was an extension of the behavioral and cognitive traditions, but it was distinctive enough in theoretical frames to be distinguished from traditional CBT. In the end, Gaudiano (2011) summarised that Hofmann & Asmundson criticised ACT by defining it in overly simplistic terms and thus made it easier to argue against. He finally concluded that further substantial debate and dialogue on the topic of comparing and contrasting ACT and traditional CBT was warranted.

Some scepticism about the ACT approach was also expressed by the author of a meta-analysis of 60 RCTs on psychiatric and somatic disorders and stress at work (Öst, 2014). He showed that the obtained mean effect size across comparisons was small. There was no significant effect when ACT was compared to other treatments (cognitive or behavioural). In the concluding suggestion, Öst (2014) stated that research on ACT was not advancing in quality and that this approach had not yet been well-established for any disorder and possibly only efficacious for some conditions such as chronic pain and drug abuse. However, the

publication received much criticism due to its factual and interpretive errors and quality ratings and was interpreted as unreliable and biased against ACT (Atkins et al., 2017). In his rebuttal, Öst (2017) remained in his stand and supported his original results. However, it is worth noticing that ACT has already been listed by APA as an evidence-based treatment.

4. CURRENT RESEARCH

4.1. **Rationale**

The number of people aged 60 years and older is increasing at a steady and unprecedented rate, especially in developing countries (WHO, 2015).

The resulting changes in population structures and challenges connected with changes in physical, mental and cognitive functioning of older adults, require programmes aimed not only at securing basic needs and health for older adults, but also at fostering their well-being. In this context, an underestimated problem is the prevalence of subclinical forms of anxiety and depression (Witlox et al., 2018). This requires urgent attention, as psychopathological symptoms which manifest at low thresholds predispose older persons to full-blown mental disorders (Grenier et al., 2011; Witlox et al., 2021). Despite the increasing prevalence of anxiety, depression, and stress levels in this demographic, many older persons remain underserved (Wolitzky-Taylor, 2010; Gum, Iser, & Petkus, 2010; Kelson, 2017).

For older adults, quality of life not only depends on reduced distress and psychopathology, but also on many interrelated factors. For example, the sense of life satisfaction, ability to maintain activeness/independence, and feelings of safety are critically important (Steuden, 2014).

Older adults are particularly vulnerable to stress, anxiety and depression symptoms due to substantial number of challenges, risk factors and decline connected with aging (Hill, 2005; Pachana, 2021; Sharp, Miller & Heller, 2015; Gallacher et al., 2009; Yochim, Mueller & Segal, 2013). Age-related decline in physical health, cognitive deteriorations, losses and limitations in everyday life can trigger psychopathological symptomatology. Older adults face chronic and uncontrollable stressors in the form of chronic disease or disability, limiting of

social support networks, reduction in available resources and role loss (widowhood, retirement), which significantly affect physical and mental health, and wellbeing (Simning & Seplaki, 2020; Hohls et al., 2018; Cuijpers et al., 2015; Vahia, et al., 2010; Witlox et al., 2022).

Moreover, the importance of a fulfilling life is embedded in the WHO (2015) definition of healthy aging. The understanding of health does not merely constitute the lack of disease, but also covers the functional perspective in which older persons are able to live in congruence with their own values (Beard et al., 2017). As the WHO agenda accentuates the positive aspects of mental health, it is also consistent with the Model for Sustainable Mental Health (MSMH) (Bohlmeijer et al., 2021). In brief, according to this model, psychological treatments should be analysed due to the scope of relevant barriers and resources needed for adaptation processes. In relevance to the current research, the intervention based on the ACT model is proposed as a programme that targets barriers and foster adaptation resources (Hayes et al., 2011).

In the ACT model, psychological inflexibility is regarded as a vulnerability factor for developing psychopathology and leads to lowering of the quality of life (Petkus & Wetherell, 2013; Kashdan & Rottenberg, 2010). Efforts to avoid certain unwanted cognition, behaviour and emotion, referred to as experiential avoidance, are associated with a broad spectrum of psychological and behavioural difficulties (Hayes et al., 2006; Roemer, Orsillo, & Salters-Pedneault, 2008; Twohig et al., 2010; Purdon et al., 2005; Zvolensky & Eifert, 2000; Kashdan, et al., 2006; Kashdan & Rottenberg, 2010; Doorley et al., 2020), lead to lowering of meaning in life in older adults (Krause, 2007) and increase suicidal ideation in older adults with depression (Cukrowicz et al., 2008).

In the ACT model, the aim is contrary to reducing the form, frequency or discomfort of experiencing painful internal experiences. On the contrary, it promotes reducing the struggle that arises when people attempt to suppress their internal experiences (Hayes et al., 2006; Twohig et al., 2010). The individuals entangled in experiential avoidance exert energy in avoiding certain experiences, with neglecting and losing contact with their personal values (Petkus & Wetherell, 2013).

Hence, in ACT-based interventions the experiential avoidance is targeted together with enhancing building psychological flexibility through core ACT processes. Psychological flexibility is conceptualised as the ability to fully engage in the present moment and to persist or change behaviour in line with personal goals and values (Hayes et al., 2006). Due to these qualities, the ACT approach may help older persons address problematic issues and foster their well-being.

As older adults face difficulties with reaching the mental health care system, especially in remote areas far from therapeutic centres, there is an exigent need of implementing the easy and widely available interventions with reliable effectiveness.

In summary, the rationale for the current study is as follows:

1. Declines and adversities associated with aging may lead to psychological inflexibility resulting in increasing psychopathological symptoms and lowering quality of life.
2. According to WHO healthy aging is associated with fulfilling life in pursuit of one's own personal values. Pursuing achievable goals in the face of the shift in the gain/loss dynamics at this stage of life and promoting life in accordance to deeply held values are embedded both in SOC and ACT models.
3. Previous research has shown that interventions based on ACT have potential in an array of psychological and behavioural problems.

4. The aim of ACT intervention is increasing psychological flexibility and living life according to own values resulting in the increasing of quality of life and/or reducing psychopathological symptoms.
5. The ACT-based intervention may be particularly beneficial for older individuals as its goal resonates with older adults, who reorient on important values in the face of altered time perspective outlined in SST.
6. No study has yet evaluated the effectiveness of ACT-based interventions in Poland.
7. With changing demographics, older adults remain an underserved population, despite the prevalence of subsyndromal anxiety and depression.
8. The results of the current research provide evidence supporting introducing ACT-based interventions into prevention programmes and can suggest multiple pathways by which the intervention can be delivered to older adults.

4.2. **Aim and design**

The overarching scientific aim of the dissertation was assessing the effectiveness of an original intervention based on the premises of ACT among older adults in Poland. This aim was achieved by analysing the data from two separate cluster randomised controlled trials. The effectiveness of the training was operationalized as lowering the level of psychopathological symptoms (depression/ anxiety/ psychological stress) and/or increasing the quality of life between two measurements – the baseline and after the participation in the intervention or after the time lapse. Thus based on the theoretical framing and the foregoing review of the literature and the overview of the body of research, the following main hypotheses were postulated:

Hypothesis 1: The ACT-based training will be effective in increasing the quality of life.

Hypothesis 2: The ACT-based training will be effective in the reduction of the psychopathological symptoms.

Two cluster randomised controlled trials (RCTs) were conducted in order to fulfil the aim of the study.

RCT is an experimental form of efficacy evaluation in which the population receiving the programme intervention is chosen at random from the eligible population, and a control group is also chosen at random from the same eligible population. It was predominantly employed in the previous research on the effectiveness of ACT (Witlox, 2018; Alonso-Fernandez et al., 2015; Fledderus et al., 2012; Pots et al., 2016; Forman et al., 2007; Hacker, Stone & MacBeth, 2016; Kyllönen et al., 2018; Ritzert et al., 2016).

In the current studies the cluster RCT design was implemented. In a clustered trial, the unit of randomization is not the individual participant, but a group of participants (in this research the persons from different daily care houses in Poland).

In both studies, the groups of participants were randomly assigned to intervention conditions: either to experimental or to control. The a priori power analysis in the programme G*Power was conducted for repeated measures ANOVA for group comparison. The level of α was estimated at the level of β equalled to 0.2 for power on the level of 0.8 and the effect size was estimated based on the literature search (Kyonka, 2018, after: Cohen, 1992). The up-to-date research on the effectiveness of ACT in older adults reported moderate to large effect sizes for ACT for anxiety and depression (Kishita et al., 2016; Hacker et al., 2016; Hayes et al. 2012; A-Tjak et al., 2015; Hacker, Stone, & Macbeth, 2015). After introducing the aforementioned parameters into the G*Power programme, it computed the optimal overall sample size at 34 people.

The participants of the experimental groups took part in a 12-module original programme entitled “Arte Vitae” created on the basis of previous research of ACT-based interventions (Twohig et al., 2010; Roemer , Orsillo & Salters-Pedneault, 2008; Wetherell et al., 2011; Boettcher, 2014) and literature survey (Hayes, Smith 2019; Harris 2019; Forsyth, Eifert 2016). The participants of the control group in the first study did not participate in the training programme between measurements. The control group in the second study was active and its participants took part in the training based on the premises of Positive Psychology (Seligman et al., 2005).

Both studies were conducted in the small villages and towns with a population less than 25 thousand dwellers. All of the volunteers were recruited at the centres of daily care for older people, where they could eat meals together, spend time with peers and take part in numerous activities (cultural, sport, handcraft) free of charge thanks to locally supported initiatives or programmes subsidised by the European Union. The research project was approved by the Ethics Committee for Scientific Research of the Faculty of Psychology at SWPS University (no 11/2020). The research and training of volunteers lasted from July until October 2020 in the first study and from August to November 2021 in the second study.

4.3. **ACT-based intervention Arte Vitae**

The original intervention programme designed by the Author of this dissertation was implemented in the current research. A 12-module training programme entitled *Arte Vitae* is based on the premises of ACT therapy and designed on the basis of scientific literature (Hayes & Smith, 2019; Harris, 2019; Forsyth & Eifert, 2016). The contents of the training programme focus on building psychological competences, based on the core ACT processes.

The vast amount of the content of the programme incorporates metaphors, logical paradoxes, experiential exercises and behavioural techniques was incorporated from the

intervention protocols previously used in research on effectiveness of ACT with anxiety (Twohig et al., 2010; Roemer, Orsillo & Salters-Pedneault, 2008; Wetherell et al., 2011; Boetther, 2014). The original input of the Author of this dissertation into creating the *Arte Vitae* intervention protocol was choosing and organising the content of the intervention in order to customise it to the needs and the areas of interest of older adults (especially in the values module). This goal was accomplished with bearing in mind the specific needs of older adults at this developmental stage as specified in SOC and SST theories. Additionally, apart from the conventional ACT techniques and metaphors, the Author enriched the programme by the use of visual aids, including photos and graphics with quotations or short texts. They were displayed as a presentation, with bold enlarged fonts to meet the needs of older adults with visual impairments.

The intervention protocol was first used with individual patients – the case study is presented in the article (Chojak & Papińska 2020). Modules of the programme include exercises that foster building psychological flexibility through processes specific to ACT. The initial sessions (1-2) introduce the aims of the programme, core concepts of ACT: acceptance, cognitive defusion and mindfulness. The third session targets experiential avoidance via psychoeducation and metaphors regarding excessive control over thoughts and feelings, and exercises building creative hopelessness. The work on the following sessions is concentrated on the processes of acceptance, cognitive defusion and contact with the present moment. Metaphors and psychoeducation (sessions 5-6) encourage to change the relationship with thoughts and other private experiences in order to perceive them as mental events that appear and disappear one after another. Session 7 expands the concept of being in the present moment accompanied by the metaphor referring to cognitive defusion, while the main theme of session 8 is self-as-context construct. The following sessions (9-10) focus on identifying values and goals and incorporate exercises revising the core ACT skills (session 11). The

values exercises included the use of cards prepared by Louise Hayes (http://contextualpsychology.org /louise_hayes_training_page); the original texts were put onto the theme photos and displayed for the participants of the study. The cards are presented in Annex 3. Values clarification enables reconnection with the values that give meaning and purpose to life. It also expands the awareness of the potential directions and ways of current behaviour incompatibility with these values. Thus, the final session focuses on promoting action in compliance with chosen values.

The components of the protocol are presented in Table 1. The trained psychological skills conceptualised as the core psychological flexibility processes overlap, interrelate and supplement each other, therefore they are combined in the modules of the protocol and not presented separately in each session. These aids were also used in the mobile application and included in self-help manuals in the form of books, which were given after the study to the members of the control group. The mindfulness exercises were recorded in the professional studio (Fundacja Mai i Mata Kwiatkowskich) and used during the intervention.

Table 1

The ACT-based Training Protocol Arte Vitae

	Aim of the session/ ACT processes/trained psychological skill	Exercises/ techniques/texts
1. Introduction. Setting goals.	Case conceptualisation, psychoeducation: introduction into the assumptions of ACT, contact with the present moment, mindfulness.	ACT case formulation worksheet, "Drop anchor" exercise, "10 mindful breaths" exercise, "Notice 5 things" exercise.
2. To be here and now.	Contact with the present moment, mindfulness, introduction into defusion, introduction into the committed action, acceptance, willingness, cognitive defusion.	"10 mindful breaths" exercise, "Mind as a time machine" metaphor, "Mindfulness of breath" exercise, Analysing "What could change in your relations if your life was free of pain and anxiety", "Leaves on the stream" exercise, "Mindfulness of pleasant activities".
3. To understand difficult emotions.	Psychoeducation: abandoning control , creative hopelessness, psychoeducation: normalisation of negative thinking in order to facilitate acceptance and defusion, psychoeducation: our thoughts or feelings are not a problem but our attitude towards them (fusion or avoiding) & our thoughts and feelings do not control our actions.	"Control is the problem" text, "The happiness trap" text, "The caveman's mind" metaphor, "The bin"exercise, "Emotions are part of human experience" text.
4. Acceptance.	Psychoeducation: giving up the struggle with difficult thoughts and emotions, normalisation of difficult emotions in life, creative hopelessness, acceptance, cognitive defusion, contact with the present moment, introduction into self-as-context.	"Tug of war with monsters" metaphor, "Quicksand" metaphor, "Emotions changing like a weather" metaphor, "Your choice: decision to feel" text, "I'm having the thought that…" exercise, "This feeling is telling you…" text, "Struggle switch" metaphor, "Observing & breathing into the emotion" exercise, "The mind as stage" metaphor.
5. Observe your thoughts.	Cognitive defusion, contact with the present moment, normalization of negative thinking in order to facilitate acceptance and defusion, psychoeducation: abandoning control, introduction into the committed action.	Observing thoughts, "Mindfulness of breath" exercise, "Caveman mind" metaphor, "Overprotective friend" metaphor, "I'm having a thought that…"exercise, "Walk in the rain" metaphor.
6. Thoughts do not control our actions.	Creative hopelessness, normalisation of negative thinking, defusion, acceptance.	"The inevitability of comparison" text, "If our thoughts and feelings controlled our actions" text, "Leaves on the stream" exercise, "Accepting emotions".

	Aim of the session/ ACT processes/trained psychological skill	Exercises/ techniques/texts
7. To be in the present moment.	Contact with the present moment, defusion, acceptance.	"Drop anchor" exercise, "Mind as a time machine" metaphor, "Mindfulness of the breath".
8. Point of view - to look at oneself from a distance.	Contact with the present moment, acceptance, self-as-context, defusion.	"The chessboard" metaphor, "The Observer" exercise.
9. Recognize what is important.	Contact with the present moment, acceptance, defining values, psychoeducation: values.	"Drop anchor" exercise, "The magic wand" exercise, "Documentary about you" exercise, "10 aware breaths" exercise, Values -a list of questions about values, "10 valued domains" exercise.
10. Closer to values.	Values, contact with the present moment, acceptance.	Values – Hayes cards, "Drop anchor" exercise, "Safe place" exercise.
11. Be present.	Contact with the present moment, mindfulness, cognitive defusion, self-as-context.	"Mindfulness of the breath" exercise, "Mindful listening to classical music" exercise," Acceptance of emotions" text.
12. Act according to values.	Values, acceptance, committed action.	"Safe place" exercise, "The role of values" text, "The valued areas of life" exercise, "Values are here and now" exercise.

5. STUDY 1

The aim of the current study was evaluating the effectiveness of an original intervention based on the premises of ACT among older adults in Poland. The effectiveness of the intervention was operationalized as lowering the level of psychopathological symptoms (depression/ anxiety/ psychological stress) and/or increasing the quality of life post intervention and at the six months follow up.

5.1. **Hypotheses**

Hypothesis 1: The ACT-based training will be effective in increasing the quality of life.
Hypothesis 2: The ACT-based training will be effective in the reduction of the psychopathological symptoms.

Apart from the main hypotheses in the research the current study investigated the following hypotheses:

Hypothesis 3: The level of experiential avoidance, psychological flexibility, contact with the present moment (mindfulness), values will change significantly between measurements only in the experimental group.
Hypothesis 4: The change in the level of experiential avoidance will mediate the lowering of the psychopathological symptoms and/or the increasing the quality of life.
Hypothesis 5: The change in psychological flexibility and its selected components (mindfulness/values) will mediate the lowering of the psychopathological symptoms and/or the increasing of the quality of life.
Hypothesis 6: The level of cognitive functioning will moderate the relationship between the first and the second measurement of the symptoms of psychological stress, depression and anxiety and of quality of life.

5.2. **Participants**

Volunteers were recruited in February 2020 from the daily care homes for older people in small towns (less than 25 thousand dwellers) in Poland. Due to the global epidemiological situation the research was postponed to July-October 2020, the follow-up measures were carried out in April 2021. Inclusion criteria were the age over 60 years old and/or not attending the psychotherapy sessions during the previous year.

Out of 64 volunteers 60 participants took part in the study. Four volunteers were excluded because of not fulfilling the inclusion criteria. Written informed consent was obtained from each participant. The participants fulfilled the demographics questionnaire. The mean age of subjects was 75.5 (range 60 -91 years). The majority was female (42 women and 18 men). Almost all the participants (91.7%) were retired or occupationally inactive. The majority of participants (41.7%), including mainly the oldest of them, have completed primary education; the others graduated from the secondary and higher education (26.7%) or completed occupational education (31.7%). All of the participants were dwellers of small towns and villages: 20 people lived in towns with less than 25 thousand dwellers, 31 in towns with less than 10 thousand dwellers and 9 people lived in villages. More than half of all participants (60%) reported practising regular physical activities and almost half of them (47.5%) had a sense of being physically healthy. Drinking more than 2-3 portions of alcohol was reported by 2 persons. The vast majority of participants reported being satisfied with family relations (91.7%) and meeting friends and family on a regular basis (89.8%). Each participant was examined with the use of the Mini Mental Examination Scale (MMSE; Folstein, Folstein & McHugh, 1975). Persons who scored less than 26 in MMSE were advised to contact the nearest neurological clinic (the contact details were provided to them and to a family member with the consent of the participant). The characteristics of participants are presented in Table 2.

Table 2

The Statistical Characteristics of Participants

	Frequency	Percentage
Place of living		
Village	9	15.0
Town with less than 10 000 habitants	31	46.7
Town with less than 25 000 habitants	20	38.3
Education level		
Primary	25	41.7
Occupational	19	31.7
Secondary and higher	16	26.7
Financial situation		
Unsatisfactory	6	10.0
Moderate	34	56.7
Good	19	31.7
Very good	1	1.7
Vocational activity		
Yes	5	8.3
No	55	91.7

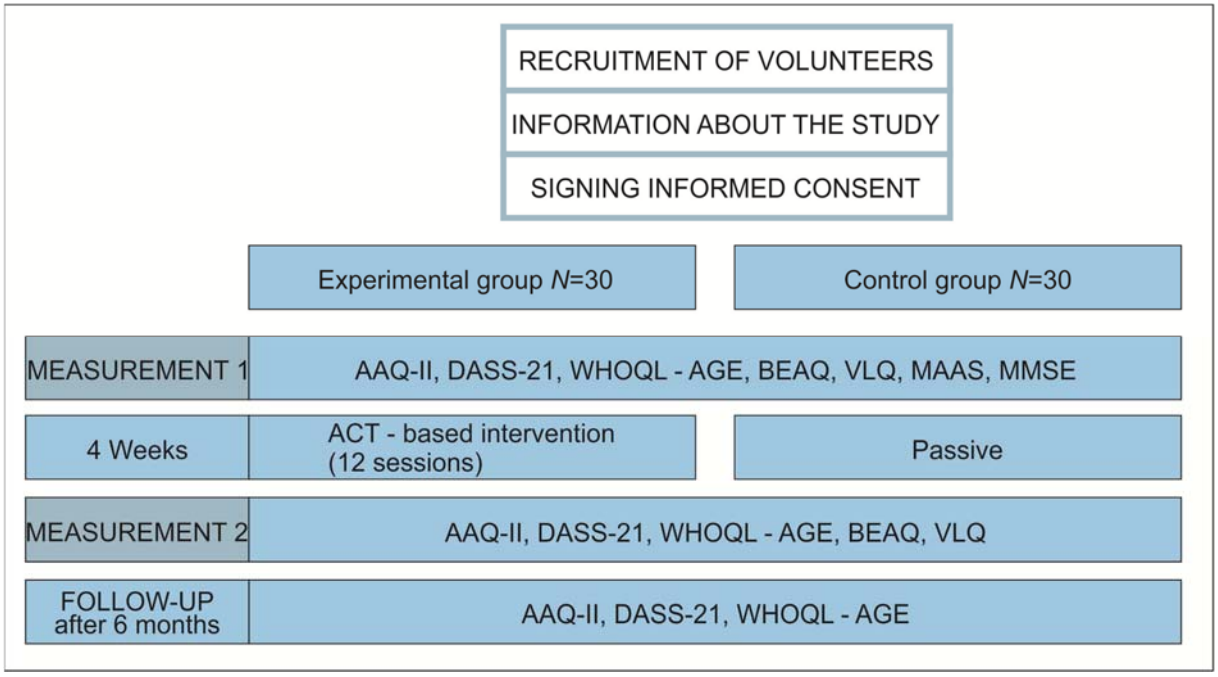
5.3. **Procedure**

The volunteers were extensively informed about the study by the researcher in the places of their daily stay. Volunteers received information about the principles of personal data protection, and they signed a consent form. They were randomly assigned to either experimental (N=30) or control group (N=30) with the use of an online-generated random sequence of numbers (random.org). The experimental group participated in the ACT-based intervention *Arte Vitae.* The control condition was inactive. Members of the experimental group received the schedule of sessions (4 weeks of training 3-4 times a week, the total of 12 sessions) which were held in the group format. Any absences from the session were made up individually so that all the participants went through an identical training programme based

on ACT. The intervention was conducted by a psychologist trained in ACT therapy. All participants filled in a personal data form and then completed questionnaires at baseline and at post-intervention at 1 month (second measurement straight after the intervention in the experimental group). The questionnaires were administered in person. Members of the control group received the books with the intervention protocol (with the *Arte Vitae* programme accompanied by the recordings on the webpage: (www.artevitae.pl) for their personal use after having completed the second measurement. Figure 6 shows the procedure of Study 1 and Figure 7 presents the diagram flow of Study 1.

Figure 6

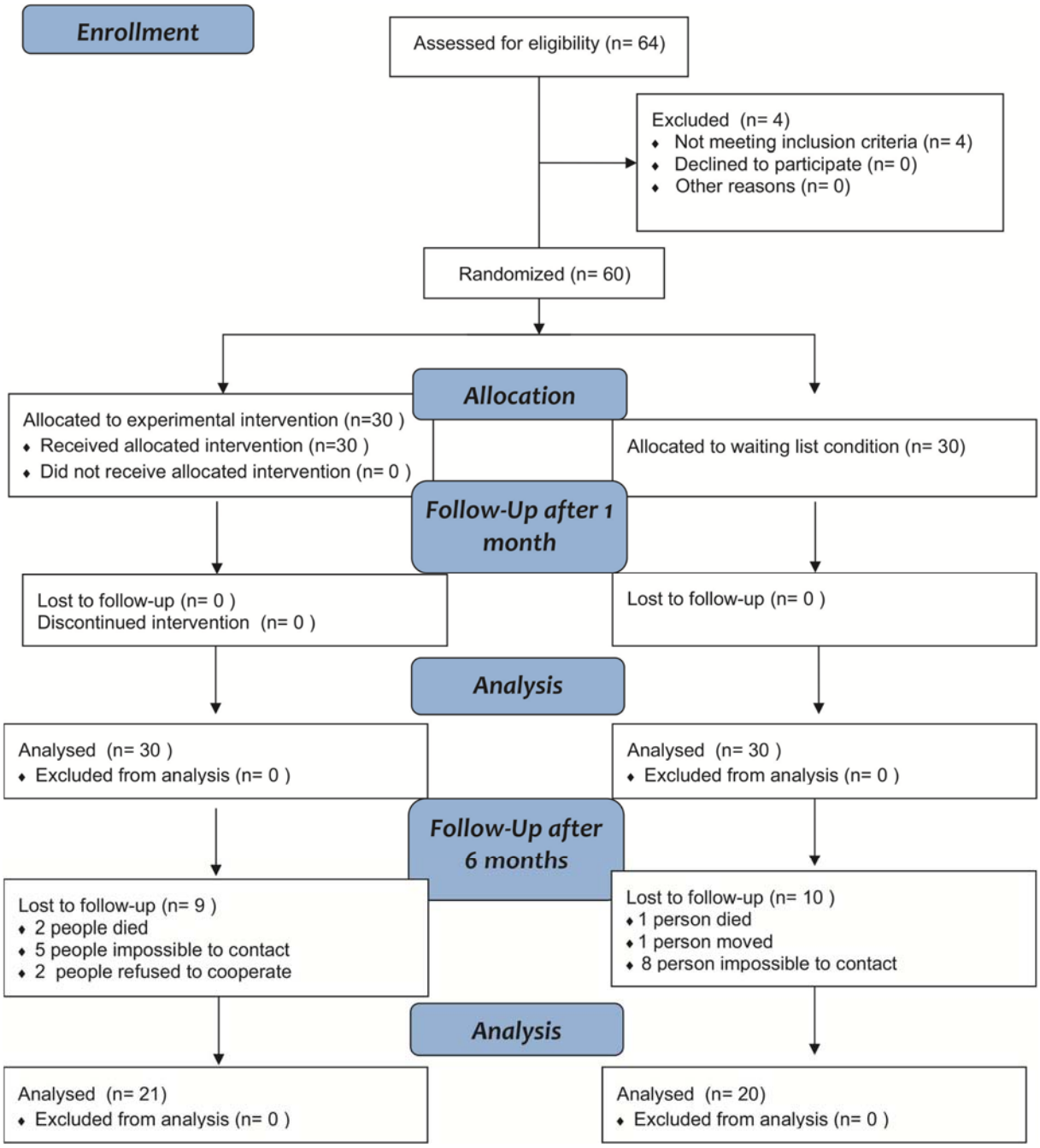
The Procedure of Study 1



Note. AAQ-II - Acceptance and Action Questionnaire; DASS-21 - Depression Anxiety & Stress Scale; WHOQL-AGE - World Health Organization Quality Of Life –AGE scale; BEAQ - Brief Experiential Avoidance Questionnaire; VLQ- Valued Living Questionnaire; MAAS - Mindful Attention Awareness Sclae; MMSE - Mini Mental State Examination

Figure 7

Flowchart of Study 1 Participants



Note. Follow-up after 1 month - 2 measurement (1 month after the baseline measurement); Follow-up after 6 months - 3 measurement (6 months after the 2 measurement).

5.4. **Measures**

Depression Anxiety & Stress Scale (DASS-21; Lovibond & Lovibond, 1995) was chosen to assess the primary outcome measures: symptoms of depression, anxiety and psychological stress. DASS-21 is the shortened version of DASS-42. The psychometric properties of the Polish version of the DASS-42 were confirmed to be satisfactory (Makara-Studzińska et al., 2022b). DASS-21 focuses on the dimensional concept of mental disorders. The emotional syndromes like depression and anxiety differ along a continuum of severity and are also present in non-clinical populations in milder forms. The depression construct consists of items referring to low self-esteem, hopelessness, devaluation of life, self-deprecation and inertia. The core anxiety symptom is physiological arousal and the stress symptomatology comprises difficulty relaxing, tension, impatience, irritability and restlessness. DASS-21 is a self-report tool enabling assessment of psychopathological symptoms especially for individuals experiencing sub-threshold manifestations of specific disorders. It measures depression, anxiety and stress signals over the previous week on three 7-item subscales, which overall scores are calculated as the sum of relevant items. The answers are presented on a 4-point Likert scale. Cut- off scores correspond to severity of symptoms, ranging from “normal” to “extremely severe” and are presented in Table 3.

Table 3

Cut-off Scores for Depression, Anxiety and Stress Constructs in DASS-21

	Depression	Anxiety	Stress
Normal	0-4	0-3	0-7
Mild	5-6	4-5	8-9
Moderate	7-10	6-7	10-12
Severe	11-13	8-9	13-16
Extremely severe	14 +	10+	17+

The DASS-21 subscales can validly be used to measure the dimensions of depression, anxiety, and stress. The Cronbach's alpha values of the DASS-21 scales were 0.88 for Depression subscale, 0.82 for Anxiety subscale, 0.90 for Stress subscale, and 0.93 for the Total scale (Henry & Crawford, 2005). For the Polish version of DASS-21 the Cronbach's alpha values equaled to 0.86 for Depression subscale, 0.84 for Anxiety subscale, 0.85 for Stress subscale and 0.93 for the Total scale (Makara-Studzińska et al., 2022a).

World Health Organization Quality Of Life –AGE scale (WHOQL- AGE; Zawisza, Gałaś & Tobiasz-Adamczyk, 2016) was used to measure quality of life with the special consideration of aspects relevant to older people. The consent was obtained from WHO for using the tool in the research. In validation studies administered to nationally representative samples (n = 9987) of older adults from Finland, Poland, and Spain, the WHOQOL- AGE was confirmed to be a short instrument that can be used in population surveys assessing the quality of life in older adults, the relationship between quality of life and health and other factors and as a tool to measure the impact of interventions (Caballero et al., 2013). In the study the reliability and validity of the instrument was confirmed: for the entire scale, Cronbach's alpha values were 0.87 in Finland, and 0.91 in Poland and Spain. The Polish validation (Zawisza, Gałaś & Tobiasz-Adamczyk, 2016) confirmed the validity and reliability of the scale to measure quality of life by older adults and its psychometric

properties and short and uncomplicated construction make the tool applicable for large surveys. The overall score is calculated as the sum of all items – the higher score, the higher quality of life. The WHOQOL-AGE was chosen for the study due to its time efficiency and taking into account the specificity of ageing.

Acceptance and Action Questionnaire (AAQ-2; Bond et al., 2011) was administered to assess psychological flexibility. The 7-item questionnaire has satisfactory internal consistency (Kleszcz et al., 2018). The items are presented on a 7 -point Likert-type scale. Low scores indicate greater acceptance and action (greater psychological flexibility), while high scores reflect greater experiential avoidance and immobility (lower psychological flexibility). The seven-item version of AAQ-II which was initially intended as a ten-item scale, demonstrates the satisfactory psychometric properties. From a diverse sample of 2,816 individuals, the AAQ-II demonstrated satisfactory structure, reliability and validity. Results demonstrated a mean α coefficient of 0.84 (range 0.78 - .088), and 3-month (.81) and 12-month (0.79) test-retest reliability.

Brief Experiential Avoidance Questionnaire (BEAQ; Gámez et al., 2014) was administered to measure experiential avoidance. In the study the Polish experimental version by Kruszewska, Wytykowska (2018) was used. The tool assesses the broad range of experiential avoidance content and may be interpreted as an equivalent of psychological inflexibility.

Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003). Polish version elaborated by Radoń (2014) was used to assess mindfulness as a trait, which is characterised as a receptive state of mind in which attention, informed by a sensitive awareness of what is occurring in the present. MAAS focuses on the presence or absence of attention and awareness of the moment to moment experience – it assesses mainly one aspect of mindfulness, characterised as mindful presence. The instrument can be used with people

with no experience in meditation both from clinical and non-clinical samples. The scale comprises 15 statements with 6- point Likert scale. The higher the score calculated as the mean of the items, the higher the mindfulness trait of the respondent (Radoń, 2014).

Valued Living Questionnaire (VLQ; Wilson & Groom, 2002) was used to measure values construct. In the research the Polish experimental version was used (Wytykowska, Chojak, 2020). The respondents are asked to rate 10 areas of life on the scale of 1-10, indicating the level of their importance and whether respondents pursued these values in their lives in the past week. These domains are as follows: 1. Family, 2. Marriage/couples/intimate relations, 3. Parenting, 4. Friendship, 5. Work, 6. Education, 7. Recreation, 8. Spirituality, 9. Citizenship, and 10. Physical self- care. Respondents are asked to rate the 10 areas of life on a scale of 1–10, indicating the level of importance and how consistently they have lived in accord with those values in the past week.

The Mini–Mental State Examination (MMSE; Folstein, Folstein & McHugh, 1975) in Polish version by Stańczyk (2010) was administered in the study to assess the level of cognitive functioning. In general, the MMSE is a brief screening test that quantitatively measures the severity of cognitive impairment and report cognitive decline occurring over time The validation of the tool demonstrated high levels of sensitivity for moderate to severe cognitive impairment and lower levels for mild degrees of impairment (Folstein, Folstein & McHugh,1975). The Polish validation showed high reliability and validity (Stańczyk, 2010). The tool measures such functions as registration, attention, calculation, recall, language, ability to follow simple commands and orientation (Tuijl et al., 2012). The limitations of the use of this tool is its highly verbal content, lacking sufficient measuring of visuospatial and constructional praxis, and its sensitivity to demographic factors, mainly age and education have the greatest effect (Tombaugh & McIntyre, 1992).

5.5. **Statistical analyses**

The statistical analyses were performed with the use of IBM SPSS Statistics 26.0 programme. The main hypotheses of this study were tested with evaluating the differences in the level of psychopathological symptoms and quality of life for the initial and the final measurement, and between the experimental and the control group with 2 x 2 repeated measures analysis of variance ANOVA (2 groups x 2 measurements). For the purpose of the analyses the significance level $\alpha = .05$ was assumed. Training was the inter-object factor, whereas the intra-group factor was the measurements of the quality of life and psychopathological symptoms at the beginning of the research and after a month. The analyses were conducted for the results of WHOQOL – AGE and for the depression, anxiety and psychological stress subscales of DASS-21. Next the mediation models were tested in order to indicate if any of the following variables: psychological flexibility, experiential avoidance, mindfulness (contact with the present moment) and values constituted the mechanism of change in the outcome variables.

Finally, the moderation models were tested to verify the hypotheses concerning the moderating role of cognitive functioning in change between the baseline and post-intervention measurements of the psychopathological symptoms and the quality of life.

5.6. **Results**

In the first step the descriptive statistics were calculated together with Shapiro-Wilk tests of normality. The analyses were held separately for the control and experimental group and the results are presented in Tables 4 and 5.

In the control group there were no statistically significant deviations of the following variables from the normal distribution: quality of life in both measurements, psychological flexibility in both measurements, mindfulness in both measurements, experiential avoidance

in both measurements, depressive symptoms in both measurements and anxiety symptoms in the second measurement. In the experimental group there were no statistically significant deviations of the following variables from the normal distribution: quality of life in first measurement, psychological flexibility in first measurements, mindfulness in both measurements and experiential avoidance in both measurements. The distribution of the remaining variables slightly diverged from normal. Nevertheless, the overall value of skewness for those variables was not higher than 2, i.e. the divergence from normal distribution was not significant (George, Mallery, 2016).

Table 4

Descriptive Statistics with Tests of Normality in the Control Group in the Baseline and Second Measurements

	M	*Me*	*SD*	*Sc.*	*Curt.*	*Min.*	*Max.*	*W*	*p*
Quality of life - measurement 1	45.93	46.00	6.89	-.41	.76	27.00	59.00	.98	.811
Quality of life - measurement 2	44.63	45.50	6.66	-.38	-.25	28.00	56.00	.97	.542
Psychological flexibility – measurement 1	23.93	23.50	8.94	.10	-.84	9.00	42.00	.97	.677
Psychological flexibility – measurement 2	21.27	23.00	8.82	.21	-.70	7.00	39.00	.97	.457
Mindfulness – measurement 1	62.10	62.00	15.18	-.94	2.05	15.00	89.00	.95	.163
Mindfulness – measurement 2	65.63	64.50	14.49	-.35	-.19	30.00	88.00	.97	.580
Experiential avoidance – measurement 1	69.83	70.50	9.49	-.67	.88	43.00	86.00	.97	.451
Experiential avoidance – measurement 2	61.40	64.50	13.52	-.51	-.18	33.00	87.00	.95	.129
Cognitive functioning	27.10	27.00	2.90	-2.18	5.69	17.00	30.00	.76	<.001
Depressive symptoms – measurement 1	5.23	5.50	3.31	.56	.43	.00	13.00	.95	.132
Depressive symptoms – measurement 2	5.03	4.50	3.82	0.37	-.95	.00	13.00	.94	.078
Anxiety symptoms-measurement 1	5.23	5.00	3.70	1.03	1.83	.00	16.00	.92	.023
Anxiety symptoms-measurement 2	5.30	5.00	3.74	.53	-.44	.00	14.00	.95	.185

	M	*Me*	*SD*	*Sc.*	*Curt.*	*Min.*	*Max.*	*W*	*p*
Stress symptoms-measurement 1	6.13	5.50	4.37	.68	-.48	.00	16.00	.93	.041
Stress symptoms-measurement 2	6.07	5.00	4.33	.19	-1,48	.00	13.00	.90	.010

Table 5

Descriptive Statistics with Tests of Normality in the Experimental Group in the Baseline and Second Measurements

	M	*Me*	*SD*	*Sc*	*Cur.*	*Min*	*Max.*	*W*	*p*
Quality of life - measurement 1	46.47	47.00	8.27	-.72	.54	25.00	60.00	.95	.172
Quality of life - measurement 2	51.87	53.50	7.99	-1.29	2.27	26.00	63.00	.90	.007
Psychological flexibility – measurement 1	22.80	23.00	10.94	.30	-.66	8.00	47.00	.94	.121
Psychological flexibility – measurement 2	21.03	18.50	11.38	.50	-1.05	8.00	45.00	.90	.009
Mindfulness – measurement 1	64.30	63.00	11.05	.16	-.98	45.00	86.00	.97	.507
Mindfulness – measurement 2	70.63	70.00	12.24	-.11	-1.27	50.00	89.00	.94	.085
Experiential avoidance – measurement 1	64.97	65.00	12.53	.00	-.23	39.00	90.00	.99	.973
Experiential avoidance – measurement 2	55.90	60.00	12.99	-.74	-.15	23.00	75.00	.93	.064
Cognitive functioning	27.50	28.00	2.30	-2.39	9.46	18.00	30.00	.76	<.001
Depressive symptoms – measurement 1	4.33	3.00	3.94	1.10	.12	.00	13.00	.85	<.001
Depressive symptoms – measurement 2	3.17	2.50	2.90	.56	-.77	.00	10.00	.89	.005
Anxiety symptoms-measurement 1	4.40	3.00	3.78	1.05	.76	.00	15.00	.90	.009
Anxiety symptoms-measurement 2	2.67	2.00	2.51	.97	.32	0.00	9.00	.89	.004
Stress symptoms-measurement 1	6.53	5.00	5.11	.96	-.11	.00	18.00	.87	.002
Stress symptoms-measurement 2	4.00	3.00	3.24	1.17	.75	.00	13.00	.87	.001

In order to verify whether the effects of the intervention sustained after 6 months, the data from the follow up were analysed. The descriptive statistics for the follow up measurement are presented in Table 6.

Table 6

Descriptive Statistics with Tests of Normality in the Follow-up After 6 Months After Second Measurement

	M	*Me*	*SD*	*Sc.*	*Curt.*	*Min.*	*Max.*	*W*	*p*
Control group									
Symptoms of depression	8.30	7.00	5.32	.28	-1.32	.00	17.00	.92	.109
Symptoms of stress	7.50	7.,50	4.73	.05	-1.26	.00	15.00	.95	.359
Symptoms of anxiety	6.25	6.50	3.73	.39	-.75	1.00	14.00	.94	.234
Quality of life	39.65	39.00	7.14	.18	.20	25.00	54.00	.97	.798
Psychological flexibility	25.65	24.50	8.99	.30	.64	8.00	47.00	.98	.960
Experimental group									
Symptoms of depression	7.86	7.00	4.71	.42	.09	.00	19.00	.98	.872
Symptoms of stress	7.57	7.00	5.87	.07	-1.29	.00	18.00	.92	.088
Symptoms of anxiety	4.81	5.00	3.36	.56	-.73	1.00	11.00	.90	.036
Quality of life	46.10	46.00	6.41	-.76	.53	31.00	56.00	.95	.296
Psychological flexibility	22.05	23.00	8.81	.32	-.75	10.00	39.00	.93	.171

5.6.1. **Testing of hypothesis 1**

Hypothesis 1: The ACT-based training will be effective in increasing the quality of life.

The main effect for measurement was statistically significant, $F(1, 58) = 12.53$, $p = .001$, $\eta_p^2 = .18$. The main effect for the training, the inter-object factor, was also significant, $F(1, 58) = 4.43$, $p = .040$, $\eta_p^2 = .07$. The interaction of both factors was significant too, $F(1, 58) = 33.45$, $p < .001$, $\eta_p^2 = .37$.

The analysis showed that the level of quality of life measured after a month was significantly higher than in the initial measurement, $F(1, 58) = 12.53$, $p = .001$, $\eta^2 = .18$. People in the control group reported a lower level of quality of life than people in the experimental group, $F(1, 58) = 4.43$, $p = .040$, $\eta^2 = .07$. The initial level of quality of life did not differ between groups $F(1, 58) = .07$, $p = .787$, $\eta^2 < .01$, but the quality of life of people in the experimental group was significantly higher than of people from the control group after one month, $F(1, 58) = 14.50$, $p < .001$, $\eta^2 = .20$.

There was a significant difference in the quality of life between the measurements in the experimental group, $F(1, 58) = 43.46$, $p < .001$, $\eta^2 = .43$. After a month of training, the level of quality of life in this group increased significantly. The same effect was not observed in the control group, $F(1, 58) = 2.52$, $p = .118$.

The analyses presented above confirm Hypothesis 1 about the effectiveness of ACT-based intervention in increasing the quality of life.

Quality of life in the follow-up

The following analysis of data from the follow-up (6 months after the second measurement) were conducted in order to verify whether the aforementioned effects were stable in time. The analysis showed that the main effect for the measurement was significant, $F(1, 39) = 23.21$, $p < .001$, $\eta_p^2 = .37$. The main effect for the inter-object factor, the training, was insignificant $F(1, 39) = 2.09$; $p = .156$, $\eta_p^2 = .05$. The interaction of both factors was also insignificant $F(1, 39) = 2.13$, $p = .153$, $\eta_p^2 = .05$.

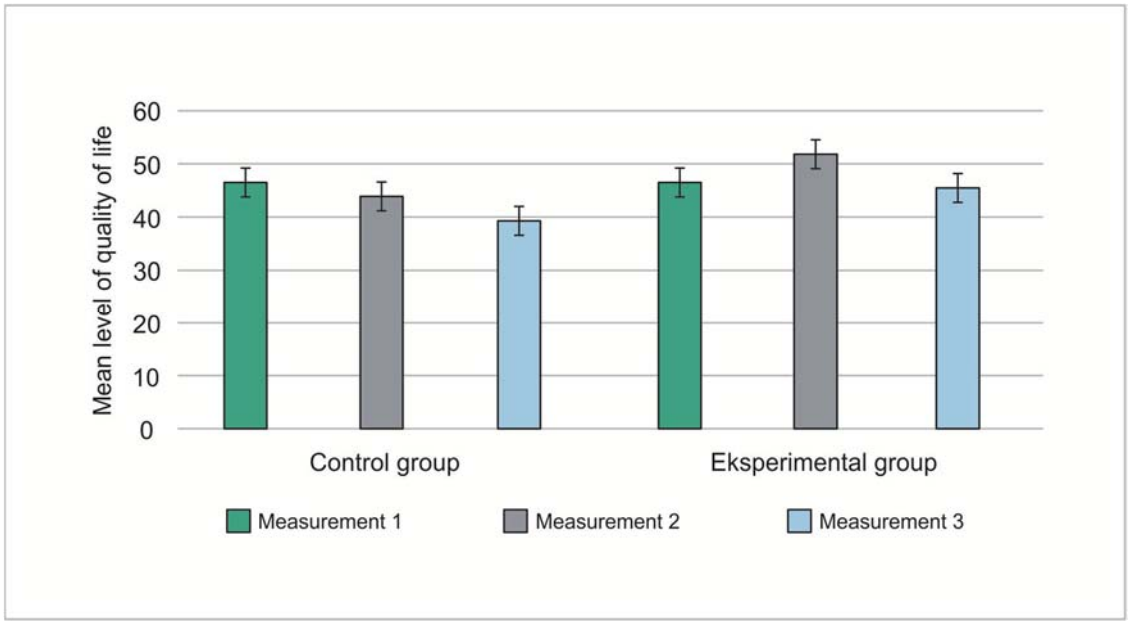
The level of quality of life for the follow up was significantly lower than in the second measurement, $F(1, 39) = 11.39$, $p = .002$, $\eta^2 = .23$. People from the control group reported lower levels of quality of life than persons from the experimental group, $F(1, 39) = 17.49$, $p < .001$, $\eta^2 = .31$. The simple effects analysis showed statistically significant differences between

groups in the second $F(1, 39) = 12.86$, $p = .001$, $\eta^2 = .25$ and third measurement $F(1, 39) = 9.27$, $p = .004$, $\eta^2 = .19$. In the control group the level of the quality of life was significantly lower than in the experimental group in both measurements.

The significant difference between measurements occurred in experimental group $F(1,39) = 8.89$, $p = .005$, $\eta^2 = .19$, whereas there was no significant change in the control group between measurements, $F(1,39) = 3.27$, $p = .078$, $\eta^2 = .08$. In the follow-up the quality of life of researched people in the experimental group decreased in comparison to second measurement. The effects of ACT-based intervention did not remain until follow-up as far as the quality of life is concerned. The means and standard deviations for the analysed effects are presented in Figure 8.

Figure 8

The Means and Standard Deviations for the Level of Quality of Life



Note. Measurement 1 - baseline measurement, Measurement 2- measurement after 1 month from the baseline measurement, Measurement 3 - measurement after 6 months from the Measurement 2

5.6.2. **Testing of hypothesis 2**

Hypothesis 2: The ACT-based training will be effective in the reduction of the psychopathological symptoms.

The baseline mean level of depression according to DASS norms was just above the cut-off score of „normal" in the experimental group and referred to as „mild" in the control group. The mean level of anxiety symptoms in the baseline measurement in both groups referred to „mild anxiety". The mean level of psychological stress was „normal" in both groups in the first measurement, however its level was at the verge of the cut-off score. The degree of severity of symptoms in the baseline measurement according to cut-off scores for defining the severity of symptoms measured by DASS are presented in Table 7.

Table 7

The Severity and Distribution of Psychopathological Symptoms in Baseline Measurement

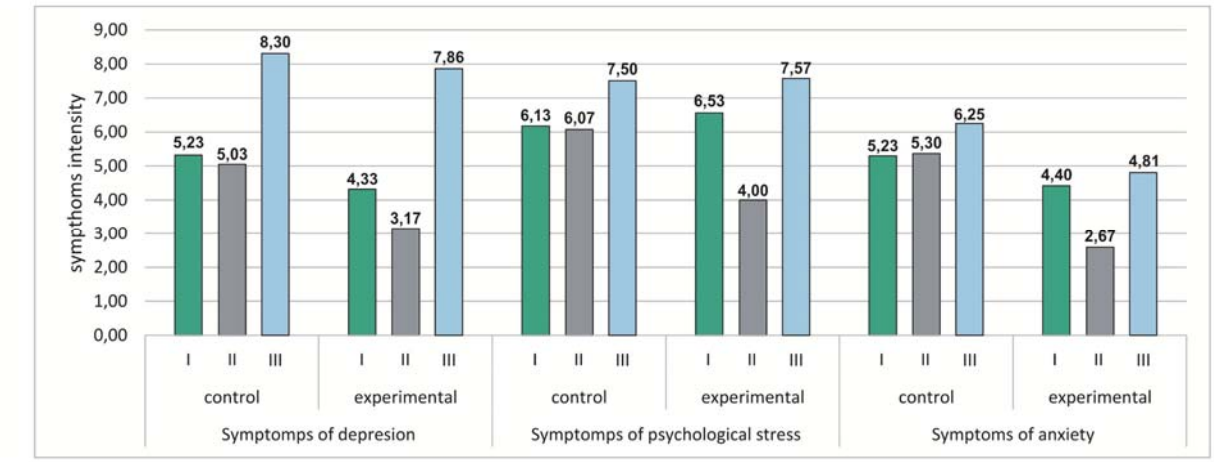
Level of severity of symptoms	Frequency (%)				
	Normal	Mild	Moderate	Severe	Extremely severe
Anxiety	41.7	20	16.6	13.4	8.3
Depression	56.7	16.6	16.7	10	0
Stress	70	10	15	13.3	1.7

Although the mean level of psychopathological symptoms at baseline was not alarming, it is worth noticing that 38,3% of participants experienced from moderate to extremely severe levels of anxiety, 17,7 % suffered from moderate to extremely severe depression, and 30 % experienced from moderate to extremely severe level of psychological stress.

The changes in psychopathological symptoms between consecutive measurements are presented in Figure 9.

Figure 9

The Changes in Symptoms Between Measurements in Both Training Groups



Note. I - baseline measurement, II- measurement after 1 month from the baseline measurement, measurement after 6 months from the second measurement (II)

Symptoms of depression. The main effect of measurement was insignificant, $F(1, 58) = 3.37$, $p = .072$, $\eta^2 = .06$. The symptoms of depression after a month were not significantly different from the initial ones. Also the main effect for the training, the inter-object factor, was insignificant, $F(1, 58) = 2.79$, $p = .100$, $\eta^2 = .05$. People from the group participating in the training were not significantly different from the people in the control group as far as depressive symptoms were concerned. The interaction of both factors was also insignificant, $F(1, 58) = 1{,}68$, $p = .200$, $\eta_p^2 = .03$.

The analysis of simple effects for training showed significant differences between the groups for the depressive symptoms after a month, $F(1, 58) = 4.54$, $p = .037$, $\eta^2 = .07$. People in the experimental group displayed a significantly lower level of depressive symptoms than people in the control group. The differences between groups in the initial measurement were insignificant, $F(1, 58) = .92$, $p = .342$, $\eta^2 = .02$.

The analysis of the simple effect for the measurement did not show significant differences in the level of depressive symptoms among the control group, $F(1, 58) = 0{,}14$, $p = .706$, $\eta^2 < .01$, whereas in the experimental group the difference was significant, $F(1, 58) =$

4.90, $p = .031$, $\eta^2 = .08$. After a month of training, the level of depressive symptoms in this group decreased significantly.

Symptoms of depression in the follow-up. The analysis showed the significant main effect for the measurement $F(1, 39) = 23{,}21$, $p < .001$, $\eta^2 = .37$. The main effect for the inter-object factor – the training – was insignificant $F(1, 39) = 2.09$, $p = .156$, $\eta^2 = .05$. The interaction of both factors was also insignificant $F(1, 39) = 2.13$, $p = .153$, $\eta^2 = .05$.

The level of depressive symptoms in the second measurement was significantly lower than in the follow-up, $F(1, 39) = 23.21$, $p < .001$, $\eta^2 = .37$. Persons from the experimental group did not differ significantly from the people from the control group in the level of depressive symptoms at follow-up, $F(1, 39) = 2.09$, $p = .156$, $\eta^2 = .05$.

The analysis of simple effects for measurement showed significant differences in the level of depressive symptoms both in the experimental $F(1, 39) = 20.18$, $p < .001$, $\eta^2 = .34$, and in the control group $F(1, 39) = 5.51$, $p = .024$, $\eta^2 = .12$. The level of depressive symptoms was significantly lower in the second measurement than in the follow-up in both groups.

Summing up, the analysis showed that the effects of the ACT-based training on the lowering of depressive symptoms did not endure in the 6-month period.

Symptoms of anxiety. The main effect for measurement was significant, $F(1, 58) = 5.08$, $p = .028$, $\eta^2 = .08$. The level of anxiety symptoms decreased significantly between measurements. The main effect for the training, the inter-object factor, was also significant, $F(1, 58) = 4.49$, $p = .038$, $\eta^2 = .07$. The interaction of both factors was significant too, $F(1, 58) = 5.93$, $p = .018$, $\eta^2 = 0{,}09$. Although the groups did not differ significantly in the level of anxiety in the first measurement, $F(1, 58) = .74$, $p = .392$, $\eta^2 = .01$, the significant difference appeared in the second measurement $F(1, 58) = 10.24$, $p = .002$, $\eta^2 = .15$. People from the training group showed a lower level of anxiety symptoms than the people in the control group.

The difference in anxiety symptoms between measurements was significant for the experimental group, $F(1, 58) = 10.99$, $p = .002$, $\eta^2 = .16$. After a month of training, the level of anxiety symptoms in this group was significantly reduced. The same pattern was not observed in the control group, $F(1, 58) = .02$, $p = .899$, $\eta^2 < .01$

According to DASS norms, the anxiety level in the experimental group decreased from "mild" to "normal" between the measurements, while the control group remained at the same level of symptoms ("mild").

Anxiety symptoms in the follow-up. The statistical analysis did not show a significant main effect for measurement, $F(1, 39) = 2.10$, $p = .155$, $\eta^2 = .05$. The main effect for the training was significant $F(1, 39) = 13.64$, $p = .001$, $\eta^2 = .26$. The interaction of both factors was insignificant $F(1, 39) = 3.20$, $p = .081$, $\eta^2 = .08$.

The level of anxiety symptoms did not change significantly between measurements, $F(1, 39) = 2.10$, $p = .155$, $\eta^2 = .05$. However, people in the experimental group experienced lower levels of anxiety symptoms than participants of the control group, $F(1, 39) = 13.64$, $p = .001$, $\eta^2 = .26$. The simple effects analysis did not show significant differences between groups in the follow-up $F(1, 39) = 1.70$, $p = .201$, $\eta^2 = .04$. The significant difference in anxiety symptoms between measurements occurred in the experimental group, $F(1, 39) = 5.39$, $p = .026$, $\eta^2 = .12$. In follow up the level of anxiety symptoms increased significantly in comparison to the second measurement. The same pattern was not observed for the control group $F(1, 39) = .06$, $p = .814$, $\eta^2 < .01$.

Summing up, the effects of ACT-based training in lowering anxiety symptoms did not last after 6 months.

Psychological stress symptoms. The main effect for measurement was statistically significant, $F(1, 58) = 6.86$, $p = .011$, $\eta^2 = .11$.The level of psychological stress symptoms for the second measurement was significantly lower than in the baseline measurement. The main

effect for the training, the inter-object factor, was insignificant, $F(1, 58) = .70$, $p = .407$, $\eta^2 = .01$. The interaction of both factors was significant, $F(1, 58) = 6.17$, $p = .016$, $\eta^2 = .10$.

The groups did not differ significantly in the baseline measurement, $F(1, 58) = .11$, $p = .746$, $\eta^2 < .01$, however the significant difference between the groups occurred after a month, $F(1, 58) = 4.38$, $p = .041$, $\eta^2 = .07$. Participants from the experimental group showed significantly lower levels of psychological stress symptoms after a month in comparison to persons from the control group. Additionally, after a 1-month participation in the intervention programme the level of psychological stress symptoms decreased significantly in the experimental group, $F(1, 58) = 13.03$, $p = .001$, $\eta^2 = .18$. The same pattern of change was not observed for the control group, $F(1, 58) = .10$, $p = .925$, $\eta^2 = .01$.

The analyses above showed that ACT-based intervention will lead to psychological stress symptoms reduction.

Psychological stress symptoms in the follow up. The conducted analyses demonstrated a significant main effect for the measurement $F(1, 39) = 12.47$, $p = .001$, $\eta^2 = .24$. The main effect for the training was insignificant $F(1, 39) = 1.46$, $p = .235$, $\eta^2 = .04$. The interaction of both factors was significant $F(1, 39) = 4.15$, $p = .048$, $\eta^2 = .10$.

The level of psychological stress was significantly lower in the second measurement than in the follow-up, $F(1, 39) = 12.47$, $p = .001$, $\eta^2 = .24$. The participants of the experimental group did not differ significantly from the persons from the control group in the level of psychological stress symptoms, $F(1, 39) = 1.46$, $p = .235$, $\eta^2 = .04$. In the third measurement, the differences between groups in the level of psychological stress symptoms were insignificant $F(1, 39) < .01$, $p = .966$, $\eta^2 < .01$.

The significant increase in the level of psychological stress symptoms was observed in the experimental group $F(1, 39) = 15.89$, $p < .001$, $\eta^2 = .29$, whereas the simple effects

analysis for measurement did not show significant differences in the level of stress symptoms for the participants of the control group $F(1, 39) = 1.09$, $p = .303$, $\eta^2 = .03$.

The effects of the ACT-based training did not last as far as the psychological stress symptoms are concerned.

Summing up, the analyses presented above confirmed Hypothesis 2 stating that ACT-based intervention would lead to psychopathological symptoms reduction, however, the effects of the ACT-based training did not last in the 6-month follow-up regarding psychological stress symptoms.

5.6.3. **Testing of hypothesis 3**

Hypothesis 3: The level of experiential avoidance, psychological flexibility, contact with the present moment (mindfulness), values will change significantly between measurements only in the experimental group.

In order to verify hypothesis 3, concerning the change in psychological flexibility and the selected key processes between measurements in both groups, the 2x2 repeated measures analysis of variance ANOVA (2 groups x 2 measurements) was conducted. Table 8 shows the collected descriptive statistics concerning both measurements in both groups.

Table 8

The Descriptive Statistics for the ACT Processes in the Experimental and Control Group

	M	*Me*	*SD*	*Sc.*	*Curt.*	*Min.*	*Max.*	*W*	*p*
Experimental group									
Mindfulness- measurement 1	64.30	63.00	11.05	.16	-.98	45.00	86.00	.97	.51
Mindfulness – measurement 2	70.63	70.00	12.24	-.11	-1.27	50.00	89.00	.94	.09
Psychological flexibility - measurement 1	22.80	23.00	10.94	.30	-.66	8.00	47.00	.94	.121
Psychological flexibility - measurement 2	21.03	18.50	11.38	.50	-1.05	8.00	45.00	.90	.009
Experiential avoidance – measurement 1	64.97	65.00	12.53	.00	-.23	39.00	90.00	.99	.973
Experiential avoidance – measurement 2	55.90	60.00	12.99	-.74	-.15	23.00	75.00	.93	.064
Control group									
Mindfulness- measurement 1	62.10	62.00	15.18	-.94	2.05	15.00	89.00	.95	.163
Mindfulness – measurement 2	65.63	64.50	14.49	-.35	-.19	30.00	88.00	.97	.580
Psychological flexibility - measurement 1	23.93	23.50	8.94	0.10	-.84	9.00	42.00	.97	.677
Psychological flexibility - measurement 2	21.27	23.00	8.82	.21	-.70	7.00	39.00	.97	.457
Experiential avoidance – measurement 1	69.83	70.50	9.49	-.67	.88	43.00	86.00	.97	.451
Experiential avoidance – measurement 2	61.40	64.50	13.52	-.51	-.18	33.00	87.00	.95	.129

The level of psychological flexibility did not alter significantly between measurements, $F(1, 58) = 2.46$, $p = .122$, $\eta^2 = .041$. Also the groups did not differ significantly as far as the change in the level of psychological flexibility was concerned, $F(1, 58) = .098$, $p = 0.76$, $\eta^2 = .002$ and the groups did not differ in the level of psychological flexibility in both measurements, $F(1, 58) = .101$, $p = .751$, $\eta^2 = .002$.

The same pattern was observed in the values domain. The level of values introduced into life did not change between measurements, $F(1, 58) = 1.27$, $p = .26$. The groups did not differ significantly as far as the level of values introduced into life was concerned $F(1, 58) =$

.69, p = .41, and the groups did not differ significantly with respect to the level of values introduced into life between measurements, $F(1, 58) = 1.21$, p = .28.

The level of mindfulness increased significantly between measurements, $F(1, 58) = 12.95$, p = .001, η^2= .18. However, the groups did not differ significantly in the change of the level of mindfulness, $F(1, 58) = 1.297$, p = .259, η^2= .022 and did not differ in the level of contact with the present moment in both measurements, $F(1, 58) = 1.043$, p = .311, η^2= .018.

Also the level of experiential avoidance decreased significantly between measurements, $F(1, 58) = 26.26$, p <.001, η^2= .31. The groups did not differ significantly as far as the level of experiential avoidance was concerned. However the difference was on the level of statistical trend, $F(1, 58) = 3.81$, p = .056, η^2= .06. The groups also did not differ significantly with respect to the level of experiential avoidance between measurements, $F(1, 58) = .034$, p = .85, η^2 = .001.

The analyses of the data did not confirm hypothesis 3. Although the level of mindfulness increased between measurements and experiential avoidance decreased, the changes pertained to both groups.

5.6.4. **Testing of hypothesis 4 and 5 with mediation analysis**

Hypothesis 4: The change in the level of experiential avoidance will mediate the lowering of the psychopathological symptoms and/or the increasing the quality of life.

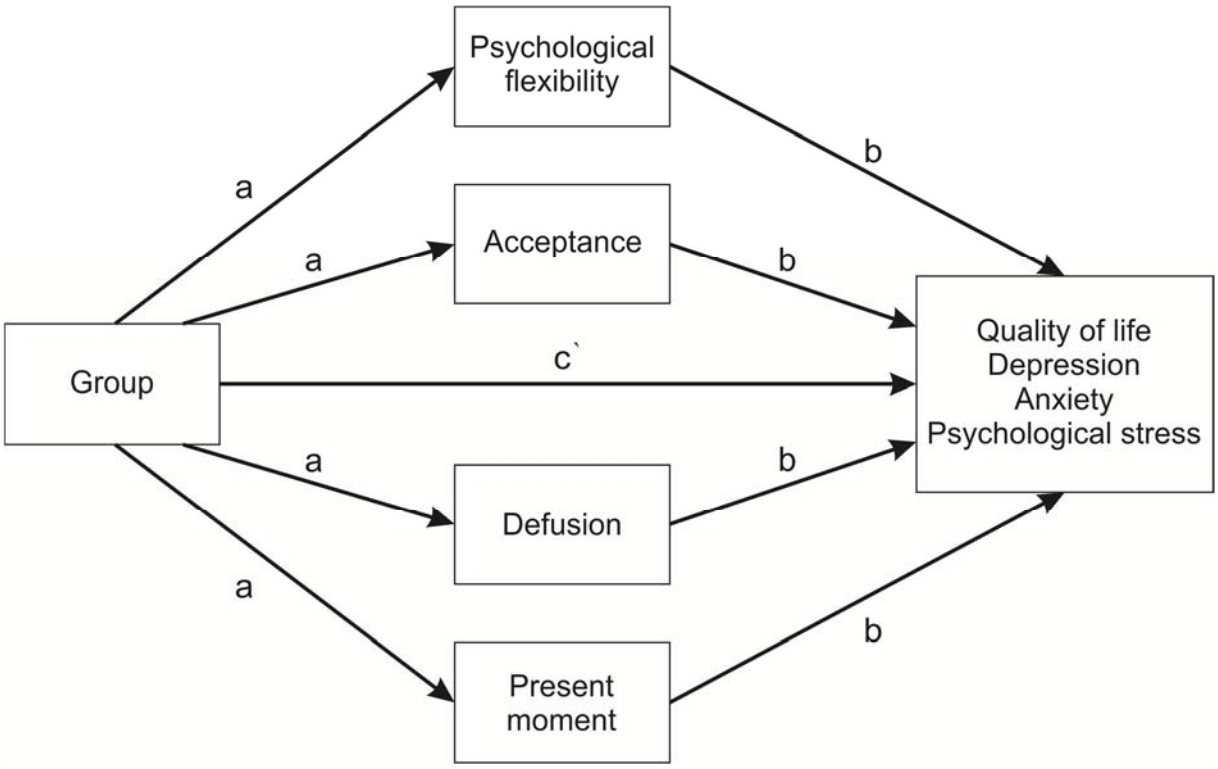
Hypothesis 5: The change in psychological flexibility and its selected components (mindfulness/values) will mediate the lowering of the psychopathological symptoms and/or the increasing of the quality of life.

Mediation analysis was performed with the use of Hayes macro Process (2018) in the model no. 4. The group membership (experimental vs control) was analysed as an explaining variable. Psychological flexibility, experiential avoidance, contact with the present moment

(mindfulness) and values were analysed as mediators. The level of the quality of life, the level of depression, stress and anxiety symptoms were analysed as explained variables. Each mediator and each explained variable was analysed in a separate model. Figure 10 presents analysed relationships between analysed variables.

Figure 10

Verified Model of Relationships Between Analysed Variables



The values from the second measurement regarding each variable were included in the analysis while controlling for the values from the first measurement. The results of the analyses are depicted in Table 9. The table presents data with 95% confidence intervals for standardised regression coefficients acquired for paths depicted in Figure 10 with the use of the bootstrap method.

Table 9

Results of Mediation Analysis

Mediator	Explained variable	a	b	c`	Indirect effect	R^2
Experiential avoidance	Depression	-.71, .25	-.01, .39	-.69, .07	-.15, .04	.52
	Psychological stress	-.71, .25	.06, .45	-.86, .08	-.19, .05	.49
	Anxiety	-.71, .25	.02, .39	-.91, -.20	-.16, .04	.57
	Quality of life	-.71, .25	-.30, -.04	.50, .99	-.03, .16	.77
Contact with the present moment (mindfulness)	Depression	-.12, .64	.37, .02	-.69, .07	-.15, .03	.51
	Psychological stress	-.12, .64	.39, .02	-.90, -.11	-.17, .02	.46
	Anxiety	-.12, .64	.38, -.02	-.92, -.20	-.18, .02	.57
	Quality of life	-.12, .64	.03, .26	.52, .99	-.02, .13	.75
Psychological flexibility	Depression	-.46, .50	.12, .47	-.72, -.02	-.14; .17	.57
	Psychological stress	-.46, .50	.07, .45	-.95, -.19	-.12, .15	.49
	Anxiety	-.46, .50	.01, .38	-.99; -.29	-.10, .12	.57
	Quality of life	-.46, .50	-.25, .05	.57; .99	-.07, .06	.75
Values	Depression	-.76, .29	.23, .16	-.77; .01	-.02, .06	.48
	Psychological stress	-.76, .29	.12, .30	-.96; -.15	-.08, .06	.43
	Anxiety	-.76, .29	.16, .21	-.99; -.26	-.04, .05	.53
	Quality of life	-.76, .29	.16, .13	.56; .99	-.03; .04	.74

Note. 95% confidence intervals for standardised regression coefficients. R^2 – determination coefficient

The statistical analyses showed that none of the mediation effects were statistically significant.

The hypotheses 4 and 5 regarding the mediating role of experiential avoidance, psychological flexibility and its selected components in lowering the psychopathological symptoms and/or increasing quality of life were not confirmed.

5.6.5. **Testing of hypothesis 6**

Hypothesis 6: The level of cognitive functioning will moderate the relationship between the first and the second measurement of the symptoms of psychological stress, depression and anxiety and of quality of life.

To test whether the level of cognitive functioning was a moderator of the relationship between the first and the second measurement of the symptoms of psychological stress, depression and anxiety the moderation models were tested, using the PROCESS macro by A. Hayes (model 1). In the model the moderator was the level of cognitive functioning measured by MMSE, the independent variable was the first measurement of anxiety and depression, and the dependent variable was the second measurement of those symptoms. The variables were subjected to centration. Cognitive functioning was divided into three levels: low, average and high, on the basis of the mean level +/- 1 SD. The analysis showed that the level of cognitive functioning measured by MMSE was not a significant moderator of the relationship between the first and the second measurement of DASS-21 dimensions. The aggregate results concerning the linear regression models with interactive components for moderative role of cognitive functioning for the relationship between the first and second measurement of depression and anxiety symptoms are presented in Table 10.

Table 10

The Linear Regression Models

	B	*SE*	*t*	*p*	*F(3,56)*	R^2
Depressive symptoms – measurement 1	.65	.10	6.81	<.001		
Cognitive functioning	.07	.14	.54	.591	15.50***	.454
Interaction	.02	.03	.66	.511		
Psychological stress symptoms – measurement 1	.49	.09	5.34	<.001		
Cognitive functioning	.07	.16	.43	.671	9.73***	.343
Interaction	<.01	.03	.11	.912		
Anxiety symptoms - measurement 1	.61	.09	6.68	<.001		
Cognitive functioning	-.21	.14	-1.50	.139	16.91***	.475
Interaction	.05	.03	1.97	.054		

Note. *$p < .05$; **$p < .01$; ***$p < .001$

The next analysed model concerned establishing the significance of cognitive functioning measured with MMSE as a moderator for the relationship between the first and the second measurement of the quality of life. The analysis did not show a significant moderation effect for the level of cognitive functioning. The interaction between this level and the first measurement of the quality of life was insignificant. The detailed results of the analyses of linear regression models with interactive components for moderative role of cognitive functioning for the relationship between the first and second measurement of quality of life are presented in Table 11.

Table 11

The Linear Regression Models

	B	*SE*	*t*	*p*	*F(3,56)*	R^2
Quality of life – measurement 1	.80	.10	8.03	<.001		
Cognitive functioning	.08	.34	.24	.813	24.46***	.567
Interaction	.03	.05	.51	.613		

Note. *p < .05; **p <. ,01; ***p < .001

The statistical analyses did not confirm hypothesis 6. Cognitive functioning was not a significant moderator of the relationship between the first and second measurement of psychological stress, depression and anxiety and quality of life.

5.7. Discussion

Interpretation of findings. The aim of the study was assessing the effectiveness of an ACT-based intervention among older adults in Poland. This objective was obtained by conducting statistical analysis of the data from the study. The efficacy was operationalized as increasing the quality of life and/or lowering psychopathological symptoms among participants of the experimental condition, which was included in the main hypotheses.

In the current study the hypothesis 1 was confirmed: the level of quality of life increased significantly post treatment only in the experimental group. Hitherto, there is scarce up to date research assessing the effectiveness of ACT intervention in fostering wellbeing in older adults in non-clinical samples. In one of the existing studies (Witlox et al., 2021), scores for positive mental health slightly increased from posttreatment to 1-year follow-up among adults participating in ACT intervention. Although the evidence on efficacy of ACT-based programmes in enhancing well-being among older adults is scarce, there is a growing body of research confirming it in clinical and non-clinical samples (Boettcher et al., 2014; Fledderus

et al., 2010; Azkhosh et al., 2016; Bayati et al., 2017; Gr´egoire et al., 2018; Pots et al., 2016; Rasanen et al., 2016; Thorsell et al., 2011).

The results of statistical analyses presented in the previous chapter confirmed also the hypothesis 2: the intervention was effective in lowering symptoms of depression, anxiety and psychological stress in the experimental group. The similar statistically significant effect was not found in the inactive control group.

The baseline mean levels of psychopathological symptoms was at the normal or mild level, however there was a group of participants who experienced the symptoms at moderate, severe or extremely severe level according to DASS-21 norms. These data legitimize implementing the intervention among older adults. The literature survey also provides rationale for supporting this population with preventive or supportive interventions, due to the prevalence of anxiety and depression, also at subsyndromal level in this age group (Fiske et al., 2009; Sjöberg et al., 2017; Bryant, Jackson, & Ames, 2008; Wolitzky-Taylor et al., 2010; Volkert et al., 2013; Witlox et al. 2018; Witlox et al., 2021). Despite the high rates of prevalence of problematic symptomatology, this age group is not delivered with the adequate mental health treatment and counselling (Swartz et al., 1998; Wang et al., 2018; Wolitzky-Taylor, 2010; Diefenbach, 2003; Voshaar, 2013; Wuthrich & Frei, 2015). Thus the results of the current study validate the effectiveness of ACT-based interventions in addressing psychopathology in older individuals. These results are consistent with the previous research on the effectiveness of ACT interventions among older adults. In the research by Witlox et al. (2021) the significant lowering of anxiety and depression symptoms was observed after blended ACT therapy sessions, which consisted of participation in the web-based ACT-programme and 4 face-to-face sessions with a mental health counsellor at the general practice. The similar results were obtained in RCT among older adults living in long-term facilities (Davison et al., 2017). The significant reduction in depression was observed after

participating in ACT-based intervention. The reduction in depression also occurred among older adults participating in ACT intervention in the study by Wetherell et al. (2011), however in this group the lowering of anxiety did not take place. The levels of depression and pain-related anxiety also decreased in the research of older adults with chronic pain, in which the intervention programme combined the premises of ACT and SOC (Alonso-Fernandez et al., 2016).

The most recent systematic review of the literature concerning the therapeutic effects of ACT on anxiety in older adults (Delhom, Mateu-Mollá, & Lacomba-Trejo, 2022) reported seven studies including the two described above (Davison et al., 2016; Witlox et al., 2021a) and studies by Fowler et al. (2021), Gould et al. (2021), Jacobs, Luci, & Hagemann (2018), Lappalainen et al. (2021) and the current study (Chojak, 2021). The results from the review confirmed that ACT can be beneficial for addressing problematic anxiety in older adults. Due to the limited number of the high quality studies available, the authors of the review suggest further research in this domain.

A wide body of research shows that ACT is effective due to the core processes of change involved in building psychological flexibility (Hayes et al., 2006; Levin et al., 2012; Pots et al., 2016). In the current study the change in psychological flexibility, contact with the present moment and values between measurements in both groups was assessed. The change in experiential avoidance, operationalized as the equivalent of psychological inflexibility, was also measured. The change in these factors was hypothesised in experimental group (hypothesis 3), however the analysis of the data did not confirm it. Further analyses pertained to verifying if the change in psychological flexibility and its selected components (mindfulness and values), and in experiential avoidance would mediate the lowering of the psychopathological symptoms and increasing quality of life (hypothesis 4 and 5). The analysis did not confirm the hypothesis 4 and 5, with the exception of experiential avoidance

which was mediator of the change in psychological stress symptoms. The results are contrary to the existing research. For example, meta-analysis assessing the functions of core ACT processes reviewed in 66 laboratory-based component studies (Levin et al., 2012) showed significant effect sizes for acceptance, contact with the present moment and values as compared to inactive control components.

One of the explanations of the lack of mediation effects of the process variables may be due to the limitations of the instruments used to measure core ACT processes, specifically psychological flexibility. While the design of this study was prepared, most of the previous research on the effectiveness of ACT interventions had been based on two self-report measures of psychological inflexibility, the Acceptance and Action Questionnaire AAQ-II (Bond et al., 2011) and the Brief Experiential Avoidance Questionnaire (BEAQ; Gámez et al., 2014), which are used as a proxy for psychological flexibility (e.g., Kashdan et al., 2020; Rochefort et al., 2018; Tyndall et al., 2019). However, the recent research shows that the AAQ-II and the BEAQ exhibits poor discriminant validity and is more strongly related to measures of general distress and some symptoms of psychopathology such as depression and anxiety rather than psychological inflexibility or psychological flexibility by proxy (Doorley et al., 2020; Kashdan et al., 2020; Rochefort et al., 2018; Tyndall et al., 2019; Landi et al., 2021). The exploratory and confirmatory factor analyses in recent research (Landi et al., 2021) showed that the six psychological flexibility processes of the MPFI loaded on a psychological flexibility factor, while anxiety, depression and the AAQ-II loaded on a distress factor. This proves the discriminant validity of the MPFI in assessing psychological flexibility. Due to the aforementioned findings, the AAQ-2 is criticised that it assess the inner experiences to which people are referring rather than measuring the ability to respond to this experience In an ACT-based research it is essential to assess how people respond to unwanted and difficult thoughts and feelings rather than measuring the distress and psychopathological

symptoms ((e.g., Kashdan et al., 2020; Tyndal et al., 2019; Landi et al., 2021). The AAQ-II and the BEAQ also received some criticism as these tools assess the construct of psychological flexibility at the global level rather than exploring the six overlapping and interrelated core ACT processes that lay foundation to this multidimensional concept (Rolffs et al., 2016). In order to fill the methodological gap in assessing the global psychological flexibility and inflexibility and each of their respective six sub-processes (acceptance, present moment awareness, self-as-context, defusion, values, committed action) the Multidimensional Psychological Flexibility Inventory (MPFI; Rolffs et al., 2016) was developed. The MPFI psychological flexibility scale showed good discriminant validity in relation to distress (Landi et al., 2021). It is a novel, reliable and effective tool measuring the psychological flexibility and inflexibility with good internal consistency and convergent and concurrent validity (Lin et al., 2019; Gregoire et al., 2020; Seidler et al., 2020; Seidler et al., 2020; Landi et al., 2021). To meet the current trends in measuring psychological flexibility, the MPFI was implemented in the design of the second study.

Another explanation of the lack of mediation effects of the core ACT processes may be connected with the positivity bias in older adults (Reed et al., 2014; Kennedy et al., 2004; Whatley et al., 2022). The content of the intervention programme and the very fact of participating in a meaningful situation could focus participants' attention on achieving goals despite limited resources. The emotional goals are prioritised in later life due to the shortened life perspective (Carstensen et al., 2003), therefore older adults tend to emphasise positive information and they remember it better (Mather & Knight, 2005). Moreover, the positive-oriented attitude, which could have been evoked by participation in the intervention, could foster achievement of short-term emotional goals, consequently leading to improving emotional well-being (Whatley et al., 2022).

As the gains in the domain of increasing quality of life and reducing psychopathology after participation in ACT-based training have not been explained by the processes of change characteristic to the ACT model, it can be hypothesised that some other nonspecific factors could have fostered these gains. One of such factors could be interaction with other people, which was connected with taking part in the training in person. As older adults are faced with numerous losses of loved ones, friends and other relations, their sense of loneliness could have been reduced by the engagement in the training programme. Thus the level of loneliness will be measured in the following study.

Another issue exploited in the research was the impact of cognitive functioning of older adults assessed herein by Mini Mental State Examination on the effectiveness of the intervention. It was hypothesised that the level of cognitive functioning will moderate the change of psychopathological symptoms and quality of life between measurements (Hypothesis 6) as people with lower levels of cognitive functioning may have lower gains in intervention outcomes as not having enough of cognitive resources that could be invested in cognitive effort during the training. The results of the moderation analysis presented in the previous chapter did not confirm Hypothesis 6. The cognitive functioning was not a moderator of the relationship between the first and second measurement of psychopathological symptoms, and quality of life. This is congruent with the literature review, which shows that the apparent deterioration of cognitive skills in late adulthood may influence everyday functioning, mood and wellbeing of older individuals (Whatley et al., 2022; Logie, Horne, Pettit, 2015). However, the neuroscientific research shows, the process of neuroplasticity, present also in late adulthood (Kossut, 2018; Sędek, Hess & Touron, 2022) can enhance the effect of adequate training on behaviour plasticity and quality of life (e.g. Cozolino, 2017; Hof & Mobbs, 2010). Additionally incorporating mindfulness skills into the intervention may be a form of cognitive training (Verhaeghen, 2022; Zanesco et al., 2019)

and train both selective and sustained attention (Hasenkamp et al., 2012). Thus, one of the explanations of the result may be the assumption that older adults with lower cognitive functioning at baseline may have also trained their cognitive abilities during the intervention. However, it is important to remember that MMSE is not a fully reliable tool of assessing cognitive functioning. Even though almost a half of participants (48.3%) had MMSE results lower than 28, it is important to remember that 41.7% of them had only primary education. Older participants related that they had discontinued their education not due to a lack of talent or will, but because of financial hardship suffered by their families in rural areas after the war. Consequently, MMSE results below or equal to 27 may not indicate cognitive impairment processes when we control for age cohort and education. However, the results of the analyses may lead to conclusion that ACT-based training may be effective regardless of the participants' level of cognitive functioning.

The effects of the intervention in the form of lowering the psychopathological symptoms and increasing quality of life were not maintained in the follow-up after 6 months. This may have been due to the length of the training programme, which, despite being engaging (2-3 times a week), lasted only for 4 weeks. The English National Institute for Health and Care Excellence (NICE, 2009) recommends mild forms of therapy should last for 12-16 weeks. It is therefore recommended for the results to be replicated in further research among older adults, which will involve longer duration of therapeutic intervention, in order to achieve lasting improvement of participants' mental health and quality of life. Additionally, it is worth noticing that despite lowering of the quality of life in the follow-up after six months, as compared to the second measurement, the participants of the experimental group reported higher levels of quality of life in the follow-up than members of the control group.

Another explanation of vanishing of positive intervention outcomes might be the pandemic circumstances during the research. Older adults were becoming more and more

tired of social distancing, isolation and were stressed and anxious due to the prolonged pressure of avoiding the infection (McCracken et al., 2021; Dziedzic et al., 2022).

The evidence from research concerning maintaining the outcomes of interventions in follow ups is mixed: in some of the studies the gains maintain (Thorsell et al., 2011; Witlox et al., 2021; Rasanen et al., 2016; Öst, 2014), whereas in other studies the intervention gains were not maintained at follow up (e.g. Majumdar & Morris, 2018).

Weaknesses and limitations of current research. The limitations of the instruments used to measure core ACT processes, specifically psychological flexibility, were outlined above. In the following study Multidimensional Psychological Flexibility Inventory (MPFI, Rolffs et al., 2016) will be introduced, which additionally will allow for measuring a larger array of ACT specific processes.

The current study investigated a small sample size. The following study will include a larger number of participants.

Another limitation of the current research was the duration of intervention (1 month). The English National Institute for Health and Care Excellence (NICE 2009) recommends mild forms of therapy should last for 12-16 weeks. It is recommended for the results to be replicated in further research of older adults, which will involve longer duration of training intervention, in order to achieve lasting improvement of participants' wellbeing and lowering of psychopathological symptomatology.

Although a great deal of research on the effectiveness of ACT incorporated inactive control conditions (Davison et al., 2017; Kyllönen, et al., 2018; Ritzert et al., 2016, Fledderus et al., 2012), it is recommended to include an active control group in RCTs (Campbell & Stanley, 2015). The inclusion of active controls in RCTs strengthens the evidence base of ACT, and increases control for nonspecific therapeutic factors. The active control groups were incorporated in a great deal of RCTs assessing the effectiveness of ACT as compared to

other therapies or interventions (e.g. Witlox et al., 2021; Forman et al., 2007; Hesser et al., 2012). In the following study the active control group will take part in the PPI because this intervention is also congruent with MSMH by developing resources for adaptation. PPIs are also evidence-based treatment whose effectiveness was confirmed in fostering well-being (e.g. Bolier, Haverman, & Westerhof, 2013; Carr et al., 2021).

Possible implications and future research. This was the first cluster RCT to evaluate an ACT intervention in later life in Poland, and the results therefore strongly contribute to the evidence-based intervention programmes (Stenhoff et al., 2022; Davison, 2017; Witlox, 2021).

The results of the current research may be clinically applicable. ACT-based programmes can be conducted for older adults at risk of social exclusion or suffering from psychopathological symptoms. As the effects of the training did not last until the follow-up, it may be recommended that the participants should either revise the program on a regular basis or incorporate the exercises into the daily routine.

Some of the results of the current study were published in the article in "Neuropsychiatry and Neuropsychology" (Chojak, 2021).

Additionally, the most recent systematic review of the literature concerning the therapeutic effects of ACT on anxiety in older adults (Delhom, Mateu-Mollá, & Lacomba-Trejo, 2022) reported seven studies up to date, including the current study. Due to the limited number of the high quality studies available, the authors of the review suggest further quality research in this domain. In the following study the Author addresses the quality issues accordingly. The outcome of the first study was the foundation, incentive and inspiration to continue the research.

6. STUDY 2

The aim of the current study was evaluating the effectiveness of ACT-based intervention among older adults in Poland. The limitations and weaknesses of the previous research were addressed in order to fulfil the requirements for RCTs, as featured in CONSORT Statement, which is an evidence-based, minimum set of recommendations for reporting randomised trials (Moher et al., 2012). The current study was carefully designed, conducted and transparently reported in order to facilitate its critical appraisal, interpretation and replication.

In brief, the differences between the design of the first and the second study are as follows:

- the tools assessing psychological flexibility and experiential avoidance (AAQ 2 and BEAQ) were substituted by MPFI,
- the inactive control condition was replaced by active control group,
- the level of cognitive functioning was measured in first study and the level of loneliness was assessed in the second study,
- the length of the training was extended from 4 to 12 weeks,
- the sample size was increased from 60 (30 participants per group) to 100 participants (50 participants per group).

The effectiveness of the intervention was operationalized as increasing the level of quality of life and/or lowering the level of psychopathological symptoms (depression/ anxiety/ psychological stress) after participating in the ACT-based original intervention.

6.1. **Hypotheses**

Hypothesis 1: The ACT-based training will be effective in increasing the quality of life.

Hypothesis 2: The ACT-based training will be effective in the reduction of the psychopathological symptoms.

Apart from the main hypotheses in the research the current study investigated the following hypotheses:

Hypothesis 3: The level of psychological flexibility, acceptance, defusion, values and contact with the present moment will change significantly between measurements only in the experimental group.

Hypothesis 4: The change in the experiential avoidance will mediate the lowering of the psychopathological symptoms and/or the increase of the quality of life.

Hypothesis 5: The change in psychological flexibility and its selected components (mindfulness, acceptance, values, defusion) will mediate the lowering of the psychopathological symptoms and/or the increasing of the quality of life.

Hypothesis 6: The level of subjective loneliness will moderate the relationship between the researched group and the difference in level of the quality of life and/or the level of psychopathological symptoms between measurements.

6.2. **Participants**

Volunteers were recruited in June 2021 from the daily care homes for older people in small towns (less than 30 thousand dwellers) in Poland. The research lasted from August to November 2021. Inclusion criteria consisted of the age over 60 years and not attending the psychotherapy sessions during the previous year.

Five volunteers were excluded because of not fulfilling the inclusion criteria. One person resigned from the participation. Written informed consent was obtained from each participant. The participants fulfilled the demographics questionnaire. The participants were 60-95 years old (M = 75.6, SD = 7.61). The majority of participants were women (80%). From primary and occupational education 72% of researched people graduated. The vast majority of them (80%) were dwellers of villages and small towns with less than 10 thousand dwellers; 20 percent of researched people lived in small towns with 10-30 thousand dwellers. Almost all of the participants were retired (99%).

6.3. **Procedure**

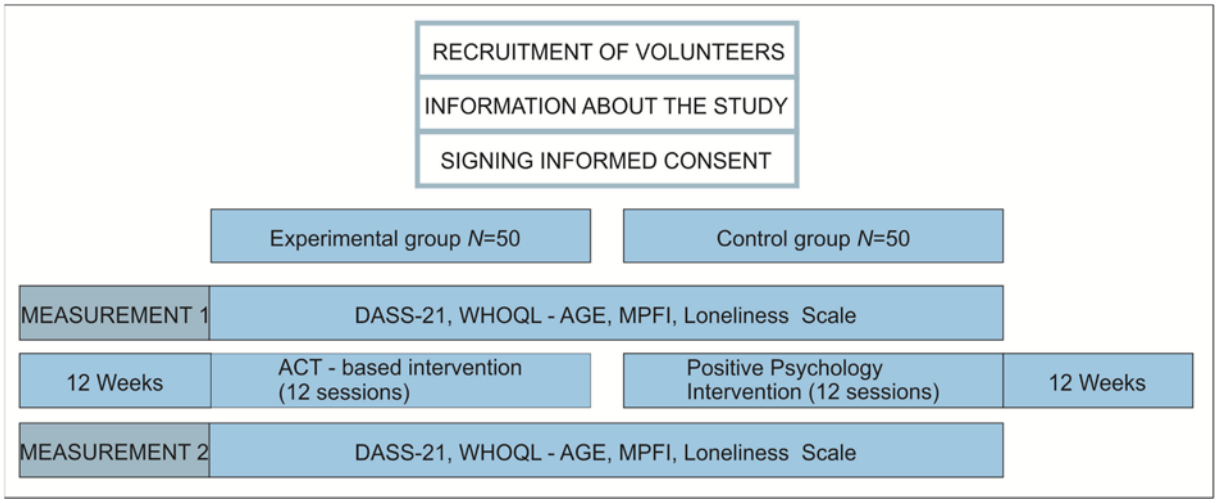
Groups of volunteers from different houses of daily care for older adults were randomly assigned to either experimental (*N*= 50) or control group (*N*= 50) with the use of an online-generated random sequence of numbers (random.org). The participants of both groups were given schedules of sessions (12 weeks, 1 session per week). All participants filled in the baseline measurement questionnaires in person. The training sessions in both groups were held in group format (10-15 people) and conducted by psychologists or therapists. The post-training measurement took place straight after the completion of the training programmes – at about 12 weeks after the baseline questionnaire assessment. All participants received the books with the intervention protocol (with the “Arte Vitae” programme accompanied by the recordings available at the webpage www.artevitae.pl) for their personal use after having

completed the second measurement. The data from the questionnaires of persons above 90 years old was excluded from the statistical analyses, due to the high probability of advanced deterioration in cognitive functioning in the Oldest Old (Johansson, Zarit,, & Berg, 1992; Legdeur et al., 2021; Legdeur et al., 2018).

Figure 11 presents the procedure and Figure 12 depicts the flow diagram of the current study.

Figure 11

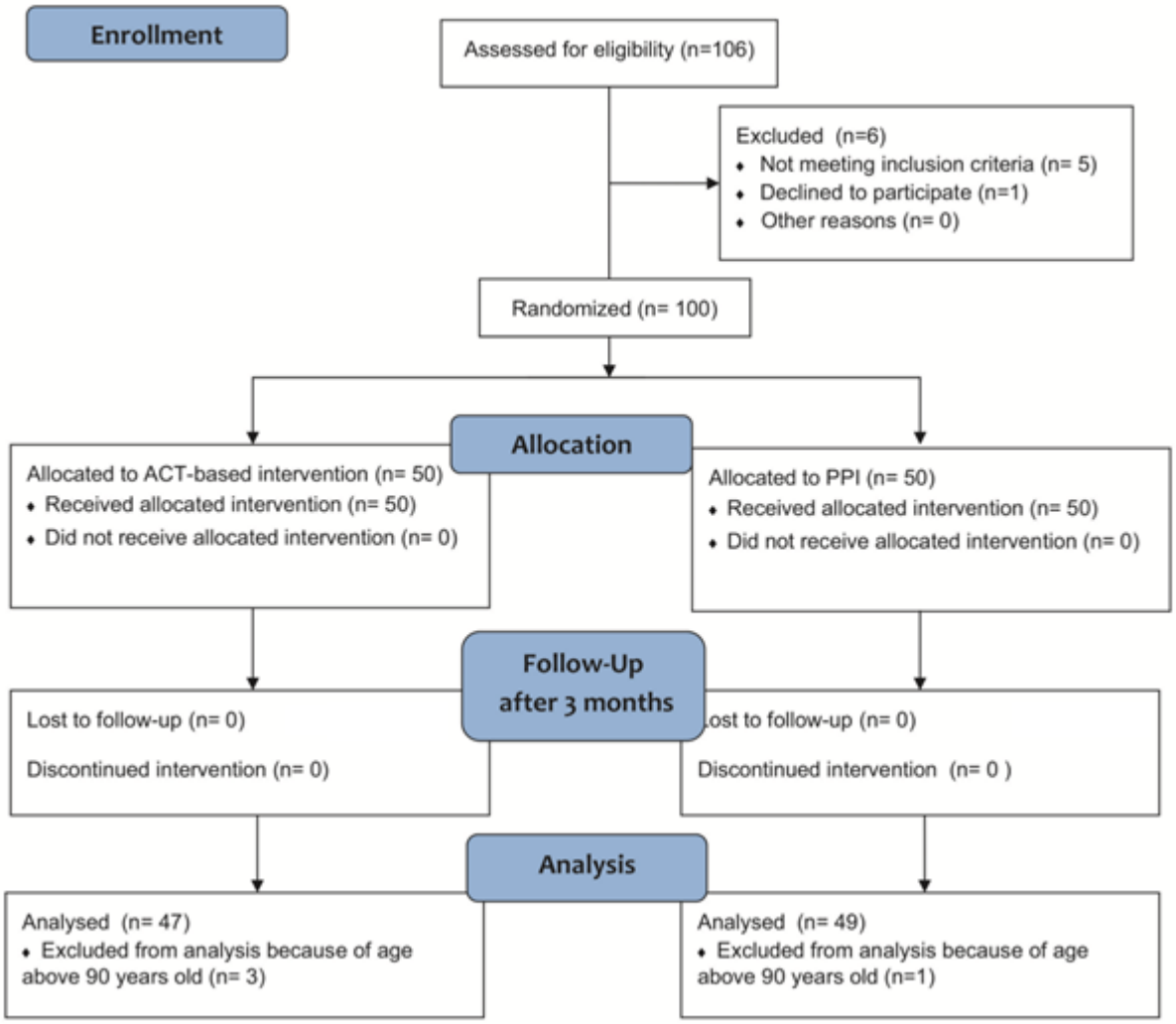
The Procedure of Study 2



Note. DASS-21 - Depression Anxiety & Stress Scale; WHOQL-AGE - World Health Organization Quality Of Life –AGE scale; MPFI-Multidimensional Psychological Flexibility Inventory

Figure 12

Flowchart of Study 2 Participants



6.4. **Measures**

The primary outcome measures were symptoms of depression, anxiety and psychological stress as measured with the shortened version of Depression Anxiety & Stress Scales (DASS-21; Lovibond & Lovibond, 1995) and the level of quality of life as measured with World Health Organisation Quality Of Life –AGE (WHOQOL - AGE; Zawisza et al. 2016).

Multidimensional Psychological Flexibility Inventory, short version, (MPFI, Rolffs et al., 2016) was administered to assess process measures comprising psychological flexibility and its constituent six core processes (acceptance, present moment awareness, self-as-context, defusion, values, committed action) and psychological inflexibility. The use of the full 60-item version could have been too demanding for older people. The shortened tool consists of 24 Likert-type questions referring to the past two weeks of respondents' life with answers from 1 "never true" to 6 "always true." The average scores represent the respective sub-processes of PF or its global score – the higher scores, the greater PF. The same scoring concerned the psychological inflexibility and its sub-processes (experiential avoidance, lack of contact with the present moment, self as content, fusion, lack of contact with values, inaction). The MPFI has demonstrated good reliability and validity in clinical and nonclinical samples across countries and cultures (Landi et al., 2021; Rolffs, Rogge, & Wilson, 2018; Gregoire et al., 2020; Seidler et al., 2020; Lin, Rogge, & Swanson, 2020). The original tool validation confirmed its high psychometric values. Associations between the MPFI subscales and a broad range of existing measures supported its convergent and discriminant validities.

In the current study the Polish experimental adaptation of MPFI was used (translated by Wieteska, K., Kleszcz, B., & Czupała, H., 2020).

11-item De Jong Gierveld Loneliness Scale (De Jong-Gierveld & Kamphuls, 1985) was administered in order to evaluate the level of loneliness due to the social isolation connected with COVID-19 pandemics. The tool was designed to assess a generalised feeling of loneliness rather than to measure the severity of feelings of loneliness. The instrument in Spanish version in the sample of older adults demonstrated good reliability at the level of 0,91 (Buz, Urchaga, & Polo, 2014) so the tool can be used among older populations. Initially the authors proposed that the tool separates out different types of loneliness: social and emotional,

however some authors report that factor analysis techniques revealed that the scale was essentially unidimensional (Buz, Urchaga, & Polo, 2014).

Polish adaptation by Grygiel et al. (2013) was used in the current study. The Polish adaptation demonstrates good levels of reliability (α = 0.89), internal consistency, homogeneity (H = 0.47), and construct validity. Polish validations showed that the instrument measures two dimensions of loneliness (social and emotional) which generalise into a higher-order factor of a general sense of loneliness Grygiel (Grygiel et al., 2013). Emotional loneliness is measured with negatively worded items e.g. "Often I feel rejected," "I experience a general sense of emptiness," whereas positively worded items such as "There are enough people I feel close to," "There are many people I can trust completely" assess social loneliness.

6.5. Training programmes

ACT-based intervention *Arte Vitae*. The intervention programme was the same as in the first study and was administered in the experimental group in the current study.

Positive Psychology Intervention (PPI). Control group training was an own elaboration of the Author of this dissertation based on the premises of Positive Psychology, specifically on the intervention aiming at increasing happiness (Seligman, 2002b, after: Trzebińska, 2008; Mongrain & Anselmo-Matthews, 2012). The original programme (Seligman et al., 2005) consisted of five exercises which were to be completed within one week and focused on practising gratitude, building awareness of what is the most positive about oneself and on identifying strengths of the character. The intervention premises were convergent with the Positive Ageing approach by fostering positive emotions, cognitions and behaviours among older adults.

The participants of the research (Seligman et al., 2005) were assigned to experimental conditions practising one of the exercises for a week, whereas participants in the control condition were asked to write about their early memories every night for one week. The description of the exercises in the experimental condition is presented below (Seligman et al., 2005).

Gratitude visit. This exercise consisted of writing and delivering in person a letter of gratitude to someone who had been particularly kind to the participant but had never been properly thanked.

Three good things in life. This exercise comprised writing down by a participant three things that went well and their reasons each day for a week.

You at your best. This task consisted of writing about a time when a person was at his or her best and then reflecting on the personal strengths displayed in those situations.

Using signature strengths in a new way. This task comprised two parts. First part consisted of fulfilling an inventory of character strengths online at www.authentichappiness.org and receiving individualised feedback about top five ("signature") strengths (Peterson et al., 2005). The second part comprised using one of these top strengths in a new and different way every day for one week.

Identifying signature strengths. This exercise was a modified version of the previous exercise. It consisted of taking the same survey, noting the individual's five highest strengths, and using them more often during the next week.

The results of the study were compelling: participants in both experimental and control groups tended to be happier and less depressed at the immediate posttest. However, the effect remained stable in post tests after a week and during a half a year period only in the experimental conditions. The participants in the gratitude visit condition showed the largest boost in happiness and decrease in depressive symptoms in the whole study. The authors

hypothesised that the remaining effects in follow ups are connected with adherence to the study exercises - persons continued to practise exercises on a regular basis.

The five exercises in more detailed form (for example instead of writing a letter of gratitude “to someone”, it was specified “to a friend” or “to someone from family” etc.) were introduced into the intervention protocol in this study. They were also repeated in the subsequent sessions in slightly altered form so as the whole intervention consisted of the same amount of sessions as the experimental group’s training. Each session was accompanied by a relaxation exercise (Schultz Autogenic Training). The contents of the intervention are presented in Table 12.

Table 12

Training Protocol for the Control Group

Session	Exercises	Original exercise (Seligman et al., 2005)
1	Writing a gratitude letter to a friend. Reading the letters (for volunteers). Relaxation. Homework: delivering the letter to a friend.	Gratitude visit.
2	Writing another gratitude letter to a family member. Reading the letters (for volunteers). Homework: writing a gratitude letter to someone else who had not been thanked properly & delivering the letters. Relaxation.	Gratitude visit.
3	Giving feedback on writing letters and giving them to the addressees. “Three good things” exercise (participants write down three things that went well the previous day and their causes. Volunteers read aloud the notes. Homework: writing down three good things of the day every evening of the following week and providing a causal explanation for each good thing. Relaxation.	Three good things in life.
4	Reporting back (each participant) on the things that went well the previous week. Relaxation.	Three good things in life.
5	Giving the definition of the character strength (in small groups) and naming the character strengths. Reading the list of character strengths and their characteristics. Homework: thinking which character strengths characterise each participant -writing down one each evening. Relaxation.	Identifying signature strengths.
6	Writing about a time when participants were at their best and then to reflect on the personal strengths displayed in the story. Relaxation. Homework: reviewing their story once every day for a week and reflecting on the identified strengths.	You at your best.
7	Giving feedback on the group forum on the best time in life. Taking out the short version inventory of character strengths. Relaxation.	You at your best.

Session	Exercises	Original exercise (Seligman et al., 2005)
8	Analysing the inventory of character strengths and defining one's 5 top „signature strengths" (in small groups). Relaxation. Homework: writing down past situations when participants used their top strengths.	Identifying signature strengths.
9	Giving feedback on using top strengths in the past. Relaxation. Homework: using 5 top strengths in a new and different way every day for the following week and writing down these ways and one's impressions.	Using signature strengths in a new way.
10	Giving feedback on using top strengths the previous week. Relaxation. Homework: using the top strengths as often as possible during the following week.	Identifying signature strengths.
11	Giving feedback on using top strengths the previous week. Writing down top strengths and thinking of new ways of using them in the following week. Relaxation. Homework: implementing top 5 strengths into everyday life in the following week. Writing down the successes every evening.	Identifying signature strengths/using signature strengths in a new way.
12	Giving feedback on using the top strengths in the previous week. Writing down the possible positive outcomes of the participation in the programme and sharing with other participants. Relaxation.	Using signature strengths in a new way.

The aforementioned training programmes are expected to be effective through distinctive processes of change. ACT core processes connected with psychological flexibility and its components have been supported by a considerable body of research as mediators of change (Levin et al., 2012; Stockton et al., 2019; Pots et al., 2016). The processes that could act as processes of change in PPI are connected with components of the PERMA model (Seligman, 2011): Positive Emotion, Engagement, Relationships, Meaning and Accomplishment, present also in positive aging approach.The participation in the study may boost well-being through a common factor involving the activation of positive, self-relevant information.

6.6. **Statistical analyses**

The statistical analyses were performed with the use of IBM SPSS Statistics 27.0 programme. Out of 100 participants, the data from 96 participants was included in an

analysis: 47 participants from the experimental group aged 65-86 (M =76.34, SD = 6.08) and 49 participants from the control group aged 60-90 (M = 73.49, SD=7.37). The data collected from the persons above 90 years old was excluded from analyses. The collected data is openly available: Chojak, Agnieszka (2022), "ACT-based intervention among older adults in Poland _ study 2_2021", Mendeley Data, V1, doi: 10.17632/6d9tyw3tyf.1 (https://data.mendeley.com/datasets/6d9tyw3tyf/1).

According to the Student's t test for independent samples the difference regarding participants' age was statistically significant, $t(94)=-2.06$, $p < .05$. The participants in the experimental group were significantly older. Therefore, the analyses were performed with controlling for participants' age.

Differences between consecutive measurements in two groups were analysed with repeated measures ANOVA with participants' age included as a covariate. Statistically significant interaction effects were analysed further with pairwise comparisons based on Bonferroni correction. Mediation effects analysis was based on Hayes' macro Process (2018) in model 4. Values of mediators and explained variables acquired in the second measurement were included in the analysis as the main variables.

The main hypotheses of this study were tested with evaluating the differences in the level of psychopathological symptoms and quality of life for the initial and the final measurement, and between the experimental and the control group with 2x2 repeated measures analysis of variance ANOVA (2 groups x 2 measurements). For the purpose of the analyses the significance level $\alpha = .05$ was assumed. Training was the inter-object factor, whereas the intra-group factor was the measurements of the quality of life and psychopathological symptoms at baseline and after 3 months. The analyses were conducted for the results of WHOQOL – AGE and for the depression, anxiety and psychological stress subscales of DASS-21. In the next step the mediation models were tested in order to indicate

if any of the following variables: psychological flexibility, psychological inflexibility, mindfulness (contact with the present moment), acceptance, defusion or values constituted the mechanism of change in the outcome variables. Mediation effects analysis was based on Hayes' macro Process (2018) in model 4. Values of mediators and explained variables acquired in the second measurement were included in the analysis as the main variables. The values from the first measurement were analysed as controlled variables. Therefore, the relationships detected can be interpreted as relationships between changes, i.e. the group membership is related to changes in mediator values, which as a consequence lead to changes in the values of explained variables.

Finally, the moderation models were tested to verify the hypotheses concerning the moderating role of loneliness in change between the baseline and post-intervention measurements of the psychopathological symptoms and the quality of life.

6.7. **Results**

In the first step the descriptive statistics were calculated together with Shapiro-Wilk tests of normality. The analyses were held separately for the control and experimental group and the results are presented in Tables 13 and 14. In the control group there were no statistically significant deviations of the following variables from the normal distribution: quality of life in first measurement, psychological flexibility in second measurement and acceptance in first measurement. In the experimental group there were no statistically significant deviations of the following variables from the normal distribution: quality of life in both measurements, depressive symptoms in first measurement, psychological flexibility in second measurement, acceptance in first measurement, and defusion in second measurement. The distribution of the remaining variables slightly diverged from normal. Nevertheless, the absolute value of

skewness for those variables was not higher than 2, i.e. the divergence from normal distribution was not significant (George & Mallery, 2016).

Table 13

Descriptive Statistics with Tests of Normality in the Control Group

	M	*Me*	*SD*	*Sc.*	*Curt.*	*Min.*	*Max.*	*W*	*p*
Quality of life - measurement 1	45.98	47.00	5.86	-.25	-.22	34	60	.97	.171
Quality of life - measurement 2	45.14	46.00	6.13	-.76	.65	28	58	.95	.026
Depressive symptoms – measurement 1	7.12	4.00	6.19	.73	-.93	0	19	.85	.001
Depressive symptoms – measurement 2	4.56	3.50	4.12	.82	-.35	0	15	.89	.001
Stress symptoms-measurement 1	7.00	5.00	5.15	.47	-1.32	1	16	.87	.001
Stress symptoms-measurement 2	5.02	4.00	4.07	.77	-.28	0	16	.91	.001
Anxiety symptoms- measurement 1	5.90	5.00	4.76	.65	-.08	0	20	.92	.003
Anxiety symptoms- measurement 2	4.64	4.00	3.81	.73	-.17	0	14	.92	.003
Symptoms total - measurement 1	20.02	16.00	15.12	.52	-1.13	1	52	.90	.001
Symptoms total - measurement 2	14.20	11.00	10.67	.73	-.43	0	38	.92	.002
Psychological flexibility – measurement 1	39.30	37.50	9.45	1.25	1.28	26	66	.89	.001
Psychological flexibility – measurement 2	37.60	36.50	6.92	.44	.21	23	55	.98	.493
Acceptance – measurement 1	14.06	15.00	4.74	-.09	-.42	5	24	.97	.276
Acceptance – measurement 2	12.90	12.50	4.74	.97	3.10	5	31	.94	.009
Defusion – measurement 1	15.66	13.00	5.97	1.17	.64	7	30	.85	.001
Defusion – measurement 2	14.44	14.50	3.52	.35	-.65	8	22	.94	.021
Present Moment – measurement 1	5.18	5.00	2.58	.95	.88	2	12	.90	.001
Present Moment – measurement 2	4.74	5.00	1.63	-.21	-.62	2	8	.93	.005

Table 14

Descriptive Statistics with Tests of Normality in the Experimental Group

	M	*Me*	*SD*	*Sc*	*Cur.*	*Min*	*Max*	*W*	*p*
Quality of life - measurement 1	43.22	42.00	9.07	0.11	-.72	25	65	.97	.193
Quality of life - measurement 2	45.40	44.50	10.05	-.05	-.78	21	65	.96	.131
Depressive symptoms – measurement 1	6.00	5.00	3.85	.43	-.16	0	17	.96	.071
Depressive symptoms – measurement 2	4.16	3.00	3.64	.70	-.76	0	12	.89	.001
Stress symptoms-measurement 1	6.82	7.00	4.49	.78	-.24	0	17	.91	.001
Stress symptoms-measurement 2	4.78	4.00	3.70	.94	-.14	0	14	.88	.001
Anxiety symptoms- measurement 1	6.32	5.00	5.22	.25	-1.26	0	17	.91	.001
Anxiety symptoms- measurement 2	5.20	4.00	4,.32	.45	-1.05	0	15	.91	.001
Symptoms total - measurement 1	19.14	20.00	11.62	.11	-1.27	2	39	.93	.006
Symptoms total - measurement 2	14.14	11.50	9.40	.63	-.71	1	35	.92	.003
Psychological flexibility – measurement 1	42.66	41.50	8.23	.45	-.83	32	60	.92	.002
Psychological flexibility – measurement 2	48.74	48.50	5.76	-.05	-.89	36	61	.96	.133
Acceptance – measurement 1	15.14	15.00	4.74	-.21	-.45	5	25	.98	.593
Acceptance – measurement 2	18.70	19.50	4.21	-.88	.84	5	25	.94	.011
Defusion – measurement 1	16.68	17.50	4.25	-.26	-1.24	10	23	.90	.001
Defusion – measurement 2	18.62	19.00	4.25	-.23	.26	6	26	.96	.088
Present Moment – measurement 1	5.70	6.00	2.20	.10	-.61	2	11	.93	.004
Present Moment – measurement 2	6.86	7.00	1.95	.10	-.90	4	10	.91	.001

In the next stage of data analysis statistical significance of changes between two consecutive measurements was verified with the use of mixed models repeated measures analysis of covariance. Table 15 presents estimated marginal means for analysed variables in

both measurements while controlling for participants' age and values of statistical tests for within-group effects, between-group effects and within-between interactions.

Table 15

Estimated Marginal Means Analysed Variables in Both Measurements While Controlling for Participants' Age

Variables	Measurement	Group	M	SE		*F*	df	*p*	η^2
Quality of life	I	control	45.63	1.11	within-group	.08	1,93	.782	.001
		experimental	44.80	1.21	between-group	.08	1,93	.774	.001
		Total	44.60	.78	within x between	17.15	1,93	.001	.156
	II	control	43.58	1.13					
		experimental	45.91	1.23					
		Total	45.36	.85					
Depression	I	control	7.12	.76	within-group	.01	1,93	.951	.001
		experimental	4.48	.57	between-group	.46	1,93	.498	.005
		Total	6.64	.53	within x between	.83	1,93	.364	.009
	II	control	6.15	.77					
		experimental	4.27	.58					
		Total	4.37	.40					
Psychological stress	I	control	7.10	.71	within-group	.40	1,93	.530	.004
		experimental	5.11	.57	between-group	.02	1,93	.878	.001
		Total	7.06	.50	within x between	.03	1,93	.864	.001
	II	control	7.03	.72					
		experimental	4.91	.58					
		Total	5.01	.40					

Variables	Measurement	Group	M	SE		*F*	df	*p*	η^2
Anxiety	I	control	5.90	.72	within-group	.17	1,93	.684	.002
		experimental	4.57	.60	between-group	.66	1,93	.417	.007
		Total	6.26	.51	within x between	.03	1,93	.874	.001
	II	control	6.61	.74					
		experimental	5.36	.61					
		Total	4.97	.42					
Symptoms total	I	control	20.12	1.97	within-group	.03	1,93	.876	.001
		experimental	14.13	1.47	between-group	.01	1,93	.987	.001
		Total	19.96	1.39	within x between	.17	1,93	.680	.002
	II	control	19.79	2.01					
		experimental	14.55	1.50					
		Total	14.34	1.04					
Psychological flexibility	I	control	39.48	1.29	within-group	.59	1,93	.445	.006
		experimental	37.56	.93	between-group	32.69	1,93	.001	.260
		Total	41.29	.91	within x between	18.77	1,93	.001	.168
	II	control	43.10	1.32					
		experimental	49.19	.95					
		Total	43.37	.65					

Variables	Measurement	Group	M	SE		*F*	df	*p*	η^2
Acceptance	I	control	14.20	.69	within-group	.03	1,93	.856	.001
		experimental	13.03	.66	between-group	14.73	1,93	.001	.137
		Total	14.70	.49	within x between	25.68	1,93	.001	.216
	II	control	15.20	.71					
		experimental	18.67	.67					
		Total	15.85	.47					
Defusion	I	control	15.67	.77	within-group	.39	1,93	.536	.004
		experimental	14.44	.57	between-group	9.93	1,93	.002	.096
		Total	16.25	.54	within x between	14.52	1,93	.001	.135
	II	control	16.83	.78					
		experimental	18.82	.58					
		Total	16.63	.40					
Present moment	I	control	5.25	.35	within-group	1.74	1,93	.190	.018
		experimental	4.74	.25	between-group	13.40	1,93	.001	.126
		Total	5.51	.25	within x between	11.66	1,93	.001	.111
	II	control	5.77	.36					

Variables	Measurement	Group	M	SE		*F*	df	*p*	η^2
Values	I	experimental	6.91	.26					
		control	7.95	0.30	within-group	.01	1,93	.917	.01
		experimental	8.07	0.31	between-group	.48	1,93	.490	.01
		Total	8.01	0.21	within x between	3.38	1,93	.069	.04
	II	control	9.13	0.23					
		experimental	8.54	0.24					

Note. M – mean value; *SE* – standard error; *F* – value of analysis of variance effect test; *df* – degrees of freedom; *p* – statistical significance; η^2 – eta-squared effect size measure

6.7.1. **Testing of hypothesis 1**

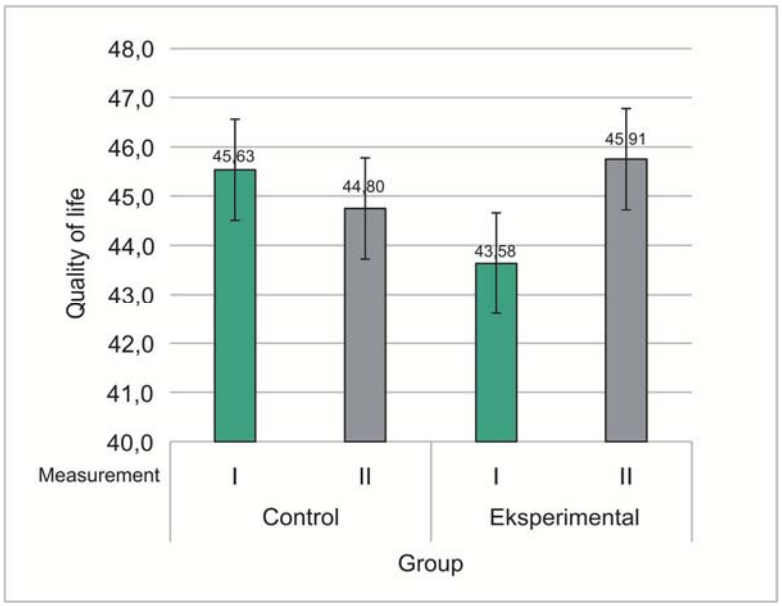
Hypothesis 1: The ACT-based training will be effective in increasing the quality of life.

Quality of life. The main effect for measurement was statistically insignificant, $F(1, 93)=.08$, $p=.782$, $\eta^2= .001$. The main effect for the training, the inter-object factor, was statistically insignificant too, $F(1, 93)= .08$, $p=.774$, $\eta^2= .001$. The interaction of both factors was significant, $F(1, 93)= 17.15$, $p=.001$, $\eta^2= .156$.

*P*airwise comparisons based on Bonferroni correction revealed that only in the experimental group the quality of life in the second measurement was significantly higher than in the first measurement (see Figure 13), $F(1, 93) =18.73$, $p < .001$, $\eta^2= .17$. In the control group there was no statistically significant difference between the two consecutive measurements, $F(1, 93) =2.45$, $p>.05$.

Figure 13

Estimated Marginal Means of Quality of Life in Two Consecutive Measurements



The results of the analysis confirmed hypothesis 1 that ACT-based training would be effective in increasing the quality of life only in the experimental group.

6.7.2. **Testing of hypothesis 2**

Hypothesis 2: The ACT-based training will be effective in the reduction of the psychopathological symptoms.

The global mean level of depression in baseline measurement was at the level of 6.64 (SD=5.2) which according to DASS norms was at a "mild" level of depression.

The mean level of anxiety symptoms in the baseline measurement equalled 6.26 (SD = 4.97) referred to as „moderate anxiety". The mean level of psychological stress at level 7.06 (SD = 4.84) indicated „normal level" according to DASS description of severity of symptoms. The degree of severity of symptoms in the baseline measurement according to cut-off scores for defining the severity of symptoms measured by DASS are presented in Table 16.

Table 16

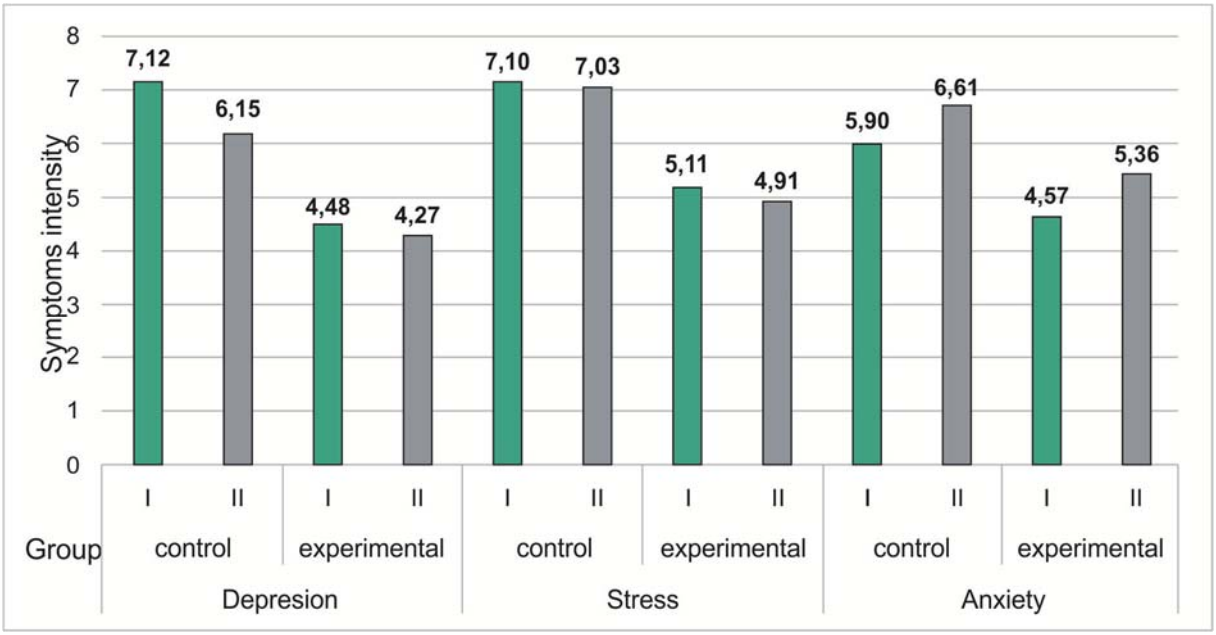
The Severity and Distribution of Psychopathological Symptoms in Baseline Measurement

Level of severity of symptoms	Frequency (%)				
	Normal	Mild	Moderate	Severe	Extremely severe
Anxiety	37.5	13.5	8.4	8.3	32.3
Depression	45.8	12.5	21.9	7.3	12.5
Stress	58.3	11.5	9.4	19.8	1

Figure 14 presents the changes in symptoms between baseline and second measurements.

Figure 14

The Changes in Symptoms Between Measurements in Both Training Groups



Symptoms of depression. The main effect for measurement was statistically insignificant, $F(1, 93) = .01$, $p = .951$, $\eta^2 = .001$. The main effect for training, the inter-object factor, was also insignificant, $F(1, 93) = .46$, $p = .498$, $\eta^2 = .005$. The interaction of both factors was insignificant too, $F(1, 93) = .83$, $p = .364$, $\eta^2 = = .009$.

Symptoms of anxiety. The main effect of symptoms of anxiety was statistically insignificant, $F(1, 93) = .17$, $p = .684$, $\eta^2 = .002$. The level of anxiety did not alter significantly between measurements. The main effect for the training was also insignificant, $F(1, 93) = .66$, $p = .417$, $\eta^2 = .007$ - the groups did not differ significantly as far as the level of symptoms of anxiety was concerned. The interaction effect was also insignificant, $F(1, 93) = .03$, $p = .874$, $\eta^2 = .001$, which means that the groups did not differ in the level of symptoms of anxiety in both measurements.

To verify if the number of participants with elevated anxiety at the level of "extremely severe" decreased in measurement 2 in both groups, McNemar test for dependent samples was applied. It was statistically significant in the experimental group, $p = .039$, and in the

control group, p =.039. This means that there was a statistically significant decrease in the number of participants with elevated anxiety level in both groups. Table 17 presents data concerning this trend.

Table 17

The Number of Participants with the Anxiety at Extremely Severe Level

	Measurement 1	Measurement 2
Experimental group	18 (38.3%)	11 (23.4%)
Control group	13 (26.5%)	6 (12.2%)
Total	31 (32.3%)	17 (17.7%)

These data do not indicate if the change occurred for the same individuals. It might have been that some of the persons with elevated levels of anxiety experienced the lowering of the symptoms, while for others with anxiety at lower levels, the symptoms skyrocketed. In order to assess the changes for the individuals with elevated levels of anxiety at the baseline, the repeated measures ANOVA was conducted. The analyses showed that the groups did not differ in the level of anxiety, $F(1, 29) = .41$, p=.523. Although the main effect for anxiety was significant, $F(1, 29) = 43.43$, $p < .001$, $\eta^2 = .60$, the interaction effect was insignificant, $F(1, 29) = 1.75$, $p = .196$ – the groups did not differ in how the level of anxiety changed between measurements. These analyses showed that the level of anxiety decreased significantly between measurements among people with elevated levels of anxiety at the baseline measurement, but there was no difference between the two groups regarding this reduction.

Symptoms of psychological stress. The level of psychological stress did not alter significantly between measurements, $F(1, 93) = .40$, $p = .53$, $\eta^2 = .004$. The groups did not differ significantly as far as the level of symptoms of psychological stress was concerned, $F(1, 93) = .02$, $p = .864$, $\eta^2 = .001$. The groups did not differ also in the level of symptoms of psychological stress in both measurements, $F(1, 93) = .03$, $p = .864$, $\eta^2 = .001$.

Statistical analyses revealed that neither ACT-based intervention nor Positive Psychology intervention decreased symptoms of psychological stress, anxiety, and depression. The Hypothesis 2 was not confirmed.

6.7.3. **Testing of hypothesis 3**

Hypothesis 3: The level of psychological flexibility, acceptance, defusion, values and contact with the present moment will change significantly between measurements only in the experimental group.

Statistically significant changes were detected for the processes of change in ACT: psychological flexibility, acceptance, defusion, values and contact with the present moment.

After the ACT-based intervention the level of psychological flexibility in the experimental group in the second measurement was significantly higher than in the first measurement, $F(1, 93)=21.71$, $p <.001$, $\eta^2=.19$. In the control group there was no statistically significant change between the two consecutive measurements, $F(1, 93) = 2.26$, $p >.05$.

The same pattern of differences was found in the levels of acceptance. The level of acceptance in the experimental group in the second measurement was significantly higher post intervention than in the first measurement, $F(1, 93) = 28.80$, $p < .001$, $\eta^2=.24$. In the control group there was no statistically significant change in the level of acceptance change between the two consecutive measurements, $F(1, 93) = 3.65$, $p >.05$.

The level of defusion increased in the experimental group. After the ACT-based intervention the level of defusion in the second measurement was significantly higher than in the first measurement, $F(1, 93) = 11.08$, $p < .01$, $\eta^2=.11$. In the control group the level of defusion in the second measurement was significantly lower than in the first measurement, $F(1, 93) = 4.44$, $p < .05$, $\eta^2 = .05$.

The level of contact with the present moment in the experimental group in the second measurement was significantly higher than in the first measurement, $F(1, 93) = 11.20$, $p<.001$, $\eta^2=.11$, while in the control group there was no statistically significant difference between the two consecutive measurements, $F(1, 93) = 2.30$, $p > .05$.

The level of values increased significantly between measurements, $F(1, 93) = 19.10$, $p <.001$, $\eta^2 = .17$. The groups did not differ significantly as far as the level of values was concerned, $F(1,93) = .69$, $p = .41$, $\eta^2 = .01$. The groups did not also differ in the level of values in both measurements, $F(1,93) = 3.18$, $p = .08$, $\eta^2 = .03$.

Hypothesis 3 stating that the level of psychological flexibility, acceptance, defusion and contact with the present moment will change significantly between measurements only in the experimental group was confirmed.

6.7.4. **Testing of hypotheses 4 and 5 with mediation analysis**

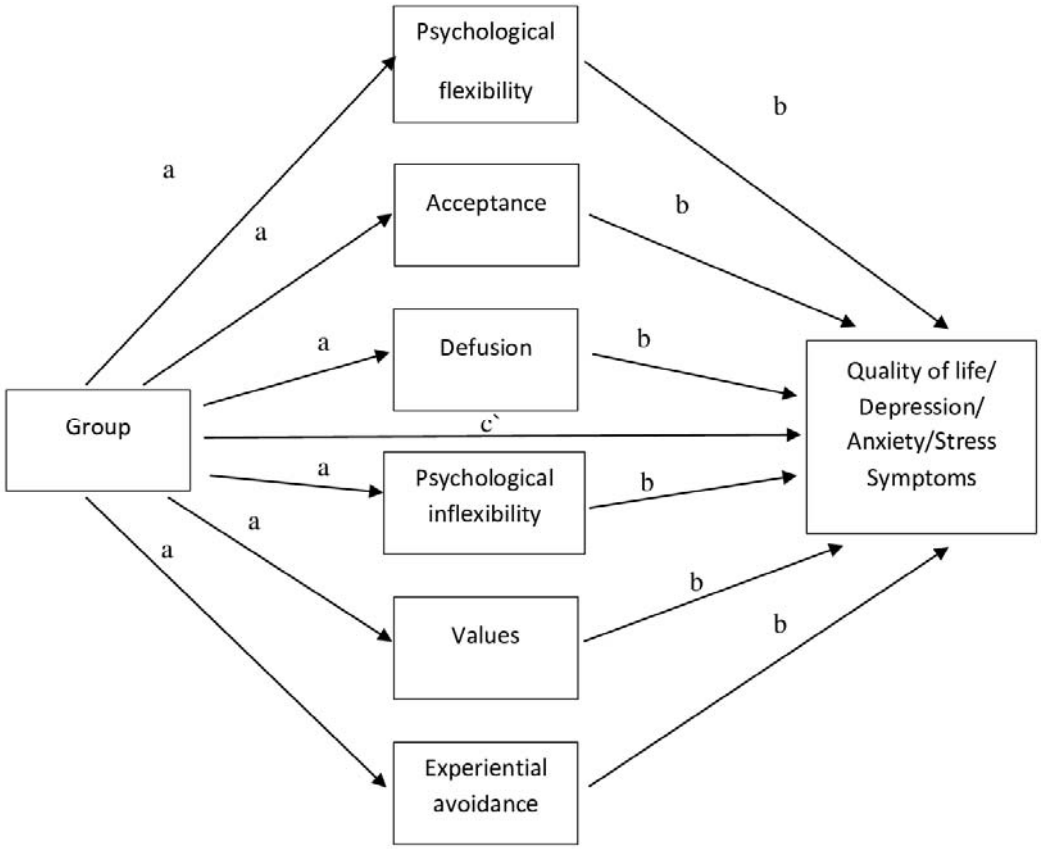
Hypothesis 4: The change in the experiential avoidance will mediate the lowering of the psychopathological symptoms and/or the increase of the quality of life.

Hypothesis 5: The change in psychological flexibility and its selected components (mindfulness, acceptance, values, defusion) will mediate the lowering of the psychopathological symptoms and/or the increasing of the quality of life.

Mediation analysis was performed with the use of Hayes macro Process (2018) in the model no. 4. The group membership (experimental vs control) was analysed as an explaining variable.Psychological flexibility, acceptance, defusion, present moment, inflexibility, values and experiential avoidance were analysed as mediators. Quality of life, intensity of depression, stress and anxiety symptoms were analysed as explained variables. Each mediator and each explained variable was analysed in a separate model. Figure 15 presents analysed relationships between analysed variables.

Figure 15

Verified Model of Relationships Between Analysed Variables



The analyses were based on the guidelines of Hayes (2018) for analysing mediation in repeated measures design. The values from the second measurement regarding each variable were included in analysis, while controlling for the values from the first measurement. Therefore, the values from the second measurement for each participant were analysed as being relative to the values from the first measurement. The use of this technique, instead of calculating differences between two consecutive and using these differences as dependent variables, enabled avoiding artefacts related to regression to the mean or measurement ceilings or floors. It was also assumed that reliability of measurement for difference of scores is lower than reliability of each measurement separately. The higher the correlation between consecutive measurements, the lower reliability of difference of scores (Lord, 1963). The

results of the analyses are depicted in Table 18. The table presents 95% confidence intervals for standardised regression coefficients acquired for paths depicted in Figure 2 with the use of the bootstrap method. Statistically significance relationships are marked with a bold font.

Table 18

Results of Mediation Analysis

Mediator	Explained var.	Effects				R^2
		a	b	c`	indirect	
Flexibility	Quality of life	**.95, .99**	**.25, .46**	-.35, .08	**.26, .65**	.870
	Depression	**.95, .99**	-.29, .14	-.27, .60	-.31, .13	.420
	Stress	**.95, .99**	**-.39, -.01**	-.15, .62	**-.45, -.05**	.550
	Anxiety	**.95, .99**	-.05, .22	-.32, .23	-.07, .26	.770
Acceptance	Quality of life	**.65, .99**	**.09, .29**	-.02, .37	**.09, .30**	.840
	Depression	**.65, .99**	-.24, .14	-.26, .51	-.26, .15	.410
	Stress	**.65, .99**	-.17, .17	-.38, .31	-.15, .18	.530
	Anxiety	**.65, .99**	-.11, .14	-.19; .29	-.12, .10	.770
Defusion	Quality of life	**.58, .99**	**.12, .35**	-.10, .32	**.10, .34**	.840
	Depression	**.58, .99**	-.28, .08	-.21, .53	-.25, .09	.420
	Stress	**.58, .99**	**-.35, -.03**	-.18, .47	**-.30, -.01**	.550
	Anxiety	**.58, .99**	-.03, .20	-.24, .21	-.04, .22	.780
Present moment	Quality of life	**.67, .99**	**.01, .22**	**.04, .46**	**.03, .21**	.820
	Depression	**.67, .99**	-.12, .26	-.39, .37	-.09, .27	.420
	Stress	**.67, .99**	-.17, .17	-.38, .31	-.15, .15	.530
	Anxiety	**.67, .99**	-.07, .17	-.22, .26	-.08, .20	.590
Inflexibility	Quality of life	-.45, .15	**-.27, -.07**	**.16, .50**	-.02, .09	.837
	Depression	-.45, .15	**.15, .46**	-.21, .39	-.14, .04	.495
	Stress	-.45, .15	**.13, .40**	-.28, .26	-.13, .03	.592
	Anxiety	-.45, .15	-.05, .15	-.13, .28	-.03, .02	.773
Values	Quality of life	**-.75, -.04**	**.01, .20**	**.22, .58**	-.09, .10	.824
	Depression	**-.75, -.04**	-.23, .11	-.29, .38	-.05, .11	.416
	Stress	**-.75, -.04**	-.26, .02	-.37, .21	-.02, .13	.540
	Anxiety	**-.75, -.04**	-.12, .08	-.15, .27	-.04, .06	.770

Mediator	Explained var.	Effects				R^2
		a	b	c`	indirect	
Experiential avoidance	Quality of life	-.27, .39	**.01, .19**	**.18, .54**	-.02, .05	.823
	Depression	-.27, .39	-.28, .03	-.25, .39	-.07, .04	.654
	Stress	-.27, .39	-.28, .01	-.32, .25	-.07, .04	.545
	Anxiety	-.27, .39	**.02, .22**	-.13, .27	-.03, .05	.784

Note. R^2– determination coefficient

The changes in values of psychological flexibility, acceptance, defusion and contact with a present moment between two consecutive measurements were significantly higher in the experimental group than in the control group. The changes in the levels of psychological flexibility, acceptance, defusion and contact with the present moment led to higher increase in quality of life. The changes in psychological flexibility, acceptance, defusion and contact with a present moment were statistically significant mediators of the relationship between group membership and increase in quality of life. The direct relationship between group membership and the change in quality of life was statistically insignificant when psychological flexibility, acceptance or defusion was included in the model, which means that psychological flexibility, acceptance and defusion were full mediators of the relationship mentioned above. However, the direct relationship was still statistically significant when contact with a present moment was included in the model, indicating that contact with the present moment was a partial mediator. Depending on the mediator the statistical models explained from 82.0% to 87.0% of the increase in quality of life.

The change in the levels of psychological flexibility and defusion also led to stronger reduction of the stress level in the experimental group. Both psychological flexibility and defusion were statistically significant mediators of the relationship between group membership and reduction of stress. The direct relationship between group membership and

stress was statistically insignificant, which means that both psychological flexibility and defusion were full mediators of the relationship mentioned above. The model of mediation based on increase of psychological flexibility explained 55.6% of the variance in stress reduction. The model of mediation based on increased defusion explained 55.0% of the variance in stress reduction.

6.7.5. **Testing of hypothesis 6 with moderation models**

In the current study moderation effects analysis was based on interaction effects. The group membership was a moderator for changes between the two consecutive measurements. In the next analysis we verified if loneliness was a moderator of the group membership effect. Therefore, we analysed moderated moderation. From technical point view, in order to verify if loneliness was a moderator of the effects analysed and presented in Table 1 Current sample was firstly divided by the level of loneliness with the use of median split (*Me* = 27.00), then additional second order interaction level of loneliness x Group x measurement was verified. The results are presented in Table 19.

Table 19

Tests for Second Order Interaction Level of Loneliness x Group x Measurement

Variables	*F*	*df*	*p*
Quality of life	1.33	1,91	.253
Depression	.17	1,91	.680
Stress	3.94	1,91	.051
Anxiety	.09	1,91	.767

Note. F – value of analysis of variance effect test for second order interaction; *df* – degrees of freedom; *p* – statistical significance

None of the second order interaction effects was statistically significant. The level of loneliness did not alter between measurements. The main effect for measurement was

statistically insignificant, $F(1, 93)= .059$, $p=.81$. The main effect for the training was also insignificant, $F(1, 93) = .161$, $p=.69$. The interaction effect was insignificant too, $F(1, 93)= 2.65$, $p=.11$. Thus, the participation in the ACT-based training or PPI did not change the level of loneliness among participants.

6.8. **Discussion**

Interpretation of findings. The aim of the current study was assessing the efficacy of an original ACT-based intervention among older adults in Poland. The effectiveness was operationalized as increasing the quality of life and/or lowering psychopathological symptoms among participants of the experimental condition. The testing of main hypotheses of the overall current research and the additional study questions specific to the current study was conducted with the performing statistical analysis of the collected data.

Quality of life. The statistical analyses confirmed the hypothesis about the effectiveness of ACT intervention in increasing quality of life. The interaction effect found in this study is in line with results from the first study of current research and a compelling body of previous studies (e.g. meta-analyses of randomised controlled trials, Stenhoff et al., 2020). The Positive Psychology Intervention did not provide a similar outcome – the quality of life of participants of this training did not improve significantly between measurements. However, the original intervention (Saligman et al., 2005) aimed at fostering happiness, which construct was not measured in this study and it is possible that the gains of participants were in the domain of this construct. The authentic happiness in the positive psychology tradition embraces the subjective content reflecting psychical well-being such as positive emotions, flow, sense of purpose (Czapiński, 2015; Diener, Oishi, & Tay, 2018; Trzebińska, 2008). The current study assesses quality of life in the perspective of objective factors that can influence subjective well-being (WHO, 2022; Tan et al., 2020; Yun, Lee, & Lee, 2022).

Quality of life is an important treatment outcome, as research has indicated that after correcting for psychopathology, low level of wellbeing is convergent with worse somatic health, increased risk of developing mental disorder, and decreased social functioning (Keyes, 2007; Keyes, Dhingra & Simoes, 2010; Wood & Joseph, 2010).

Psychopathological symptoms. The results of the conducted statistical analyses showed that the levels of depression, anxiety and psychological stress did not decrease between measurements. Therefore, it indicates that hypotheses about the effectiveness of the ACT training in lowering the symptoms of anxiety, depression and psychological stress were not confirmed. In the current study the level of symptoms decreased but the change was not statistically significant.

The factor that could influence the lack of significant reduction in psychopathological symptoms was the period of time of conducting the study. It lasted from August to November 2021 – the period of "fourth wave" of COVID-19 in Poland (Dziedzic et al., 2022). At the beginning of the study, older adults could feel anxious due to the prediction of a forthcoming wave and the second measurement occurred in the midst of it. The results of the study could have been affected by an extraordinary and unexpected situation in the world (Hayes, Hofmann, & Stanton, 2020).

The results of the current study are contrary to compelling body of research reporting the decrease in the level of psychopathological symptoms after ACT-based interventions (e.g. Fledderus et al., 2011; A-Tjak et al., 2015; Bluett et al., 2014; Hayes et al., 2016; Roemer et al., 2008). However, a great deal of evidence based research comprised clinical samples, which could affect greater symptom reductions. In the current research, the baseline level of anxiety was moderate; mean level of depression was mild; and mean level of stress was normal according to DASS norms. Thus, when considering baseline mean levels of these symptoms, the intervention may have been perceived as unnecessary. However, the

qualitative research or mixed-method model of research would be more applicable to detect if the pattern of change was different for individuals with elevated levels of depression, anxiety and stress. For example, in the current study the mean anxiety level at baseline was moderate. However, at baseline 32.3% of participants experienced anxiety at the extremely severe level and in the second measurement the anxiety at this level was reported by 17.7% of researched people. Again, the qualitative research could depict the nature of these changes. Herein, it is valid to state that after the intervention in the current study the level of anxiety decreased significantly among the participants with extremely severe levels of anxiety at the baseline measurement. Thus, both interventions were effective in lowering the anxiety levels for people experiencing elevated levels of anxiety at the baseline measurement. The current findings warrant further examination and research in this domain, as older adults experiencing excessive levels of psychopathological symptoms are at risk of an array of adverse outcomes, including greater functional impairment, faster rate of cognitive deterioration and decreased quality of life (Petkus & Wetherell, 2013).

Psychological flexibility. As far as the key processes of change in the ACT model are concerned, there was a significant change between measurements in the level of psychological flexibility and its selected components: acceptance, defusion and contact with the present moment only in the experimental group. These results are congruent with the aim of ACT interventions, as they focus on increasing psychological flexibility, and not on lowering of psychopathology.

The change in values in the current study occurred in both groups between measurements. The change in the experimental group is in line with the fact that stimulating people toward value-based and engaged living is an explicit goal of ACT. This result is also consistent with the premises of Positive Psychology, which promote living life according to one's values. It is also coherent with the life span development theories as SOC theory

(Baltes, 1997), and SST (Carstensen et al., 2003). According to the SOC model, older adults select values-oriented activities that are achievable with limited resources and bring a sense of achievement, which lead to wellbeing. The pursuit of emotionally meaningful goals in older adults is connected with limited time perspective (Carstensen et al., 2003; Fung & Carstensen, 2006). According to WHO guidelines life according to one's values is an essential component of healthy aging. Thus the findings of current study concerning the effectiveness of both ACT and Positive Psychology Intervention in increasing the level of valued living indicate the potential applicability of these interventions as tools to foster successful aging.

In the current study, the change in psychological flexibility and its components (mindfulness, acceptance and defusion) mediated the increasing quality of life between measurements in the experimental group. Moreover, psychological flexibility and defusion were mediators of psychological stress symptoms reduction.

The change in psychological flexibility and its selected components between measurements is a promising result implicating that ACT-based intervention is effective in building psychological flexibility.

ACT-based intervention is potentially of high value for older adults experiencing elevated levels of psychopathological stress and use avoidant coping strategies. The ACT intervention in the current study incorporated such processes as values, acceptance, defusion and committed action that motivate participants to actively engage in pleasurable, values-oriented activities despite the adversities, declines and losses connected with aging. Process of defusion promoted disengagement from self-critical thinking. Involvement in valued activities is one of the protective factors leading to psychological adaptation (Fiske, Wetherell, & Gatz, 2009) as it is outlined in the Model of Sustainable Mental Health (Bohlmeijer & Westerhof, 2021).

The other mechanism of change that mediated the increasing quality of life was the aware contact with the present moment (mindfulness). This process promotes a non-judgemental awareness of thoughts, feelings and physical sensations as they arise. Mindfulness encourages direct flexible experiencing from moment to moment, antithetical to being caught up in ruminative thoughts about these experiences. The emphasis is put on non-judgmental, observing perspective in embracing experience, contrary to focusing on past failures and disappointments in rumination (Desrosiers et al., 2013). Mindfulness is an opposing process to experiential avoidance. It fosters open and accepting attitude towards emotions, thoughts and sensations in the here and now (Hayes et al., 2006).

The findings of the current study regarding the change in psychological flexibility and its components between measurements after ACT-based intervention, and identifying the mechanisms of change active in ACT, are in line with a growing body of research on the effectiveness of ACT and its processes of change (Fledderus et al., 2012; Scott et al., 2016; Bluett et al., 2014; Cavanagh et al., 2014; Lillis & Kendra, 2014; Wicksell et al., 2013; Stockton et al., 2018; Thompson et al., 2021; Levin, Lillis, & Hayes, 2012; Hayes et al., 2006; Levin et al., 2012; Pots et al., 2016).

As it was mentioned before, the study was conducted during the period of COVID-19 pandemic in Poland (Dziedzic et al., 2022). Due to this fact, it was assumed that older adults would experience excessive loneliness as the consequence of social distancing and isolation, which can have adverse effects on mental health (Wang et al., 2018).

Subsequently, it was hypothesised that the level of loneliness would moderate the change in psychological symptoms and/or quality of life. The results of statistical analyses did not confirm this hypothesis. The sense of loneliness did not determine whether the participants achieved the gains from the treatment in the form of increasing the quality of life.

Relative strengths of current research. The relative strength of current research is that it was well powered, incorporating a representative sample of individuals above 60 years old.

All participants attended the places of daily residence for older adults and were not supported by adequate psychological care due to various reasons. The high percentage of individuals with elevated levels of psychopathology indicate that they remained underserved in the domain of mental health. They were predominantly dwellers of villages and small towns. Thus, the strength of the current study is reaching the underserved community dwellers samples in the areas far from mental health support centres.

Another strength of this study is the design of a randomised controlled trial, which allows comparison of the results across groups and measures together with analysing interaction effects and processes of change (Campbell & Stanley, 2015).

The current research was carefully designed and conducted in line with previous recommendations in reviews of the ACT evidence base (e.g. Ost, 2008; Powers et al., 2009) and Consort 2010 Statement (Moher, 2012), which revised the guidelines for reporting RCTs. The current research meets the specified recommendations regarding employing as rigorous methodologies possible, including: representative samples, random assignment to treatments, inclusion of waiting list and/or psychological placebo control groups, comparison with a treatment of proven efficacy, use of reliable and valid outcome measures, reasonable numbers of therapists involved in trials (to avoid therapist effects) with good levels of experience, monitoring of treatment adherence, and control of concomitant treatments (Ost, 2009). The considerable effort was made to fulfil the specified requirements in the current study.

Weaknesses and limitations. The weakness of the study was the lack of the cognitive state assessment, while cognitive decline can be screened with the use of brief clinician administered tests, such as MMSE and the Clock-Drawing Test. However, this measurement

was not feasible due to practical constraints in the current research. Another study limitation that should also be mentioned, in that the participants widely varied in age (60 to 90 years old). Future studies should therefore replicate the experiment among participants with narrower age ranges. The Polish experimental version of MPFI was administered in the study, but there has been no validation of an instrument made in the Polish sample yet. The RCT without clusters would give more precise results concerning the processes measured in the population of older adults.

A substantial imitation of the study that should be addressed in future research was the lack of the follow up measurement. Although the neuroplasticity processes are present across lifespan (Mahncke, Bronstone, & Merzenich, 2006), it is necessary to remember that the processes of learning are slower in late adulthood. The training in this age group needs to last a substantial period of time, be performed without time pressure and require the use of different components of working memory in order for the intervention to be effective and long-lasting (Logie, Horne, Pettit, 2015; Verhaeghen, 2022; Chojak, 2019). The substantial permanent changes in the psychological processes of older adults need to be supported by the prolonged interventions, thus the gains from the ACT-based intervention may be maintained by the access to the modules of the programme in the mobile application.

7. SUMMARY, CONCLUSION AND IMPLICATIONS

Summary. The scientific aim of the dissertation was assessing the effectiveness of an original intervention based on the premises of ACT model among older adults in Poland. In order to fulfil this objective, two cluster randomised controlled trials were conducted. The effectiveness of the intervention was operationalized as lowering the level of psychopathological symptoms (depression/ anxiety/ psychological stress) and/or increasing the quality of life after the intervention. The research has been the first randomised controlled trial assessing the effectiveness of ACT-based intervention in Poland. It has also added value to the scarce ACT research among older adults in general.

The main hypotheses of the research were confirmed: ACT-based training was effective in increasing the quality of life and in the reduction of the psychopathological symptoms (in first study).

The focus of the ACT model is on applying core processes: mindfulness, acceptance, values, commitment and behaviour change leading to the creation of psychological flexibility and consequently to higher quality of life and lowering of psychopathological symptoms (Hayes et al, 2006; Hayes, 1999). The studies of this research have confirmed the efficacy of an ACT-based programme in increasing the quality of life of older adults and lowering symptoms of stress, anxiety and depression (in first study). Additionally, the mediation models in the second study detected that core ACT processes were mediating the increase in quality of life and lowering the symptoms of stress. Moreover, the results of the moderation analysis of cognitive functioning in the role of moderator in the first study implied that ACT-based training may be effective regardless of the participants' level of cognitive functioning (Chojak, 2021). The deterioration of cognitive functions in late adulthood does not necessarily mean functional impairment. The results of the second study of the current research confirmed that some of the processes may be trained until late life. The neuroplasticity

processes present across the lifespan enabled the enhancement in psychological flexibility as demonstrated among participants of the experimental group in the second study. The desirable change in psychological flexibility did not occur among participants of the experimental group in the first study, which may be due to the shorter length of the programme. Although the very protocol was the same, the amount of exercises to be done at home on a regular basis between the sessions was significantly higher in the second study. Thus, the time frames of the procedure should be customised to older participants for the change to be detected.

Conclusions. The results of the current study and the review of literature found that ACT-based intervention may potentially be highly appropriate for the older adults population, given their broad focuses, and the notion that such interventions do not seek to change or challenge cognitive content but rather foster acceptance and achieving valued-oriented goals. Regarding the cognitive deterioration in late adulthood, the functioning of working memory may be enhanced by involvement in values and committed action processes because focusing on meaningful items fosters remembering. The cognitive functions impairment applies also to attention processes. The mindfulness skills embedded in ACT may serve as a tool for attention training. In both studies of the current research the contact with the present moment increased after participation in the ACT-based intervention. The mindfulness exercises in *Arte Vitae* intervention protocol included breathing exercises. Their effectiveness might have been beneficial for alleviating the stress symptoms, which can be connected with the activity of the parasympathetic nervous system. This system is responsible for dampening the stress response and bringing the body to balance. The key part of the parasympathetic system – the vagus nerve has recently received a lot of scientific attention (Breit et al., 2018; Porges, 2001) due to its connections with breathing and the possibility of soothing the stress response.

The significance of the results of the current research is relevant due to the current socio demographic situation in the world (Beard et al., 2017). The number of older people has

been increasing in recent years and supporting them in maintaining or reaching an adequate level of the quality of life poses a substantial challenge for all societies. The means of supporting aging populations claim more research in order to pursue older people's needs and establish the pathways of prevention and care. Among the main issues concerning ageing and mental health are prevention and quality of life interventions (Fernandes & Paúl, 2017; Whyte & Rovner, 2006; Cuijpers et al., 2015). The findings of the current research are in line with these guidelines. The obtained results demonstrated that intervention based on ACT increased the quality of life for participants, which is congruent with the WHO agenda recommendations for supporting older adults (WHO, 2015; Beard et al., 2017). The results also confirmed the applicability of ACT-based intervention within the framework of the Model of |Sustainable Mental Health (Bohlmeijer & Westerhof, 2021) as the outcome of the intervention was both increasing wellbeing (in both studies) and decreasing psychopathological symptoms (in first study). Identifying psychological flexibility as a mechanism of change in increasing quality of life and reduction of psychological stress symptoms in the second study of the current research shows that psychological flexibility is a core adaptation process as outlined in MSMH (Bohlmeijer & Westerhof, 2021). It is particularly important in the case of the older population as ageing is connected with many challenges including different losses, physical problems or cognitive deterioration. The adaptation processes, as conceptualised in Model of Sustainable Mental Health (Bohlmeijer & Westerhof, 2021) enable maintaining equilibrium between acceptance of inevitable losses in different domains of life and meaningful living. The results of the second study of the current research demonstrated acceptance enhancement after the ACT training. This core ACT process fosters embracing the impairments and losses connected with aging with the perspective of focusing on attainable values-oriented goals.

As epidemiological research shows, many older adults are experiencing high rates of subclinical anxiety and depression accompanied by increased distress related to ageing and everyday life challenges (Chatterji et al., 2015; Von Hecker et al., 2006; Fiske, Wetherell, & Gatz, 2009; Knight & Pachana, 2015, Bidzan, 2017). The baseline measurements of current research demonstrated that elevated levels of psychopathological symptoms in some of the participants were either undiagnosed or at the subthreshold level. The occurrence of psychopathological symptoms, including anxiety, depression and psychological stress symptoms which, experienced excessively, may lead to lowering of the psychological well-being and have a negative impact on mental and somatic health of older people (Grenier et al., 2011; Witlox et al., 2021). The research shows that older adults with increased anxiety levels presented poorer processing speed, shifting attention and inhibition (Beaudreau, & O'Hara, 2009). On the other hand, according to the research and literature, the executive functions impairments may constitute risk factors, maintaining mechanisms and impairing outcomes of several psychopathologies (Sharp, Miller, & Heller, 2015; Snyder et al., 2014; Snyder, 2013). Thus the relationship between cognitive decline and anxiety is considered to be bidirectional. Research also showed that anxiety may be associated with progression of functional disability of older adults (Brenes et al., 2005). Therefore addressing the elevated levels of anxiety via interventions such as ACT have the potential of preventing or postponing the functional impairments of older adults. In the current research after ACT-based intervention the psychopathological symptoms decreased in the first study and the intervention was effective in lowering the elevated symptoms of anxiety in the second study.

Implications and potential future research. Despite some limitations, the current research provided compelling evidence to the effectiveness of ACT-based intervention in increasing quality of life among older adults. The results of the current research support the possible applicability of ACT-based interventions among older adults. They could potentially

inform clinicians tailoring interventions for this cohort. The author believes that this study makes a significant contribution to evidence-based literature on the effectiveness of ACT. The promising results of the current research should warrant further investigation of the effectiveness of ACT- based interventions among older adults. The *Arte Vitae* intervention protocol may be further used by clinicians or social workers who work with older adults in Poland. Some minor alterations may be recommended. For example, the values clarification module could be moved to the first section of the intervention protocol. Older adults may be more engaged in the intervention, when it starts with the values module (Petkus & Wetherell, 2013). Older adults may detach from one's life values due to occurrence of some significant life events specific to this developmental stage. The retirement, losses of the loved ones, cognitive and functional impairments or chronic conditions may predispose to losing contact with life values and may render some of the current goals physically unattainable. The values clarification is therefore a significant process helping to replace unachievable goals with attainable ones that are in line with life values (Petkus & Wetherell, 2013).

As older adults face difficulties with reaching the mental health care system, especially in remote areas far from therapeutic centres (Wolitzky-Taylor, 2010; Gum, Iser, & Petkus, 2010; Kelson et al., 2017). This constitutes a major public health issue that requires attention from policymakers and practitioners (Biglan, Hayes, & Pistorello, 2008). Thus, there is an exigent need of implementing the easy and widely available interventions with reliable effectiveness to improve well-being and mental health aimed at older people (Witlox, 2021). Evidence based research, not only provides validity for effectiveness of strategies and interventions, but also stimulates decisions and actions (Biglan, Hayes, & Pistorello, 2008). The first study in the current research was cited in a recent systematic review of the studies concerning the therapeutic effects of ACT on anxiety in older adults (Delhom, Mateu-Mollá, & Lacomba-Trejo, 2022), adding its share to evidence based research in this age group.

The results of the current research imply that ACT-based intervention can be recommended for implementation in care homes, residence centres and other institutions providing support for older adults.

The growing body of research shows the effectiveness of ACT-based interventions delivered online or in the form of mobile applications in the range of psychological and health problems (Fledderus et al., 2012; Pots et al., 2016; Van de Graaf et al., 2021; Scott et al., 2021; Herbert e al., 2022) or in increasing quality of life (Boettcher et al., 2014; Scott et al., 2021). Thus, the potential of delivering ACT interventions via mobile application is also recommended in order to reach older adults who live far from the centres of mental health support. An intervention in the form of a self-help book or a mobile application could deliver support to people in danger of social exclusion who live far from the centres of psychological support. The future research in this domain is warranted. This issue will be addressed in the next research of the author of the current study. The mobile application tailored to the needs of older adults based on the *Arte Vitae* programme has been already created. It is accessible at web page https://artevitae.pl/ or at GooglePlay and AppleStore as a mobile application entitled ‘Arte Vitae. Moc zaangażowanego działania’.

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1. The Acceptance and Action Questionnaire -2 (AAQ-2; Bond et al., 2011)
2. World Health Organization Quality Of Life –AGE scale (WHOQL- AGE)
3. Depression Anxiety & Stress Scale, short version, (DASS-21; Lovibond, 1995)
4. Brief Experiential Avoidance Questionnaire (BEAQ; Gámez et al., 2014)
5. Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003)
6. Valued Living Questionnaire (VLQ; Wilson & Groom, 2002)
7. Multidimensional Psychological Flexibility Inventory, short version (acceptance and experiential avoidance items - full version; MPFI, Rolffs et al., 2016)
8. 11-item De Jong Gierveld Loneliness Scale (De Jong-Gierveld & Kamphuls, 1985)

12. APPENDICES

AAQ-2

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

1.	Its OK if I remember something unpleasant.	1	2	3	4	5	6	7
2.	My painful experiences and memories make it difficult for me to live a life that I would value.	1	2	3	4	5	6	7
3.	I'm afraid of my feelings.	1	2	3	4	5	6	7
4.	I worry about not being able to control my worries and feelings.	1	2	3	4	5	6	7
5.	My painful memories prevent me from having a fulfilling life.	1	2	3	4	5	6	7
6.	I am in control of my life.	1	2	3	4	5	6	7
7.	Emotions cause problems in my life.	1	2	3	4	5	6	7
8.	It seems like most people are handling their lives better than I am.	1	2	3	4	5	6	7
9.	Worries get in the way of my success.	1	2	3	4	5	6	7
10.	My thoughts and feelings do not get in the way of how I want to live my life.	1	2	3	4	5	6	7

Revised date (4 October 2006)

WHOQOL-AGE

We would like you to think about your life in the last two weeks. Thinking about the last two weeks…

		VERY BAD	BAD	NEITHER BAD NOR GOOD	GOOD	VERY GOOD
Q1	How would you rate your quality of life?	1	2	3	4	5

		VERY DISSATISFIED	DISSATISFIED	NEITHER SATISFIED NOR DISSATISFIED	SATISFIED	VERY SATISFIED
Q2	How satisfied are you with your hearing, vision or other senses overall?	1	2	3	4	5
Q3	How satisfied are you with your health?	1	2	3	4	5
Q4	How satisfied are you with yourself?	1	2	3	4	5
Q5	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
Q6	How satisfied are you with your personal relationships?	1	2	3	4	5
Q7	How satisfied are you with the conditions of your living place (your home)?	1	2	3	4	5
Q8	How satisfied are you with the way you use your time?	1	2	3	4	5

The following questions ask about how completely you experienced or were able to do certain things in the last two weeks.

		NOT AT ALL	A LITTLE	MODERATELY	MOSTLY	COMPLETELY
Q9	Do you have enough energy for everyday life?	1	2	3	4	5
Q10	How much control do you have over the things you like to do?	1	2	3	4	5
Q11	To what extent are you satisfied with your opportunities to continue achieving in life?	1	2	3	4	5
Q12	Do you have enough money to meet your needs?	1	2	3	4	5

		NOT AT ALL	A LITTLE	A MODERATE AMOUNT	VERY MUCH	AN EXTREME AMOUNT
Q13	How satisfied are you with your intimate relationships in your life?	1	2	3	4	5

For details about how to score WHOQOL-AGE please see: Caballero FF, Miret M, Power M, Chatterji S, Tobiasz-Adamczyk B, Koskinen S, Leonardi M, Olaya B, Haro JM, Ayuso-Mateos JL. Validation of an instrument to evaluate quality of life in the aging population: WHOQOL-AGE. Health Qual Life Outcomes. 2013 Oct 23;11:177.

DASS21

Name: *Date:*

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

doi: 10.1037/t29842-000

Brief Experiential Avoidance Questionnaire

Items

Please indicate the extent to which you agree or disagree with each of the following statements.

1	2	3	4	5	6
strongly disagree	moderately disagree	slightly disagree	slightly agree	moderately agree	strongly agree

1.	The key to a good life is never feeling any pain.	1	2	3	4	5	6
2.	I'm quick to leave any situation that makes me feel uneasy.	1	2	3	4	5	6
3.	When unpleasant memories come to me, I try to put them out of my mind.	1	2	3	4	5	6
4.	I feel disconnected from my emotions.	1	2	3	4	5	6
5.	I won't do something until I absolutely have to.	1	2	3	4	5	6
6.	Fear or anxiety won't stop me from doing something important.	1	2	3	4	5	6
7.	I would give up a lot not to feel bad.	1	2	3	4	5	6
8.	I rarely do something if there is a chance that it will upset me.	1	2	3	4	5	6
9.	It's hard for me to know what I'm feeling.	1	2	3	4	5	6
10.	I try to put off unpleasant tasks for as long as possible.	1	2	3	4	5	6
11.	I go out of my way to avoid uncomfortable situations.	1	2	3	4	5	6
12.	One of my big goals is to be free from painful emotions.	1	2	3	4	5	6
13.	I work hard to keep out upsetting feelings.	1	2	3	4	5	6
14.	If I have any doubts about doing something, I just won't do it.	1	2	3	4	5	6
15.	Pain always leads to suffering.	1	2	3	4	5	6

Note. To score, first reverse key Item 6 (i.e., subtract the value from 7), then sum all items.

The Mindful Attention Awareness Scale (MAAS)

The trait MAAS is a 15-item scale designed to assess a core characteristic of mindfulness, namely, a receptive state of mind in which attention, informed by a sensitive awareness of what is occurring in the present, simply observes what is taking place.

Brown, K.W. & Ryan, R.M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84,* 822-848.

Carlson, L.E. & Brown, K.W. (2005). Validation of the Mindful Attention Awareness Scale in a cancer population. *Journal of Psychosomatic Research, 58,* 29-33.

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be. Please treat each item separately from every other item.

1	2	3	4	5	6
almost always	very frequently	somewhat frequently	somewhat infrequently	very infrequently	almost never

_____ 1. I could be experiencing some emotion and not be conscious of it until some time later.
_____ 2. I break or spill things because of carelessness, not paying attention, or thinking of something else.
_____ 3. I find it difficult to stay focused on what's happening in the present.
_____ 4. I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.
_____ 5. I tend not to notice feelings of physical tension or discomfort until they really grab my attention.
_____ 6. I forget a person's name almost as soon as I've been told it for the first time.
_____ 7. It seems I am "running on automatic," without much awareness of what I'm doing.
_____ 8. I rush through activities without being really attentive to them.
_____ 9. I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there.
_____ 10. I do jobs or tasks automatically, without being aware of what I'm doing.
_____ 11. I find myself listening to someone with one ear, doing something else at the same time.
_____ 12. I drive places on 'automatic pilot' and then wonder why I went there.
_____ 13. I find myself preoccupied with the future or the past.
_____ 14. I find myself doing things without paying attention.
_____ 15. I snack without being aware that I'm eating.

Scoring: To score the scale, simply compute a mean (average) of the 15 items.

Valued Living Questionnaire

Below are domains of life that are valued by some people. We are concerned with your subjective experience of your quality of life in each of these domains. One aspect of quality of life involves the importance one puts on the different domains of living. Rate the importance of each domain (by circling a number) on a scale of 1 to 10; 1 means that domain is not at all important, and 10 means that domain is very important. Not everyone will value all of these domains, or value all domains the same. Rate each domain according to *your own personal sense of importance*.

In this section, we would like you to give a rating of how *consistent* your actions are with each value. Everyone does better in some domains than others. We are NOT asking about your ideal in each domain. We want to know how you think you have been doing **during the past week**. Rate each item (by circling a number) on a scale of 1 to 10; 1 means that your actions have been fully inconsistent with your value, and 10 means that your actions have been fully consistent with your value.

During the past week

Domain	not at all important									extremely important
1. Family relations (other than marriage or parenting)	1	2	3	4	5	6	7	8	9	10
2. Marriage/couples/ intimate relations	1	2	3	4	5	6	7	8	9	10
3. Parenting	1	2	3	4	5	6	7	8	9	10
4. Friendships/social relations	1	2	3	4	5	6	7	8	9	10
5. Employment	1	2	3	4	5	6	7	8	9	10
6. Education/training	1	2	3	4	5	6	7	8	9	10
7. Recreation	1	2	3	4	5	6	7	8	9	10
8. Spirituality	1	2	3	4	5	6	7	8	9	10
9. Citizenship/ community life	1	2	3	4	5	6	7	8	9	10
10. Physical well-being	1	2	3	4	5	6	7	8	9	10

Domain	not at all consistent									extremely consistent
1. Family relations (other than marriage or parenting)	1	2	3	4	5	6	7	8	9	10
2. Marriage/couples/ intimate relations	1	2	3	4	5	6	7	8	9	10
3. Parenting	1	2	3	4	5	6	7	8	9	10
4. Friendships/social relations	1	2	3	4	5	6	7	8	9	10
5. Employment	1	2	3	4	5	6	7	8	9	10
6. Education/training	1	2	3	4	5	6	7	8	9	10
7. Recreation	1	2	3	4	5	6	7	8	9	10
8. Spirituality	1	2	3	4	5	6	7	8	9	10
9. Citizenship/community life	1	2	3	4	5	6	7	8	9	10
10. Physical well-being	1	2	3	4	5	6	7	8	9	10

Multidimensional Psychological Flexibility Inventory (MPFI)

FLEXIBILITY_SUBSCALES

ACCEPTANCE

IN THE LAST TWO WEEKS…	Never TRUE	Rarely TRUE	Occasionally TRUE	Often TRUE	Very Often TRUE	Always TRUE
I was receptive to observing unpleasant thoughts and feelings without interfering with them.	O	O	O	O	O	O
I tried to make peace with my negative thoughts and feelings rather than resisting them	O	O	O	O	O	O
I made room to fully experience negative thoughts and emotions, breathing them in rather than pushing them away	O	O	O	O	O	O
When I had an upsetting thought or emotion, I tried to give it space rather than ignoring it	O	O	O	O	O	O
I opened myself to all of my feelings, the good and the bad	O	O	O	O	O	O

PRESENT MOMENT AWARENESS

IN THE LAST TWO WEEKS…	Never TRUE	Rarely TRUE	Occasionally TRUE	Often TRUE	Very Often TRUE	Always TRUE
I was attentive and aware of my emotions	O	O	O	O	O	O
I was in tune with my thoughts and feelings from moment to moment	O	O	O	O	O	O

SELF AS CONTEXT

IN THE LAST TWO WEEKS…	Never TRUE	Rarely TRUE	Occasionally TRUE	Often TRUE	Very Often TRUE	Always TRUE
Even when I felt hurt or upset, I tried to maintain a broader perspective	O	O	O	O	O	O
I carried myself through tough moments by seeing my life from a larger viewpoint	O	O	O	O	O	O

DEFUSION

IN THE LAST TWO WEEKS…	Never TRUE	Rarely TRUE	Occasionally TRUE	Often TRUE	Very Often TRUE	Always TRUE
I was able to let negative feelings come and go without getting caught up in them	O	O	O	O	O	O
When I was upset, I was able to let those negative feelings pass through me without clinging to them	O	O	O	O	O	O

VALUES

IN THE LAST TWO WEEKS...	Never TRUE	Rarely TRUE	Occasionally TRUE	Often TRUE	Very Often TRUE	Always TRUE
I was very in-touch with what is important to me and my life	O	O	O	O	O	O
I stuck to my deeper priorities in life	O	O	O	O	O	O

COMMITTED ACTION

IN THE LAST TWO WEEKS...	Never TRUE	Rarely TRUE	Occasionally TRUE	Often TRUE	Very Often TRUE	Always TRUE
Even when I stumbled in my efforts, I didn't quit working toward what is important	O	O	O	O	O	O
Even when times got tough, I was still able to take steps toward what I value in life	O	O	O	O	O	O

INFLEXIBILITY_SUBSCALES

EXPERIENTIAL AVOIDANCE

IN THE LAST TWO WEEKS...	Never TRUE	Rarely TRUE	Occasionally TRUE	Often TRUE	Very Often TRUE	Always TRUE
When I had a bad memory, I tried to distract myself to make it go away	O	O	O	O	O	O
I tried to distract myself when I felt unpleasant emotions	O	O	O	O	O	O
When unpleasant memories came to me, I tried to put them out of my mind	O	O	O	O	O	O
When something upsetting came up, I tried very hard to stop thinking about it	O	O	O	O	O	O
If there was something I didn't want to think about, I would try many things to get it out of my mind	O	O	O	O	O	O

LACK OF CONTACT WITH THE PRESENT MOMENT

IN THE LAST TWO WEEKS...	Never TRUE	Rarely TRUE	Occasionally TRUE	Often TRUE	Very Often TRUE	Always TRUE
I did most things on "automatic" with little awareness of what I was doing.	O	O	O	O	O	O
I did most things mindlessly without paying much attention.	O	O	O	O	O	O

SELF AS CONTENT

IN THE LAST TWO WEEKS...	Never TRUE	Rarely TRUE	Occasionally TRUE	Often TRUE	Very Often TRUE	Always TRUE
I thought some of my emotions were bad or inappropriate and I shouldn't feel them	O	O	O	O	O	O
I criticized myself for having irrational or inappropriate emotions	O	O	O	O	O	O

FUSION

IN THE LAST TWO WEEKS...	Never TRUE	Rarely TRUE	Occasionally TRUE	Often TRUE	Very Often TRUE	Always TRUE
Negative thoughts and feelings tended to stick with me for a long time.	O	O	O	O	O	O
Distressing thoughts tended to spin around in my mind like a broken record.	O	O	O	O	O	O

LACK OF CONTACT WITH VALUES

IN THE LAST TWO WEEKS...	Never TRUE	Rarely TRUE	Occasionally TRUE	Often TRUE	Very Often TRUE	Always TRUE
My priorities and values often fell by the wayside in my day to day life.	O	O	O	O	O	O
When life got hectic, I often lost touch with the things I value	O	O	O	O	O	O

INACTION

IN THE LAST TWO WEEKS...	Never TRUE	Rarely TRUE	Occasionally TRUE	Often TRUE	Very Often TRUE	Always TRUE
Negative feelings often trapped me in inaction.	O	O	O	O	O	O
Negative feelings easily stalled out my plans.	O	O	O	O	O	O

11-item De Jong Gierveld Loneliness Scale

		None of the time	Rarely	Some of the time	Often	All of the time
1	There is always someone I can talk to about my day-to-day problems					
2	I miss having a really close friend					
3	I experience a general sense of emptiness					
4	There are plenty of people I can lean on when I have problems					
5	I miss the pleasure of the company of others					
6	I find my circle of friends and acquaintances too limited					
7	There are many people I can trust completely					
8	There are enough people I feel close to					
9	I miss having people around me					
10	I often feel rejected					
11	I can call on my friends whenever I need them					