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Depression

What Is New and What Is Old in Human Existence

Edited by Federico Durbano, Floriana Irtelli and Barbara Marchesi

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Meet the editors

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Contents

Preface

Depression continues to be one of the most frequent and disabling mental disorders (see the 2023 WHO report); it is estimated that 3.8% of the global population may suffer from a clinically significant form of depression, with prevalence differing among sexes. Epidemiological data also correlate depression with exposure to stressful factors or traumatic events, both recent and during developmental age. The same data highlights how only 25% of subjects with depressive syndrome access adequate care on a continuous basis.

Among the determinants of depression, according to the bio-psycho-social model, there are various factors predisposing one to depression as well as external factors with autonomous force, in particular, the increasingly frequent adverse life events that the contemporary world offers us (unemployment, diseases, wars, social instability).

Another key element is linked to the close relationship between depression and physical health. There are increasingly evident correlations between physical health and mental health mediated by biological factors (through the immune system), but there are also relevant correlations between mental health and lifestyles that have a negative impact on physical health (substance/alcohol abuse, unbalanced diet, sedentary lifestyles).

Among the effective treatments, there are specific drugs that are effective only for the most severe forms of depression. For mild- or medium-severity depression, the experimental data highlight an equivalence if not a relative superiority of non-pharmacological interventions. Some psychotherapies are more effective than others, but new non-pharmacological, non-psychotherapeutic treatment models are also emerging that have shown significant clinical effectiveness.

A particularly interesting theme is linked to the cultural influence on the clinical manifestations of depression. Experience shows us how different generations deal with mental suffering in different ways, based on different cultural approaches and based on the different social realities in which that generation has developed.

Another topic of particular interest concerns the influence that the new means of communication have on the development and manifestations of depression. It is part of the common feeling that the new means of communication have had a notable impact on the relational and communicative dynamics between people, resulting in some cases in a loosening of proximity networks and therefore an impoverishment of resources to cope with adversity. Equally important, however, is the immense willingness to use network resources to manage one's problems with less effort than in previous decades. It is therefore a question of adequately evaluating the pros and cons of these new opportunities to adequately manage the risks and benefits.

The role of the media is also important in the dynamics of amplifying exposure to trauma: wars, poverty, and unemployment are social factors that have always been

present and have always had a pathoplastic role in mood disorders. In current times, however, it seems that these factors have a more significant role probably also due to the diffusion and unmediated information redundancy (infodemia) linked to the diffusion of a communication system rich in content but poor in meaning. Therefore, an evaluation of the impact of traumatic factors on the development of depressive disorders must necessarily consider the aspects of social communication.

Furthermore, our contemporary civilization is increasingly critical of traditional approaches to solving problems, in particular those of the psychic sphere. There are numerous ideas for alternative interventions, some of which have also led to interesting innovative treatment models (for example, mindfulness), just as there has been a flourishing of extemporaneous interventions poorly supported by scientific evidence. The use of innovative methods, often based on traditional medicine, must certainly have room for development provided, however, that they can be scientifically validated. In other words, every innovation must be subject to rigorous scientific research that univocally highlights the results of at least non-inferiority compared to other therapeutic approaches. Traditional Chinese medicine is making great strides in this direction, moving away from an individual and almost shamanic approach to expose itself to validation through precise research protocols. But other approaches, more of a social and rehabilitative nature, are also demonstrating their undoubted effectiveness, leaving the anecdotal phase to enter the objective one of scientific validation.

Finally, we must underline how depression is a "holistic" disease in the sense that it involves not only the world of the psyche but also the balance of the body; depression is significantly associated with a higher risk of cardiovascular, metabolic, infectious, and oncological diseases. The relationship is bidirectional in the sense that depression can represent a factor triggering such disorders, just as such disorders can be a traumatic element capable of breaking the individual's psychic homeostasis. Once this process begins, however, the two factors act in concert in a sort of self-reinforcing loop. Managing depression without considering the somatic repercussions, and vice versa, means doing a half-assed job, which can lead to long-term complications.

The meaning of this book is therefore to logically and cohesively correlate all these problems, providing some elements for thought on which to build an updated and modern clinical practice. We thank all the authors who contributed to this work, hoping to contribute to the further development of clinical knowledge.

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Chapter 1

Perspective Chapter: From the Boom to Gen Z – Has Depression Changed across Generations?

Gerasimos Konstantinou and Mohamed Attia

Abstract

The chapter delineates the intricate tableau of depression, scrutinizing its generational disparities and spotlighting salient elements such as stigma, resilience, awareness, the impact of the pandemic, and the ambivalent role of technology. Historically, the pervasive stigma surrounding mental health has obfuscated transparent dialogues and deterred help-seeking behaviors. Presently, generational shifts reveal an augmentation in awareness, predominantly among younger demographics, fervently advocating for destigmatization and transparent discussions. Resilience, manifesting divergently across age brackets, demonstrates that older adults typically exhibit amplified resilience, attributed to cumulative life experiences and substantial support networks. In contrast, younger individuals navigate through unique stressors like academic duress and the high-velocity digital epoch. Enhanced awareness of depression, fostered by targeted campaigns across demographics, may underpin early identification and interventions, mitigating the severity and chronic implications of depression. The COVID-19 pandemic has universally magnified feelings of despair and isolation, with technology proffering a double-edged sword, particularly for tech-dependent younger generations, by facilitating communication while potentially intensifying depressive symptoms through its excessive use and resultant social comparison. Hence, acknowledging generational distinctions in depression is imperative for sculpting efficacious interventions, aiming to foster a societal framework that staunchly supports mental well-being and adequately equips individuals to navigate their mental health challenges.

Keywords: depression, generations, resilience, stigma, awareness, pandemic, technology

1. Introduction

Depression continues to be a common, complex, and detrimental mental health disorder with a significant impact on society and individual quality of life, garnering attention over the years due to its pervasive and rising impact [1]. For several decades, the understanding, management, and recognition of Depression have evolved and changed significantly [2]. Notably, there has been a reduced stigma surrounding

mental health, which has helped increase awareness around the detection, management, and access to treatment for Depression [3].

The impact of Depression varies among different generations due to unique circumstances. Events, societal norms, technological advancements, and cultural shifts shape each generation. These factors contribute to the trends of Depression across generations [4]. However, it is essential to note that not everyone within a generation will follow these patterns as individuals' circumstances play a role. Factors such as socioeconomic status, family dynamics, and personal experiences contribute to the disparities in Depression within each generation [5]. Additionally, individuals born around the cusp may share traits and experiences from adjacent generations, creating a unique blend of characteristics. Thus, it is crucial to acknowledge both the generational trends and the variations within and across each generation when developing targeted interventions that address the diverse needs of individuals. Understanding these relationships becomes essential for promoting well-being across all generations as society continues evolving.

In this chapter, we aim to shed some light and explore how Depression has variably evolved within and across generations. We will examine the interplay between societal changes, technological advancements, and cultural and psychological factors, and we will explore the changing prevalence of Depression and nuanced variations in presentation, risk factors, and coping mechanisms that have emerged among different generational cohorts.

2. Generations and their distinct characteristics

2.1 The silent generation

Born between 1928 and 1945, the Silent Generation lived through challenging historical events, like the Great Depression and World War II. These experiences shaped their personality and outlook on life, affecting how they dealt with health issues [6]. The Silent Generation, who lived through challenges, faced societal norms discouraging open conversations about mental well-being. This complex dynamic affects how Depression is perceived within this generation [4, 5, 7, 8]. While their resilience in the face of adversity is commendable, it is essential to acknowledge that the traits that helped them survive may also hinder their willingness to seek assistance for health struggles. Growing up during the Great Depression taught them resourcefulness and frugality [7, 9]. Their involvement in World War II demanded courage and unity, which often led to them developing coping mechanisms. However, this collective resilience might have influenced their attitudes towards seeking help for health problems, potentially resulting in underreporting and undertreatment of Depression. The societal norms during the time of the Silent Generation emphasized being stoic and self-reliant. Showing vulnerability was seen as a weakness. As a result, discussing health struggles such as Depression became stigmatized [7]. This stigma may have discouraged many from seeking support or opening up to friends and family about their distress, possibly contributing to higher rates of untreated Depression. While the resilience of the Silent Generation is commendable, their exposure to traumas also made them susceptible to long-term psychological scars caused by enduring the Great Depression and participating in World War II. The limited discussion surrounding health issues may have caused some people of this generation to view suicide as relieving pain when mental health resources were scarce [10].

2.2 Baby boomers

Born between 1946 and 1964, the Baby Boomer generation emerged after World War II and experienced growth and societal changes. Their mental well-being is influenced by factors such as events, social norms, and evolving healthcare systems. They were shaped by the optimism of war recovery and economic progress but also witnessed significant events, like the Vietnam War, civil rights movements, and the counterculture revolution. These experiences contributed to an identity marked by idealism and skepticism, which could impact how they perceive health and cope with related challenges [6, 11, 12].

During the upbringing of the Baby Boomers, societal norms emphasized the importance of being strong and self-reliant. Talking openly about health issues, like Depression, was often seen as taboo, which could lead to underreporting and not getting treatment. As Baby Boomers went through stages of life, such as becoming parents or retiring, they faced changes in gender roles, careers, and family dynamics. These changes could have an impact on their well-being. Adapting to roles or trying to reconcile expectations with societal shifts might contribute to feelings of Depression. While Baby Boomers have witnessed advancements in healthcare over their lifetime, their attitude towards seeking professional help and the stigma surrounding mental health treatment can affect their willingness to utilize available services [6, 11–13]. Their resilience in dealing with changes and their contributions to movements can help them cope with mental health challenges. However, unresolved trauma from events like the Vietnam War or struggles adapting to changing roles may increase their vulnerability to Depression.

2.3 Generation X

This generation's individuals, born between 1965 and 1980 often find themselves overlooked between the cohorts of Baby Boomers and Millennials but hold a unique position in history. Generation X experienced a period of change that impacted their lives. Influenced by events like the end of the Cold War, advancements in technology, and evolving norms, their mental health experiences are nuanced. Generation X witnessed the fall of the Berlin Wall and the onset of the HIV crisis. Despite being sandwiched between the Baby Boomers and Millennials, Generation X's mental health perception often goes overlooked. They grew up with limited access to advanced technology and lacked the resources and education to address mental health issues effectively. These experiences shaped their identity as adaptable individuals who had to navigate transformations that challenged traditional values [4, 5, 14, 15]. As a result, their attitudes towards health may have been influenced, leading some to seek support when needed, while others may have internalized their struggles due to a sense of self-reliance. Rising divorce rates, dual-income households, and an increasing emphasis on individuality marked the cultural landscape during Generation X [8, 15]. These societal shifts could have impacted their well-being by affecting family dynamics and support networks. Additionally, their unique form of expression influenced by punk and alternative subcultures could also play a role in how they communicate and cope with the health challenges they encounter. For this generation, while the rise of computers and the advent of the internet technology played a role in shaping their communication patterns and offered opportunities for connection, it also presented challenges that could contribute to feelings of isolation or inadequacy as they navigated forms of interaction [16]. They joined the workforce during downturns, often

dealing with job insecurity and financial strain. Juggling the responsibilities of work and family life led to increased stress levels and a greater likelihood of experiencing Depression [3, 15].

2.4 Millennials

Millennials grew up between 1981 and 1996 during significant advancements and societal transformations. Often referred to as natives, millennials have witnessed a world characterized by technology adoption and evolving social norms. Growing up alongside the emergence of the internet and social media platforms, Millennials are both highly connected yet potentially isolated [3–6, 8, 17–19]. While technology grants them access to information and social networks, it also exposes them to cyberbullying, unrealistic comparisons, and the pressure to maintain an online persona. This dual reality can contribute to heightened Depression and diminished self-esteem [6, 20, 21]. Millennials entered the job market amidst periods of uncertainty, facing challenges such as student loan debt and underemployment. These financial pressures and expectations for achieving careers can contribute to anxiety and Depression among this generation. Additionally, a push for work-life balance and finding fulfillment in one's career adds complexity to one's mental health experiences [5, 14, 22, 23].

The millennial generation is renowned for its backgrounds and global perspectives [6]. However, grappling with the expectations placed on them by society and their cultural background can often create conflicts that impact their mental well-being. The struggle to reconcile their identity with the norms they are expected to adhere to can particularly lead to feelings of Depression, especially among those who face discrimination or other challenges related to their identity. Factors such as delaying marriage, parenthood, or homeownership may also contribute to a sense of inadequacy compared to generations or peers who achieved these milestones earlier. This feeling of not meeting societal expectations can be linked to an increased vulnerability towards Depression [3, 6, 22, 24, 25].

2.5 Generation Z

Born between 1997 and 2012 into a world shaped by technological advancements, Generation Z is the first generation that has never experienced life without the internet and social media. Navigating this transformed landscape comes with opportunities and distinct challenges for Generation Z [6, 26]. Growing up in an era where internet access and social media are ever-present, they are constantly exposed to amounts of information, constant connection, and comparisons with others. While social media allows for connectivity, it also amplifies feelings of inadequacy due to the fear of missing out (FOMO) and cyberbullying, contributing to depressive symptoms. Cyberbullying threatens Generation Z as their reliance on interactions makes them more susceptible to hurtful behavior facilitated by digital anonymity. Consequently, this exacerbates the mental struggles faced by this generation [6, 16, 20, 21, 24, 25].

It is worth noting that this generation shows an increasing awareness of health concerns [5, 22, 25]. However, this awareness only sometimes translates into seeking help when needed. Despite being more aware, a stigma surrounding health can discourage individuals from seeking support in online environments where vulnerability is often viewed negatively. Moreover, Generation Z faces academic competition and the pressure to prepare for an uncertain job market [22, 26–28]. These factors can contribute to increased stress levels, potentially leading to more depressive

symptoms, particularly when combined with the expectations of success perpetuated on social media platforms.

Generation Z is known for its participation in activism and advocacy [3, 6]. While this fosters a sense of community and purpose, it can also result in burnout due to the constant pressure to contribute to causes consistently. Additionally, this generation embraces gender identities and expressions openly. This progress is positive; however, exploring and expressing one's identity can be emotionally distressing.

Generation Z faces several challenges regarding their well-being due to their immersion in the digital world and abundant online digital information. Understanding their experiences, such as cyberbullying and online pressures, is crucial for developing interventions that address their mental health needs, such as promoting a sense of resilience by creating a safe and supportive online space and actively encouraging open conversations.

3. Resilience in depression among and within generations

In literature, resilience is defined as the "process of effectively negotiating, adapting to, or managing significant sources of stress or trauma" [29]. Different generations demonstrate distinct ways of resilience when confronting Depression, depending on a complex interplay of generational characteristics, societal attitudes, and coping strategies. Generational attitudes towards mental health play a pivotal role in shaping resilience. While older generations often view mental health challenges as personal struggles to be borne privately, younger generations emphasize the importance of open discussions and seeking professional help as crucial components of resilience [9, 29, 30].

Baby Boomers and the Silent Generation often exhibit resilience grounded in life experience. They may rely on traditional support networks, face-to-face interactions, and resilience built through previous adversities. However, mental health stigma might deter them from seeking professional help, potentially impacting their resilience [10]. Generation X individuals often display resilience stemming from their adaptability and pragmatism. They may be open to seeking therapy and mental health support when facing Depression, demonstrating a balanced approach that combines traditional and modern resources [7, 13, 15, 24]. On the other hand, Millennials, known for their advocacy and openness about mental health, often exhibit resilience by actively addressing Depression. They prioritize self-care, engage in therapy, and leverage online communities for support. Their willingness to discuss mental health challenges helps reduce stigma and fosters resilience [3, 4, 6, 23, 25]. Generation Z shows resilience in their adaptability and reliance on technology. They are more likely to seek digital mental health resources and online peer support, showcasing a different facet of resilience in navigating Depression. However, their heavy reliance on digital connections might challenge building offline resilience [20, 26–28, 31].

Over the years and through various research projects, it was found that Generation Z often did come out as less resilient when compared to other generations, and the variable resilience is domain-dependent [22, 25, 31, 32]. Recent studies highlighted that Generation Z is more likely to experience increased anxiety and Depression. The study reported a specific vulnerability to COVID-19 pandemic repercussions and highlighted that Generation Z, however, had a higher openness to change, which was a positive indication of the ability of Gen Z members to maintain resilience facing forward [24, 31]. Flexibility and openness to engage in new attitudes like hybrid training

or work were not dissimilar between Generations X and Z as both generations showed positive attitudes towards hybrid work challenges, and these variables about the research variables used in this study: resilience, values, and attitudes [31].

As expected, generations differ in their coping mechanisms [5, 33, 34]. Baby Boomers may turn to hobbies and close relationships, while younger generations often rely on mindfulness practices, self-care routines, and digital mental health tools to manage Depression. Younger generations can benefit from their elders' wisdom and life experience, while older generations can learn from the proactive mental health approaches of the youth. Mental health policies should consider generational differences in resilience. Promoting mental health awareness across generations, increasing access to digital mental health resources, and fostering cross-generational support networks can strengthen resilience.

4. Stigma and awareness among and within generations

One significant aspect that influences the perception of mental health is the stigma attached to it. Stigma refers to the prejudice and discrimination that individuals with mental illnesses face, often leading to a lack of understanding and support. Historically, it has been defined as a process by which individuals can develop stereotypical and internalized characteristics and fears about being treated differently or ostracized by others [35, 36]. Public stigma is defined as negative beliefs and stereotypes that evolve into prejudice and discriminatory behaviors towards specific groups of focus or individuals outside the accepted range of norms [35]. The public's stigma towards mental health can be a barrier to awareness and reduce engagement and adherence to care. This behavior can also exacerbate anxiety and Depression in an already vulnerable population [35–38].

The stigmatization of mental health a topic that spans international waters and afflicts millions of individuals. Although research, awareness, and resources have grown considerably over the last number of years to reduce stigma around mental health, considerable stigmatization continues to act as a barrier to seeking help and access to care [3, 7, 13, 17, 35–38]. The Boomer generation, for example, grew up during a time when mental health was heavily stigmatized. War veterans suffering from PTSD were often sent to asylums, and those with postpartum Depression were viewed as weak and isolated. Access to mental health resources was limited, and societal attitudes towards mental illness were largely negative. Generation X, often called the "lost generation," grew up with limited mental health education and support. They were raised by Baby Boomers who prioritized work and self-reliance, resulting in a lack of emotional support and understanding, the strict love approach of the previous generation clashed with the mental health challenges faced by Generation X.

Given the openness of younger generations to discuss mental health and seek resources, it is unsurprising that Generation Z and Millennials appear less likely to demonstrate individual or public stigma towards mental health [6]. However, access and awareness are sometimes inhibited by cultural limitations and intergenerational communication about mental health. Recent analysis through the APA Stress in America Report highlighted that Generation Z is more stressed than adults in other generations, given various socioeconomic stressors, the impact of climate change on their future, and various challenges due to COVID-19. However, Generation Zs were likelier to report and highlight their mental health challenges than millennials and

Generation X individuals. Finally, Generation Z and millennials were more likely to access treatment than Baby Boomers and Generation X [39].

It is crucial to promote education, awareness, and understanding across all generations to combat the stigma surrounding mental health. Removing the stigma associated with seeking help for mental health issues is vital in ensuring individuals feel comfortable accessing the support they need. Efforts should be made to embrace integrated "whole person" care, expand access to behavioral health services, and incentivize doctors to provide comprehensive care that addresses mental and physical health. Efforts must continue to bridge the gap between generations and ensure that mental health is treated equally as physical health. Additionally, destigmatizing mental health conditions through open conversations, community support, and access to resources can provide a more supportive environment for those struggling with mental illness, regardless of age.

5. The impact of the pandemic on feelings of hopelessness and loneliness within and across generations

Generations' attitudes towards uncertainty and change are influenced by their life experiences. While older generations may approach change cautiously, younger generations might view uncertainty as an opportunity for growth. These attitudes shape their coping mechanisms and resilience.

The COVID-19 pandemic brought challenges reshaping the social, economic, and psychological landscapes for people of all ages. The disruptions caused by the pandemic, such as lockdowns, social distancing measures, and work or learning arrangements, affected everyone. As a result, a sense of isolation became a shared experience. Uncertainties about the future gave rise to hopelessness, while reduced physical interactions intensified feelings of loneliness. These emotions were not limited to any generation and highlighted the universal human response to significant changes.

Each generation faced its set of challenges during this time [8, 22, 24, 40]. Older generations encountered heightened health risks, leading them to prioritize their well-being by adopting isolation practices. Limited familiarity with technology and restricted access may have amplified their loneliness due to reduced in-person interactions. Concerns about health and financial stability added another layer to this generation's risk of feeling lonely and hopeless. Generation X had to navigate through the juggling act of managing work responsibilities while also accommodating homeschooling demands and caring for aging parents. Their challenges were compounded by career uncertainties and the need to adapt to platforms. Such stressors could contribute to hopelessness stemming from difficulties balancing responsibilities. Millennials faced job losses, reduced income levels, and financial instability during this period. They grappled with these hardships as they tried to navigate through times. The daily challenges of working from home managing childcare and household responsibilities made many people feel lonelier and more hopeless—the delay or cancelation of life events, like weddings and homeownership, added to their burden. Generation Z had to deal with education, isolation from friends, and the challenges of transitioning to learning. Their limited experience with crises intensified their uncertainty and hopelessness about the future. While virtual interactions become more common, they might still need to satisfy Generation Z's need for connections fully [8, 22, 24, 40].

Different generations developed unique strategies to cope with these challenges [41]. Building connections with family, friends, and community played a crucial role in combating loneliness and hopelessness. However, technological access and familiarity significantly influenced how different generations coped, as each generation adapted differently to technology. Younger generations turned to social media platforms for connection and found solace in outlets; however, physical distancing measures reduced face-to-face social support. Older generations, who often rely on established networks for support, experienced increased isolation due to health concerns and less familiarity with technology. While younger people are skilled at using platforms for interactions, older individuals may have found adapting challenging. Furthermore, the impact of exhaustion and the quality of connections influenced how different generations cope with these circumstances.

Additionally, it is essential to acknowledge that the economic consequences of the pandemic have varied among age groups [42–44]. Younger generations have had to deal with job security and financial stability uncertainties [22, 32]. On the other hand, older generations have faced disruptions in their retirement plans and savings. These economic stressors have intensified feelings of hopelessness, magnifying their effects. Older generations, like Baby Boomers and the Silent Generation, confronted increased health risks, which led to concerns about retirement savings and medical expenses. Reduced investment values and low interest rates put a strain on fixed-income sources. Additionally, challenges in re-entering the job market compounded their vulnerabilities. During the pandemic, Generation X was trying to navigate mid-career stages, making them vulnerable to job losses or reduced income due to related cutbacks. Many of them supported their children and aging parents simultaneously, resulting in heightened pressures. These economic challenges could delay retirement plans for this generation. The pandemic further exacerbated existing struggles for Millennials, who entered the workforce during the 2008 recession. This generation is further burdened with student loan debts, job instability, and high housing costs while also dealing with a downturn. The potential long-term consequences for homeownership and financial stability are an additional concern. Generation Z, who are just starting their careers, face the challenge of building professional lives amidst an ongoing recession. The availability of internships, entry-level positions, and job opportunities has been severely affected. These early experiences with uncertainties may shape their attitudes and behaviors in the future. While government stimulus packages and support programs have played a role in mitigating the impact, their accessibility and effectiveness vary across different generations. Older individuals may have benefited from pension schemes, while younger generations relied on unemployment benefits and pandemic relief measures. These outcome disparities could have enduring implications for wealth accumulation, retirement planning, and intergenerational financial transfers [32, 41, 43–45]. The pandemic's influence on paths and career trajectories has the potential to shape prospects for many years ahead.

Generational perspectives on dealing with adversity also played a role in determining their resilience level [9, 13, 29–31, 40]. Older generations who have lived through crises such as recessions and wars often demonstrate resilience rooted in historical context. Their reliance on established support networks, traditional coping mechanisms, and an attitude of "this too shall pass" contribute to their ability to endure challenges. Generation X draws from their experience with advancements and societal changes when facing adversity. Millennials, often called the "crisis generation," have encountered disruptions over time. Their use of technology for connectivity and activism has fostered a sense of community and advocacy. They prioritize their

well-being by seeking health support and engaging in discussions about the difficulties they face. On the other hand, Generation Z, characterized by their upbringing, can effectively utilize their proficiency in virtual communication for social interaction and education purposes. Their adaptability and creativity may pave the way for methods of connecting and learning despite limitations, showcasing their resilience and resourcefulness.

Within generations, variations in circumstances led to divergent emotional responses. Socioeconomic status, living arrangements, access to technology, and pre-existing mental health conditions are just a few factors influencing individuals' experiences of hopelessness and loneliness. These disparities underscore the importance of considering individual contexts within each generation [42].

The prolonged duration of the pandemic's impact has the potential to leave lasting scars on mental well-being and necessitates long-term mental health interventions. These should be tailored to generational needs, considering differences in technology access, communication preferences, and coping mechanisms. Identifying vulnerable groups and promoting accessible mental health resources is crucial. Addressing hopelessness and loneliness requires intergenerational understanding and acknowledgment of individual variation within each generation. Effective interventions should cater to the unique needs of each generation while acknowledging the shared experiences that bind them.

The COVID-19 pandemic has cast a wide-reaching shadow over the emotional landscape, intensifying hopelessness, and loneliness. While these emotions cross generational boundaries, how each generation experienced and coped with them varied. By understanding these dynamics, policymakers, mental health professionals, and society at large can better address the mental health fallout of the pandemic and foster resilience across and within generations.

6. The role of technology, smartphones, and social media in depression across and within generations

In the 21st century, technology has become an integral part of our daily lives, influencing how we communicate, work, and even perceive ourselves. It has ushered in an era of unprecedented information dissemination. Different generations exhibit varying levels of familiarity and comfort with technology. Baby Boomers and Silent Generation individuals might use technology for functional purposes but may not fully engage with social media. Generation X may adopt technology for professional purposes, while Millennials and Generation Z have deeply integrated smartphones and social media into their lifestyle [3, 16, 20, 21, 45].

One area where its impact has been particularly profound is mental health. Online resources, websites, and social media platforms have allowed individuals of all ages to educate themselves about mental health. This enhanced awareness contributes to breaking down the stigma surrounding mental health, encouraging more open conversations, and increasing the likelihood of seeking help. The advent of teletherapy and online support groups has revolutionized mental health care [46, 47]. Particularly for tech-savvy younger generations, these digital platforms offer accessible and convenient ways to connect with mental health professionals and peers, transcending geographical barriers. This has the potential to bridge the treatment gap and provide timely interventions [46]. Smartphone apps and web-based tools designed to address Depression have proliferated recently. These digital interventions often offer features

like mood tracking, mindfulness exercises, and cognitive behavioral techniques. While not a substitute for professional therapy, they are supplementary tools to manage symptoms and encourage self-care [48].

However, while technology facilitates connecting with friends and interests, especially the younger generations (often called "digital natives"), it can also exacerbate depressive tendencies [49–52]. While social media connects individuals across distances, it can also lead to superficial interactions. Older generations may find it harder to establish meaningful connections in the digital realm, potentially contributing to feelings of isolation. Younger generations' extensive use of social media can paradoxically lead to digital loneliness, with superficial connections replacing real-life interactions. Notably, the constant exposure to curated lives on social media can exacerbate feelings of inadequacy, isolation, and low self-esteem [49, 51]. Moreover, the pressure to cultivate an appealing digital identity can fuel anxiety and self-doubt. Younger generations experience the pressure to measure up to idealized standards set by their peers' online personas, potentially contributing to feelings of Depression [53, 54]. Older individuals, often digital immigrants, face a different set of challenges. Technology can facilitate connection by enabling them to stay in touch with loved ones or contribute to isolation if they struggle to adapt to new platforms. The middle generations (Gen X and Older Millennials) straddle the divide between "natives" and "immigrants." They are adept at using technology for various tasks but also comprehend the value of face-to-face interactions. Balancing the benefits of technology's connectivity with the need for authentic human engagement is a defining challenge for this group.

Generational attitudes towards technology also influence how they consume information [16, 20, 21]. The rapid pace of technological change can also be overwhelming, potentially heightening stress and anxiety. Older generations may be overwhelmed by the constant influx of news and information, leading to stress and anxiety. Younger generations, accustomed to information overload, might still grapple with managing the emotional toll of negative news and online conflicts. While social media can help them connect with peers, it can also contribute to feelings of inadequacy, comparison, and cyberbullying, potentially exacerbating depressive symptoms [54]. Notably, the constant exposure to peers' curated online lives can lead to Fear of Missing Out (FOMO) and a sense of social isolation, both of which are associated with higher rates of Depression [53].

Within each generation, diverse attitudes towards technology exist. Socioeconomic factors, individual digital engagement, and personality traits influence how technology affects mental health. Those with limited access to technology or who choose to disconnect might experience reduced exposure to its adverse impacts.

In conclusion, technology's role in Depression is multifaceted and varies across different age groups. It can enhance awareness, provide access to support care, and offer digital interventions. However, it can also contribute to social comparison, isolation, information overload, and feelings of inadequacy, particularly among younger generations heavily engaged in social media. For all generations, finding a healthy balance in the use of technology, seeking professional help when needed, and fostering real-world connections remain crucial for maintaining good mental health. Recognizing the nuanced role of technology and cultivating a balanced approach to its use is essential in promoting mental well-being across all age groups. As society continues to navigate the digital landscape, it is imperative to harness technology's potential for positive change while safeguarding against its potential negative consequences.

7. Conclusion

Depression is a pervasive mental health condition that transcends generational boundaries, yet its manifestations, experiences, and responses are influenced by many factors across and within generations. This essay delved into the intricate inter and intra-generational dynamics of Depression, focusing on critical aspects such as stigma, resilience, awareness, the pandemic's influence on hopelessness and loneliness, and the role of technology in shaping these complexities.

The stigma surrounding Depression has evolved. Historically, mental health issues were shrouded in silence and shame. Across generations, strides have been made in erasing the stigma, driven by increased awareness campaigns and open conversations. However, while benefiting from more excellent dialog, younger generations face new challenges due to social media's amplification of judgment and the pressure for constant positivity. Digital natives often grapple with disclosing their mental health struggles online, fearing the potential ramifications on their personal and professional lives. Resilience, the ability to bounce back from adversity, varies within and between generations. Older generations might have developed resilience through life experiences and social support networks. In contrast, younger generations, though equipped with information and resources, might lack the emotional resilience to navigate the rapid changes brought about by the digital age. The pressure to succeed and the constant comparison facilitated by technology can strain their ability to cope effectively. Awareness of Depression's signs and treatment options has grown across generations due to increased mental health advocacy. However, despite this awareness, suicide rates remain a grave concern. Younger generations, particularly adolescents and young adults grapple with higher rates of suicide due to factors like cyberbullying, academic pressures, and social media's influence on self-esteem. The transition from awareness to effective prevention strategies remains a challenge. The COVID-19 pandemic has exacerbated hopelessness and loneliness, impacting all generations. Social distancing measures have reduced in-person interactions, heightening feelings of isolation. Older generations, who might be more vulnerable to severe health risks, face increased isolation due to safety precautions. Younger generations, already accustomed to virtual connections, struggle with the absence of physical interactions and the disruption of pivotal life milestones. Technology's role in Depression is both a blessing and a curse. Digital platforms enable awareness campaigns, mental health resources, and teletherapy, benefiting individuals of all ages. However, technology's excessive use can foster social isolation, exacerbate feelings of inadequacy, and intensify the fear of missing out, particularly among younger generations. Balancing the positive aspects of technology with its potential adverse effects is crucial for promoting mental well-being.

Depression's intricacies manifest differently across and within generations, shaped by several factors. As societies evolve, fostering intergenerational dialog that acknowledges these differences and promotes understanding and empathy is imperative. Combating Depression requires collaborative efforts, including sustained awareness campaigns, targeted prevention strategies, and responsible technology use. By recognizing each generation's unique challenges, we can collectively work towards a future where Depression is met with compassion, support, and effective interventions.

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Chapter 2

Perspective Chapter: Psycho-Cybernetics in Depression – Harnessing the Power of the Mind

Swayam Prava Baral, Gyanendra Raghuvanshi and Amrit Pattojoshi

Abstract

Psycho-cybernetics offers valuable insights for individuals dealing with depression. By understanding the power of self-image and beliefs, individuals can begin to address the negative thinking patterns that contribute to their depressive symptoms. The concept of the vicious cycle in depression, where negative thoughts reinforce negative emotions, can be interrupted by utilizing cognitive reframing techniques. Through cognitive reframing, individuals can challenge and replace negative beliefs with more positive and realistic ones, breaking the self-fulfilling prophecy of depression. Mental rehearsal and visualization techniques can help individuals reshape their self-image and cultivate a more positive outlook. However, it's important to note that psycho-cybernetics should not replace professional help. Seeking therapy and support from mental health professionals is essential for comprehensive and effective treatment of depression. By integrating psycho-cybernetics principles with evidence-based therapies, individuals can empower themselves to reframe their thinking patterns, cultivate a positive self-image, and work toward improved mental well-being.

Keywords: self-image, beliefs, vicious cycle, cognitive reframing, mental rehearsal

1. Introduction

Depression is a complex and pervasive mental health condition that affects millions of people worldwide. Its impact can be debilitating, leading to feelings of sadness, hopelessness, and a loss of interest in daily activities. While traditional approaches to treating depression often involve medication and therapy, there is growing recognition of the role that psycho-cybernetics can play in alleviating depressive symptoms [1]. In this chapter, we will explore the principles of psycho-cybernetics and examine how they can be applied to empower individuals suffering from depression to take control of their thoughts, emotions, and ultimately their lives.

2. Understanding psycho-cybernetics

Psycho-cybernetics, a term coined by Dr. Maxwell Maltz, refers to the study of how the mind and self-image interact to shape our perception of the world and influence our behaviors [1]. It is based on the principle that our minds operate like a cybernetic system, constantly seeking feedback and making adjustments to achieve desired outcomes [2]. The foundation of psycho-cybernetics lies in the understanding that our thoughts, beliefs, and self-perception are deeply intertwined and have a profound impact on our emotional well-being [1].

Psycho-cybernetics is a self-help book written by Maxwell Maltz, a plastic surgeon, and published in 1960. It explores the relationship between the mind and the body, and how our self-image and beliefs influence our actions and outcomes in life [1].

The term "cybernetics" refers to the study of control systems and feedback mechanisms. In the context of psycho-cybernetics, it relates to how our mind functions as a goal-seeking mechanism, similar to the way a machine with a feedback loop operates. Maltz believed that by understanding and harnessing the power of our mind, we can effectively steer our lives toward our desired goals [3].

Here are a few key principles and concepts from Psycho-cybernetics:

2.1 Self-image

According to Maltz, our actions and outcomes are strongly influenced by our self-image—the mental picture we hold of ourselves. Our behavior tends to align with our self-image, so if we see ourselves as capable and confident, we are more likely to exhibit those qualities.

2.2 Success mechanism

Maltz proposes that our minds have a built-in success mechanism, which works like a cybernetic feedback system. When we set a goal, our mind automatically works toward achieving it by providing feedback and making adjustments along the way. By programming our mind with positive, specific goals, we can activate and utilize this success mechanism more effectively.

2.3 Creative imagination

Maltz emphasizes the power of creative imagination. By vividly visualizing ourselves achieving our goals, we can stimulate our subconscious mind and align it with our conscious desires. This visualization technique can help improve our self-image and increase our chances of success.

2.4 Self-fulfilling prophecy

Maltz suggests that our beliefs about ourselves often become self-fulfilling prophecies. If we hold negative beliefs about our abilities or worth, we are more likely to act in ways that validate those beliefs. Conversely, positive beliefs can lead to positive outcomes.

2.5 Mental rehearsal

The book advocates for the use of mental rehearsal, where we mentally practice desired actions and outcomes. By mentally rehearsing successful scenarios, we can enhance our skills, build confidence, and improve performance in real-life situations.

Overall, psycho-cybernetics explores the power of self-perception, visualization, and mental programming to achieve personal growth, success, and fulfillment. It suggests that by understanding and utilizing the principles of cybernetics and our own self-image, we can shape our lives in more positive and productive ways.

3. The vicious cycle of depression

Depression often traps individuals in a vicious cycle of negative thoughts, self-doubt, and emotional distress. This cycle perpetuates feelings of hopelessness and further reinforces negative self-perception. Psycho-cybernetics aims to break this cycle by helping individuals recognize and change their negative self-image, beliefs, and thought patterns [4].

In the context of psycho-cybernetics, the concept of the "vicious cycle" can be applied to understand depression. Depression is a complex mental health condition characterized by persistent feelings of sadness, loss of interest or pleasure in activities, changes in appetite and sleep patterns, fatigue, and negative thoughts.

The vicious cycle of depression refers to a self-perpetuating pattern of negative thoughts, emotions, and behaviors that can worsen and prolong depressive symptoms. Here's how it relates to psycho-cybernetics:

3.1 Self-image and negative beliefs

People experiencing depression often have a negative self-image and hold negative beliefs about themselves, such as feeling unworthy, helpless, or hopeless. These negative beliefs contribute to a distorted perception of themselves and the world around them.

3.2 Feedback loop

In psycho-cybernetics, it is emphasized that our mind functions as a goal-seeking mechanism with a feedback loop. In the case of depression, the feedback loop operates in a negative manner. Negative thoughts and beliefs about oneself create negative emotions, which further reinforce negative thoughts, creating a continuous loop.

3.3 Self-fulfilling prophecy

The negative beliefs held by individuals with depression often become self-fulfilling prophecies. These beliefs shape their behavior and interactions with the world. For example, if someone believes they are worthless, they may withdraw from social activities, neglect self-care, or give up on pursuing goals, which can lead to further isolation and reinforce their negative beliefs.

3.4 Reinforcement of negative thoughts

The constant bombardment of negative thoughts and emotions can reinforce the negative self-image and perpetuate the cycle of depression. These negative thoughts create a filter through which individuals perceive themselves and their experiences, leading to a biased interpretation of events that reinforces their negative beliefs.

3.5 Mental rehearsal and visualization

Psycho-cybernetics suggests that the power of mental rehearsal and visualization can be used to reshape self-image and overcome negative patterns. In the case of depression, individuals can utilize visualization techniques to imagine positive scenarios, challenge negative beliefs, and create a more positive self-image. This can help interrupt the vicious cycle and promote more constructive thoughts and behaviors.

While psycho-cybernetics provides insights into the dynamics of the vicious cycle of depression, it is important to note that depression is a complex mental health condition that often requires professional help. Psychotherapy, medication, and support from mental health professionals are commonly used to address depression effectively.

4. Reconstructing self-image

One of the key components of psycho-cybernetics in treating depression is reconstructing self-image. People with depression often hold distorted and negative views of themselves, which contribute to their emotional suffering. Through the principles of psycho-cybernetics, individuals can learn to challenge and replace these negative self-images with positive and empowering ones. Techniques such as visualization, affirmations, and cognitive reframing can be employed to facilitate this process.

In psycho-cybernetics, the concept of reconstructing self-image can be applied to depression as a means of breaking free from the negative cycle and promoting healing and well-being. Here's how psycho-cybernetics can be utilized in the context of depression to reconstruct self-image:

4.1 Awareness and recognition

The first step is to become aware of the negative self-image and beliefs that contribute to depression. Recognize the patterns of negative thinking, self-criticism, and self-doubt that are part of the depressive cycle. This awareness allows you to consciously intervene and start the process of reconstructing self-image.

4.2 Cognitive restructuring

Challenge and reframe negative thoughts and beliefs. Begin by questioning the validity of negative self-perceptions and replacing them with more positive and realistic affirmations. Identify evidence that contradicts the negative beliefs and focus on building a more balanced and compassionate self-view.

4.3 Visualization and mental rehearsal

Utilize the power of creative imagination to visualize a positive self-image. Imagine yourself engaging in activities that bring joy and fulfillment, interacting confidently with others, and achieving personal goals. Engage in mental rehearsals where you practice positive behaviors and responses in various situations.

4.4 Positive affirmations and self-talk

Use positive affirmations and self-talk to reinforce a healthier self-image. Repeat positive statements about yourself regularly, such as "I am worthy," "I am capable," and "I deserve happiness." Over time, these affirmations can help rewire your thinking patterns and reinforce positive self-perception.

4.5 Gradual exposure and behavioral activation

Gradually engage in activities and situations that align with your desired self-image, even if they initially feel challenging. Start small and build momentum, gradually increasing your involvement in activities that bring you joy and a sense of accomplishment. This process, known as behavioral activation, can help reinforce a positive self-image through real-life experiences.

4.6 Seek support

Consider seeking support from a mental health professional, such as a therapist or counselor, who can provide guidance and tools for reconstructing self-image in the context of depression. They can offer specialized techniques and therapies, such as cognitive-behavioral therapy (CBT), that focus on challenging negative beliefs and promoting positive change.

Remember, the process of reconstructing self-image takes time and patience. Be compassionate with yourself and celebrate small victories along the way. It's important to combine the principles of psycho-cybernetics with professional help when dealing with depression, as therapists can provide personalized strategies and support tailored to your specific needs.

5. Visualizing a positive future

Visualization is a powerful tool used in psycho-cybernetics to create a compelling mental image of a positive future [3]. By vividly imagining oneself as happy, fulfilled, and free from depressive symptoms, individuals can begin to reprogram their subconscious mind [5]. Regular practice of visualization exercises can help shift the focus from despair to hope and provide a sense of direction, motivating individuals to take action toward their desired outcomes.

In the context of depression, psycho-cybernetics emphasizes the power of visualization and mental programming to help individuals create a more positive future outlook. Here are some ways in which psycho-cybernetics can be applied to depression:

5.1 Creative imagination

Creative imagination involves vividly visualizing positive outcomes and experiences. In the case of depression, individuals can use this technique to imagine themselves feeling happier, engaging in enjoyable activities, and achieving their goals. By regularly engaging in positive visualization, individuals can reprogram their subconscious mind and create a more positive self-image.

5.2 Mental rehearsal

Mental rehearsal involves mentally practicing desired behaviors, actions, and reactions. In the context of depression, individuals can mentally rehearse engaging in activities that bring them joy, interacting with others in a positive way, and responding to challenges more effectively. This technique helps rewire the brain and strengthen neural pathways associated with positive experiences and behaviors.

5.3 Goal setting

Setting specific, achievable goals is an important aspect of psycho-cybernetics. By defining clear goals, individuals with depression can focus their energy and attention on activities that bring them closer to their desired outcomes. This sense of purpose and progress can provide a sense of accomplishment and improve overall well-being.

5.4 Affirmations

Affirmations involve repeating positive statements about oneself and one's future. For individuals with depression, affirmations can help counteract negative self-talk and replace it with uplifting and empowering beliefs. Affirmations such as "I am worthy of happiness and fulfillment" or "I am capable of overcoming challenges" can be repeated regularly to reinforce positive self-perception.

5.5 Gradual exposure

Psycho-cybernetics recognizes the importance of gradually exposing oneself to new experiences and challenges. In the context of depression, individuals can start with small steps toward their goals, gradually increasing their level of engagement and involvement. This approach helps build confidence, resilience, and a sense of control over one's life.

It's important to note that while psycho-cybernetics can provide some tools and techniques to help individuals with depression, it is not a substitute for professional treatment. Depression is a serious mental health condition that may require a comprehensive approach involving therapy, medication, and support from mental health professionals. It's always advisable to consult with a qualified healthcare provider for an appropriate treatment plan.

6. Affirmations and positive self-talk

Affirmations are positive statements that are repeated regularly to reinforce new beliefs and attitudes. In the context of depression, affirmations can be used to

challenge negative self-perceptions and replace them with empowering thoughts. By consciously choosing to replace self-critical thoughts with affirmations of self-worth, individuals can gradually reshape their self-image and build resilience against depressive tendencies. Incorporating positive self-talk into daily routines can serve as a constant reminder of one's inherent value and potential [6].

In the context of depression, the principles of psycho-cybernetics can be applied to incorporate affirmations and positive self-talk as part of a comprehensive approach to managing depressive symptoms [5]. Here's how affirmations and positive self-talk can be utilized:

6.1 Affirmations for self-image

Affirmations are positive statements that you repeat to yourself, aimed at reinforcing positive beliefs and challenging negative self-perceptions. In psycho-cybernetics, the concept of self-image is crucial. By incorporating positive affirmations into your daily routine, you can gradually reprogram your self-image and foster more constructive thoughts about yourself. For example, repeating affirmations like "I am worthy of love and happiness," "I have the strength to overcome challenges," or "I am deserving of success" can help shift your mindset toward a more positive perspective. Challenging negative thoughts: Depression often involves distorted and negative thinking patterns. In psycho-cybernetics, the power of self-awareness and thought observation is emphasized. By identifying negative thoughts and actively challenging them with positive counterstatements, you can begin to reframe your thinking. For example, if you catch yourself thinking, "I'm a failure," you can consciously replace it with a positive self-talk statement like, "I have accomplished many things in the past, and I am capable of achieving my goals."

6.2 Visualization and mental rehearsal

As mentioned earlier, psycho-cybernetics highlights the effectiveness of visualization and mental rehearsal in shaping self-image and performance. When dealing with depression, you can use visualization techniques to imagine positive outcomes, visualize yourself engaging in enjoyable activities, or picture yourself overcoming challenges. This form of mental rehearsal can help you build resilience, increase motivation, and generate more positive emotions.

6.3 Consistency and repetition

Incorporating affirmations and positive self-talk into your daily routine requires consistency and repetition. Just like any habit, the more you practice it, the more it becomes ingrained in your mindset. Consider setting aside specific times during the day, such as morning or before bed, to repeat affirmations and engage in positive self-talk. Consistency over time can lead to noticeable changes in your self-perception and overall mood.

While affirmations and positive self-talk can be helpful tools, it's essential to remember that depression is a complex condition that often requires professional help. Psychotherapy, medication, and support from mental health professionals play a vital role in managing depression effectively. Incorporating affirmations and positive self-talk can be complementary strategies to support your overall mental well-being, but they should not be considered as standalone treatments for depression.

7. Cognitive reframing

Cognitive reframing involves identifying and replacing negative thought patterns with more positive and realistic ones. People with depression often engage in distorted thinking, such as magnifying negative events and minimizing positive experiences. Through cognitive reframing, individuals can learn to recognize these cognitive distortions and reframe their thoughts in a more balanced and rational manner. This process allows for a shift in perspective and encourages the development of more constructive and adaptive thinking patterns [6].

Cognitive reframing, a technique commonly used in cognitive-behavioral therapy (CBT), can be aligned with the principles of psycho-cybernetics to help individuals with depression reshape their thinking patterns and overcome negative beliefs [7]. Here's how cognitive reframing relates to psycho-cybernetics in the context of depression:

7.1 Self-image and beliefs

Psycho-cybernetics emphasizes the role of self-image and beliefs in shaping our thoughts, emotions, and behaviors. In the case of depression, individuals often hold negative beliefs about themselves, their abilities, and their worth. Cognitive reframing aims to identify and challenge these negative beliefs, replacing them with more positive and realistic ones.

7.2 Feedback loop

Both psycho-cybernetics and cognitive reframing recognize the presence of a feedback loop in our thinking patterns. Negative beliefs and thoughts contribute to negative emotions, which further reinforce negative thinking, creating a vicious cycle. By using cognitive reframing techniques, individuals can interrupt this cycle by introducing more positive and adaptive thoughts that lead to improved emotions and behaviors.

7.3 Self-fulfilling prophecy

Psycho-cybernetics highlights how our beliefs can become self-fulfilling prophecies. Similarly, cognitive reframing addresses the impact of negative self-talk and self-fulfilling prophecies on depressive symptoms. By reframing negative thoughts and beliefs, individuals can break free from the self-fulfilling cycle and create new, positive outcomes.

7.4 Mental rehearsal and visualization

Psycho-cybernetics suggests the use of mental rehearsal and visualization to reshape self-image and improve outcomes. Cognitive reframing can incorporate similar techniques by encouraging individuals to visualize positive scenarios and practice mentally replacing negative thoughts with more positive alternatives. This helps individuals develop a new narrative and reinforces positive self-beliefs.

7.5 Automatic thought patterns

Cognitive reframing focuses on identifying and challenging automatic thought patterns that contribute to depressive symptoms. By recognizing negative thinking

patterns and replacing them with more balanced and realistic thoughts, individuals can change their perception of themselves, their experiences, and the world around them. This process aligns with the goal of shaping a positive self-image in psycho-cybernetics.

By combining the principles of psycho-cybernetics with cognitive reframing techniques, individuals with depression can gain a deeper understanding of their thought processes and develop strategies to reframe negative thinking. However, it's important to note that addressing depression typically requires a comprehensive approach involving therapy, medication (if necessary), and support from mental health professionals.

8. Limitations

Not much recent scientific papers are available that can support the validity of the proposed model.

9. Conclusion

Depression can be a debilitating condition that profoundly impacts a person's well-being and quality of life. While traditional treatment approaches are essential, integrating the principles of psycho-cybernetics can offer individuals an additional toolset to combat depression.

In conclusion, the application of psycho-cybernetics in the context of depression offers valuable insights and strategies for individuals seeking to overcome negative thinking patterns and improve their mental well-being. While psycho-cybernetics primarily focuses on self-image and the power of the mind in achieving goals, its principles can be adapted to address the challenges of depression. By incorporating cognitive reframing techniques, individuals can work toward reshaping their beliefs, interrupting negative feedback loops, and cultivating a more positive self-image.

Psycho-cybernetics highlights the self-fulfilling nature of beliefs and the importance of mental rehearsal and visualization. By challenging negative beliefs and practicing positive self-talk, individuals can break free from the vicious cycle of depression and create new, constructive patterns of thinking and behavior. The principles of goal-seeking mechanisms and feedback loops offer a framework for understanding how individuals can utilize their minds to steer their lives toward positive outcomes and improved mental health.

However, it is crucial to recognize that depression is a complex mental health condition that often requires professional intervention. Psycho-cybernetics can be a helpful adjunct to therapy, but it is not a substitute for evidence-based treatments. Seeking the guidance of mental health professionals, such as therapists or psychiatrists, is essential for comprehensive and personalized support.

By combining the principles of psycho-cybernetics with evidence-based therapies, individuals with depression can empower themselves to challenge negative thinking patterns, develop a more positive self-image, and work toward a healthier and more fulfilling life.

10. Case study: using psycho-cybernetics diagnostically for depressed patients

Patient Background:

Name: Sarah Age: 32 Occupation: Marketing Manager.

Chief Complaint: Persistent feelings of sadness, low energy, loss of interest in activities, difficulty concentrating, and changes in sleep and appetite patterns.

Diagnosis: Major depressive disorder.

Initial Assessment:

Sarah's initial assessment reveals symptoms consistent with major depressive disorder. She expresses feelings of hopelessness and helplessness, struggles to find enjoyment in activities she once enjoyed, and has experienced a significant decline in her work performance. She reports difficulties in maintaining relationships due to her low energy and persistent negative thoughts.

Utilizing psycho-cybernetics diagnostically:

Psycho-cybernetics is a self-help psychological technique that emphasizes the role of self-image and the subconscious mind in shaping behavior and emotions. It can be used diagnostically in conjunction with traditional methods to gain deeper insights into the patient's thought patterns, self-perception, and potential contributing factors to their depression.

Step 1: Self-image assessment.

Incorporating psycho-cybernetics, the therapist guides Sarah through an assessment of her self-image. This involves identifying her self-perceived strengths, weaknesses, and any negative beliefs she holds about herself. Through introspection and guided questioning, Sarah realizes that she has developed a negative self-image due to a series of work-related failures and personal setbacks.

Step 2: Visualization techniques.

The therapist introduces Sarah to visualization techniques commonly used in psycho-cybernetics. Sarah is encouraged to vividly imagine herself in scenarios where she is successful, confident, and content. These visualizations help her challenge her negative self-image and replace it with positive mental imagery.

Step 3: Affirmations and self-talk.

Sarah is taught how to use positive affirmations and constructive self-talk. She is encouraged to replace self-critical thoughts with affirmations that promote self-acceptance, resilience, and optimism. The therapist helps her create a list of personalized affirmations to use daily.

Step 4: Goal setting and reinforcement.

Psycho-cybernetics emphasizes setting clear goals to guide one's behavior and actions. The therapist works with Sarah to set achievable short-term goals related to her work, social interactions, and personal interests. These goals help Sarah regain a sense of purpose and accomplishment, positively impacting her self-image.

Step 5: Monitoring progress and adjustments.

Regular assessments are conducted to monitor Sarah's progress. Using psycho-cybernetics principles, the therapist helps Sarah recognize any relapses into negative self-image and offers strategies to readjust her self-perception. By continuously reinforcing positive self-image and using visualization and affirmation techniques, Sarah learns to manage her depressive symptoms more effectively.

Outcome:

Over a period of several months, Sarah shows significant improvement in her depressive symptoms. Her energy levels increase, she becomes more engaged in her

work, and her relationships improve. While psycho-cybernetics is used as an adjunct to traditional therapeutic approaches, its emphasis on self-image, visualization, and positive reinforcement complements Sarah's journey toward recovery.

11. Case study: applying psycho-cybernetics therapeutically for depressed patients

Patient Information: Name: Sarah Age: 32 Gender: Female Diagnosis: Major Depressive Disorder.

Background: Sarah is a 28-year-old woman who has been experiencing symptoms of depression for the past year. She reports feelings of sadness, hopelessness, low energy, and a lack of interest in activities she once enjoyed. These symptoms have significantly impacted her daily functioning, including her job performance and relationships with friends and family.

Therapeutic Approach: The therapist decides to incorporate principles from psycho-cybernetics, a self-help and self-improvement concept, into Sarah's treatment plan. Psycho-cybernetics emphasizes the relationship between the mind and the self-image, suggesting that improving one's self-perception can lead to positive changes in behavior, emotions, and overall well-being.

Session 1: Assessment and goal setting.

The therapist conducts an initial assessment to understand Sarah's self-image and how it may be contributing to her depression. Sarah expresses feelings of inadequacy, low self-esteem, and a negative self-image. Together, they set therapeutic goals: to improve her self-perception, increase self-esteem, and cultivate a positive outlook on life.

Session 2: Self-image exploration.

The therapist guides Sarah through exercises to explore her self-image. They discuss her past achievements, strengths, and positive qualities. Sarah is encouraged to create a list of affirmations that challenge her negative self-perceptions and reinforce her positive attributes. The therapist introduces the concept of a "success mechanism," explaining how the mind can be programmed to work toward achieving positive goals.

Session 3: Visualization and mental rehearsal.

Sarah learns visualization techniques to imagine her life with improved self-esteem and reduced depressive symptoms. The therapist guides her through a mental rehearsal where she envisions herself engaging in activities she enjoys and interacting confidently with others. This exercise helps activate her brain's reticular activating system (RAS) to notice positive experiences and opportunities in real-life.

Session 4: Self-image modification.

The therapist introduces self-hypnosis as a tool to modify Sarah's self-image. Sarah learned how to enter a relaxed state and repeat positive affirmations about herself. This practice helps reprogram her subconscious mind to embrace a healthier self-concept.

Session 5: Behavioral activation.

Building on her improved self-image, Sarah and the therapist collaboratively developed a plan for behavioral activation. Sarah gradually starts engaging in activities she once enjoyed, even if she does not initially feel like doing them. The therapist emphasizes that taking action can positively influence her emotions and self-perception.

Session 6: Progress review and future plans.

Sarah's depressive symptoms have significantly improved. She reports feeling more confident, experiencing fewer negative thoughts, and finding more joy in her daily life. The therapist and Sarah review her progress, celebrate her achievements, and discuss strategies for maintaining her newfound positive self-image.

Follow-up: Sarah continues practicing the techniques she learned in therapy, including visualization, self-hypnosis, and positive affirmations. Over time, she experiences a reduction in depressive symptoms and an increase in overall well-being. She maintains regular check-ins with her therapist to monitor her progress and address any challenges that arise.

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Chapter 3

Perspective Chapter: Trauma and Depression – An Overview about Comorbidity

Federico Durbano, Barbara Marchesi and Floriana Irtelli

Abstract

There are various types of trauma, some of which can cause post-traumatic stress disorder (PTSD): they are those involving death, or the threat of death, or serious injury, or the threat to the physical integrity of oneself or others. PTSD often appears associated with other disorders such as depression anxiety disorders and dissociation, and trauma can also increase the possibility that depression and anxiety become autonomous. However, it has long been observed that depression is the disorder that occurs most frequently associated with PTSD. This theme was also explored for the age groups under 18. The need to take into account the complexity of post-traumatic stress disorder and possible comorbidity was then underlined, therefore the use of multiple diagnoses is a valuable element. The diagnosis of PTSD, like that of depression, is a complex diagnosis, articulated on multiple phenomenological levels and it is therefore important in the diagnosis to have clear knowledge of the syndromic grouping of these disorders. The topic of psychodiagnostics was therefore introduced in this area. Finally, the therapeutic objectives common to the various orientations in the treatment of traumatized adults were exposed, and it was specified that the future of research in the field of pharmacotherapy and psychotherapy can no longer be represented by a sterile struggle for its affirmation but turns toward the study the best integration of the two approaches.

Keywords: trauma, PTSD, depression, pharmacotherapy, psychotherapy

1. Introduction

Already in 1994 Terr [1] distinguished between traumas of the "first type," that is, those due to a single traumatic experience, and traumas of the "second type," that is, those that occur several times over time, which can be, for example, abuse and mistreatment.

We must remember, upstream, that there are traumas of both the "first type" and the "second type" which can cause post-traumatic stress disorder (PTSD) according to the Diagnostic Statistical Manual of Mental Disorders. Explaining what we mean by PTSD we can remember that in 1980, following observations conducted on Vietnam veterans, a new diagnostic category was inserted, namely that of PTSD [2], which was recognized as a process of adaptation to adverse conditions, and this diagnostic

category clarifies how the procession of symptoms does not depend exclusively on the vulnerability of the traumatized subject but also on the characteristics of the event. Generally, people who have dealt with severe violence or stress have reported disturbing long-term symptoms, including memory distortion, punctuated by vivid flashbacks, emotional numbness, difficulty sleeping, elevated stress, and feelings of social isolation [3], but to make a precise diagnosis of PTSD it is necessary to meet some precise diagnostic criteria and, upstream, that the subject experiences an event which involves death, or the threat of death, or serious injuries or the threat to physical integrity of oneself or others. The person's response in that situation typically includes intense fear, feelings of helplessness or horror. To diagnose PTSD, some of these symptoms must be present for more than a month for each category listed below:

- *Intrusive symptoms*: Involuntary unpleasant memories, unpleasant trauma-related dreams, dissociative reactions, such as flashbacks, psychological distress, and physiological relationships when faced with trauma-related stimuli. One or more symptoms in this category must be present.

- *Symptoms related to avoidance of trauma-related stimuli*: Avoidance or attempt to avoid unpleasant memories and thoughts related to the trauma, and avoidance or attempt to avoid external factors (people, things, places, situations) that elicit unpleasant memories related to the trauma. One or two of the two criteria listed in this category must be present.

- *Negative changes in thoughts and emotions associated with the trauma*: Inability to remember some important aspect of the trauma, persistent and exaggerated negative beliefs or expectations about oneself and the world, and/or regarding the cause and/or consequences of the trauma, persistent emotional state negative, marked reduction in interest or participation in significant activities, feelings of detachment and/or alienation toward others, persistent inability to experience positive emotions. Two or more criteria from this symptom group in this category must be present.

- *Alteration of arousal and excessive reactivity to any stimulus related to the trauma*: Irritable behavior and/or explosions of anger, reckless and/or self-destructive behavior. Two or more criteria among those listed in this category must be present [2].

As we can observe, what is now called in scientific terms post-traumatic stress disorder is represented by a constellation of symptoms, both psychological and physical, whose identification within a single clinical picture is not always easy; in fact, even if on the one hand we are facilitated in identifying PTSD as the triggering cause is generally evident, on the other hand we find ourselves faced with a very complex phenomenon, both for the variety of symptoms and the numerous biological and psychological processes involved. This disorder also often appears associated with other disorders, in fact, after exposure to a traumatic experience PTSD is not the only psychiatric condition that can develop: anxiety and depression can also arise and comorbidity is the norm rather than the exception [4]. It should be emphasized in this regard that depression has been found to be one of the most serious and prevalent conditions that occur in conjunction with PTSD [5] and it has long been observed that depression is the disorder that occurs most frequently associated with post-traumatic stress disorder [4], in fact, even from

studies carried out already in the 90s following natural and technological disasters, a clear high frequency of depressive symptoms [6].

Having observed the frequency of comorbidity, various studies were therefore carried out in the following years to determine more precisely the relationship between depression and post-traumatic stress disorder, and it was therefore observed that, if before the trauma a subject already had PTSD or episodes of depressive disorders the individual was more predisposed to developing the pathology of the two not yet experienced before, since it seems that each of the two disorders predisposes one to vulnerability to the other [4].

Scientific studies have also suggested over time that depressive symptoms are often an integral part of PTSD and that identifying depression as a distinct PTSD disorder sometimes appears to be a daunting task; however, there is also evidence to suggest that depression can also exist as a separate and independent entity [4]. In summary, after exposure to trauma, it has therefore been found that PTSD and depression can frequently manifest themselves both as separate disorders and as concomitant disorders, and we recall again that some scholars have raised the question of whether PTSD and depression are really separate disorders after trauma or whether they are part of a single overarching construct, also suggesting that when PTSD and depression co-occur they reflect a shared vulnerability with similar predictive variables [4]. Regarding the relationship between trauma and depression, it was finally found that for women who face pregnancy in adulthood, previous traumatic events represent a risk factor for later developing postpartum depression [7] and it has been noted, regarding the relationship between trauma and postpartum depression, which in particular traumatic events experienced in the military can increase the risk of postpartum depression among women veterans (who in fact are more likely to have suffered trauma during the course of military service) [8]. This leads us to consider, as mentioned previously, that both depression can make us more vulnerable to PTSD and PTSD can over time make us more vulnerable to depression because the two disorders appear to be related to each other.

2. Trauma and depression in developmental age

We must specify that although the diagnosis of PTSD, when it was first formulated in 1980, was not considered relevant for children and adolescents, Leonore's studies Terr on a group of children kidnapped and held hostage demonstrated the opposite [9, 10]. Unfortunately, it is known that adults often commonly underestimate the severity of children's reactions to trauma, that is, they may therefore not be aware of children's need to process their experience [11], but in the scientific community, it is now clear that even minors can develop PTSD (and also other disorders) following traumatic events [9–11].

The diagnosis of PTSD in children over 6 years of age and adolescents is almost isomorphic to the diagnosis for adults, whereas the diagnosis of PTSD for children under 6 years of age has its own specific criteria. Post-traumatic stress disorder in children under 6 years of age be diagnosed must fall within the following criteria: 1) exposure to actual death or threat of death, serious injury, or sexual violence in one of the following ways: directly experiencing the traumatic event, directly witnessing a trauma that happened to others, coming to knowledge of the trauma that occurred a family member or caregiver. The trauma must have occurred in one or more of the above ways. 2) presence of one or more of the following intrusive symptoms:

recurrent, involuntary, and intrusive unpleasant memories of the trauma. Recurring unpleasant dreams related to trauma. Dissociative reactions, for example, flashbacks, where the child feels or acts as if the trauma is recurring, this can happen during play. Intense or prolonged psychological distress upon exposure to internal or external triggers that symbolize or resemble some aspect of trauma. Marked physiological reactions in response to factors reminiscent of the trauma. 3) One or more of the following symptoms, representing persistent avoidance of trauma-related stimuli or negative changes in emotions and thoughts associated with the trauma: persistent avoidance of trauma-related stimuli. Negative alterations in connectivity, such as increased frequency of negative emotional states, marked decrease in interest or participation in meaningful activities, withdrawn social behavior, and persistent reduction in expression of positive emotions. 4) Alteration of reactivity associated with the trauma: irritable behavior and explosions of anger, hypervigilance, exaggerated alarm responses, concentration problems, and sleep difficulties. 5) The duration of the alterations is more than 1 month. 6) The alteration causes clinically significant clinical distress, impairment in relationships with parents, siblings, peers or others, or in school behavior [2].

We must point out that after the 90s several studies were carried out regarding PTSD in children and adolescents but most of the epidemiological studies on post-traumatic stress disorder have mostly been conducted on adolescents and older adults [11]; it has been observed that young children after a trauma show less emotional numbness and also have more problems reporting avoidance reactions, since they are not relevant or too complicated to express in words, since they require rather complex cognitive introspection and this can make it more difficult for young children to meet the DSM criterion of avoidance [11].

As we have already mentioned, following exposure to traumatic stressors, children show a wide range of stress reactions and we must specify that these vary with age and to some extent by gender. It has been noted that younger children after a trauma show more evident aggression and destructiveness and may also show more repetitive playing (and drawings) about the traumatic event, as well as behavioral reenactments. For preschool children, there is less agreement on the extent and severity of their reactions to stress, and for this age group the reactions appear more determined by the parents' reactions to the event: if the parents respond calmly the child may feel more protected and safe. Above the age of 8–10 years, children's reactions become more similar to those expressed by adults: the school-age child is better able to understand the situation, is able to see the long-term consequences to a greater extent end of the traumatic event(s) and can reflect more on their role in what happened. Gender differences often appear in the reaction of children and adolescents: more girls than boys qualify for the diagnosis of PTSD, while boys show higher rates of behavioral symptoms [12].

At the same time, there are also numerous studies regarding childhood traumas and the development of depression, highlighting in this case too a strong correlation between traumas and depression.

In this regard, several studies have been carried out on young subjects in which it has been found that the physiological disturbance immediately after exposure to trauma has proven to be a factor that can predict anxiety and depression [13], and has been observed and confirmed that childhood traumas are considered associated with the onset of depression in adulthood [14]; in this regard, it seems that there is also a specific relationship between childhood traumas and the subsequent development of depression: one study found an increase of four times of the risk of depression

in adults who had experienced multiple traumas during childhood [15] and the role of childhood trauma in the development of depression has also been confirmed in studies on twins [16], and finally it seems that individuals who have experienced early traumas also appear to be particularly sensitized to the depressive effects of acute stress in adulthood [17]. It should be specified that regardless of age, children exposed to chronic and repeated stressors, such as victims of physical and sexual abuse, war, or harassment, may develop personality changes, various self-harming and suicidal behaviors, depression, or other psychiatric disorders. Exposure to trauma in these formative years can also influence the maturation of the central nervous system and neuroendocrine systems. A review of the neurobiological sequelae can be found in van der's research Kolk [18], while the clinical implications of these aspects for PTSD were explained in research by Cohen et al. [19]

In conclusion, we can state that it is important that the traumatized child can talk to adults about the trauma because in this way he can: a) restore the experience in memory and prevent forgetting; b) help the child interpret the experience; c) correct misunderstandings; d) help the child manage and regulate his emotions; and e) provide information on coping strategies and facilitate their implementation [20].

3. Post-traumatic stress disorder and other comorbid situations

Finally, with respect to comorbidity, we can state that it is also known that people who are victims of serious trauma can also undergo permanent changes in their personality (e.g., develop personality disorders), or on the contrary, if the personality disorders were already existing, they can make in turn the subject most vulnerable to PTSD [21]. Other studies have also found the following to be associated with PTSD: eating disorders, dissociative episodes of varying degrees, antisocial, and aggressive manifestations [22].

It is also important to specify with regard to dissociation that trauma can modify a person's brain structure and functions [23], and individuals under severe stress can also initiate dissociation, which is an autohypnotic process that anaesthetizes and isolates pain [24].

It should be specified here that the specificity of the trauma creates peculiar consequences, for example, those who suffer violence in childhood are more likely to suffer dissociative symptoms and amnesia, so it has been considered that violence suffered in childhood has different consequences from those, for example, of a cataclysm or other trauma circumscribed in adult life. It also turns out that those who dissociate at the time of trauma are more vulnerable to post-traumatic reactions [25].

As Bromgerg states, dissociation comes into play when a chaotic flow of unregulated affects takes place in the mind, threatening the stability of the self and sometimes mental health itself [26].

It also appears that subjects with PTSD present an increased risk of suicide, especially if they have a diagnosis that highlights comorbidity with depression [27].

Furthermore, after a post-traumatic experience, physical health can also be compromised in other ways, in general, there is a greater incidence of asthenia, headaches, chest pain, and gastrointestinal and cardiovascular disorders [28]. Undoubtedly, many of these physical signs are also common to depression.

However, it must be added in this regard that several depressive episodes begin as a consequence of an event, a loss, which can be mourning, but also the loss of a social position, of autonomy, the loss of a role, all the factors which were considered essential

for the subject and for maintaining his or her psychic balance and these events can be experienced as a trauma, regardless of whether they caused PTSD or not. We can assert that after a traumatic event, whatever it may be, it is not always an easy task to diagnose depression in a subject who requires psychological consultation due to suffering that has been dragging on for some time, which cannot be fully defined, since the depressive disorder, such as PTSD, presents with various signs and can be confused with other symptoms. It therefore seems very important to make a precise diagnosis both to start psychotherapy and to introduce pharmacological support [29].

4. Possible diagnostic pictures in adults

The need to take into account the complexity of post-traumatic stress disorder and possible comorbidity has been highlighted; therefore, the use of multiple diagnoses is a valuable element in the treatment of stress response syndromes, and PTSD in particular [21], therefore making an accurate diagnosis and taking into account the difficulties it entails is important for planning an adequate therapeutic intervention.

Great attention must therefore be paid to the clinical diagnosis, where it is necessary to distinguish whether the diagnosis of PTSD is secondary or primary to parallel co-diagnoses. Among the tests used to identify PTSD, we mention, for example, the MMPI-2- post-traumatic stress disorder scale and the post-traumatic stress disorder symptom scale PSS [30]. To evaluate PTSD in children, child PTSD symptom scale was developed. A 17-item scale developed by Edna Foa and collaborators [31], it was used both in initial diagnosis and in monitoring progress and contains a brief assessment of functional impairment.

To evaluate Instead more generally _ the impact of the trauma was created the adult scale "The Impact of Event Scale" [32] later adapted for use with children and adolescents [33].

It is necessary for PTSD assessment to be evaluated. Also, exposure to trauma and examine the etiology of the disorder, that happens in adults in general In the context of a retrospective self-report and during an interview clinical [34] in which the identification of clinical cases of PTSD is important, that is, establishing the threshold for detecting the presence of the disorder or not, a very complicated task due to the presence of subclinical diagnostic pictures or characterized by comorbidities.

The clinical interview, characterized by a systematic collection of information, is one of the most widespread tools for obtaining information for the purpose of diagnosis and the creation of a therapeutic project; to plan a therapeutic intervention, it is also desirable to also investigate the patient's history prior to the trauma and his levels of adaptation, integrating them, if possible, with the information provided by the person closest to the patient [35].

It should also be remembered that the onset of disorders following serious traumatic events can occur in a period of time distant from the traumatic episode, for this reason, it is often necessary to also carry out longitudinal observations of patients who have experienced traumatic events.

In the case of an assessment with children, it is possible that it is useful to focus on the child's traumatic experience already in the first session; the use of systematic assessment of both the child's exposure to trauma and its effects should be incorporated into a clinical interview in which the child or adolescent can describe their experience with a wealth of clinical information that can determine the choice of therapy. For single traumas, it is advisable to provide the child with help from the first session

(i.e., a simple method to reduce intrusive thoughts) that helps him with his most annoying symptom, this will increase the patient's optimism and motivation to return. When meeting and evaluating a child, drawing can also be used as a communication tool. If children are given the opportunity to draw about an emotionally charged event while talking about it, children between 3 and 9 years of age report more detailed verbal accounts than when asked to provide an account without drawing [11].

As already specified, the diagnosis of PTSD, like that of depression, both in the case of adults and in the case of children and adolescents, is a complex diagnosis, articulated on several phenomenological levels and it is therefore important in the diagnosis to have a clear knowledge of the syndromic grouping of disorders; in this regard, already in the 90s, various studies appeared relating to the procedures and criteria for diagnostic differentiation between PTSD and other psychopathological forms [22].

5. Common therapeutic goals in the treatment of traumatized adults

In the last three decades, more and more attention has been paid to mental health pathways to address PTSD [36] and despite a diversity of techniques and approaches in the treatment of PTSD, some similar psychotherapeutic objectives are envisaged. Meichenbaum [37], illustrating the most important psychotherapeutic "judes -lines," states that the objectives can be:

- Help the patient to rework their story, reliving and recounting the trauma in the "here and now," modifying the way in which it is narrated, in order to achieve integration and a "sense of control" of the experience. A possibility to "find meaning" to the events experienced must also be provided. A feeling of dominion over intrusive memories and the ability to tolerate discomfort is therefore obtained, making the patient capable of reliving traumatic memories, but with a relatively high degree of voluntary control.

- Reexpose the patient to stimuli and signals related to the trauma, but in a structured way and with psychological support (e.g., using "direct exposure," various guided imagery, hypnosis, support, and gradual reexposure techniques to stress).

- Focus on beliefs, ideas, and opinions that have been "destroyed" in the patient and have caused intrapersonal and interpersonal difficulties; through cognitive restructuring, problem-solving and creative writing techniques; they are therefore faced with feelings of guilt, anger, fear, sadness, desperation, victimization, and disorientation.

- Starting from the traumatic event itself, the personal resources that could be the basis of growth are examined, to move, for example, from the position of victim to that of survivor; to achieve this goal it is important to help change the patient's temporal orientation (from a focus on the past to a perspective centered on the present and future); the development of more satisfying lifestyles and closer and stronger social supports is thus encouraged.

- Encourage the patient to activate his resources connected with the belief system (e.g., religious and philosophical convictions and beliefs).

- The therapist must not provide meanings to the patient, but they must be found by the patient himself, for example by attending groups of people who have been exposed to the same trauma; it is important to help him reconstruct his past experience, increasing the feeling of having future goals [38].

It is also important to remember that Otto Kerberg states that in order to process trauma in a psychotherapy process, it is important that stability, security, and empathy are present [38].

Finally, it is necessary to know that although there are main "guidelines," similar for the different therapies, patients suffering from PTSD may differ regarding the number, intensity, type, and duration of the traumatic events suffered, and also the individual variables and coping strategies can change from subject to subject; therefore, the assessment strategies, the criteria for diagnostic decisions, and the different approaches to the treatment of this disorder must be chosen based on the specificity of each individual case, for example, it is not advisable to approach "combat-related PTSD" and "civilian-related PTSD" [39].

6. Conclusions

We have specified what are the psychotherapeutic objectives common to the various approaches in the treatment of a traumatized adult but it must be remembered up front that for the majority of psychopathologies today the scientific community has moved the debate from the search for the best treatment between psychology and psychotropic drugs, in a logical in contrast, to a logic of integration of both approaches starting from the assumption that both treatment philosophies have scientifically demonstrated their usefulness [40]. In fact, in scientific studies, it has been proven that the effects of the antidepressant and psychotherapy alone were equal and significantly less effective than the combined treatment [41]. In conclusion, we must underline from the outset how there is a need for patients to be able to speak and be listened to by a mental health professional capable of taking charge and understanding the problems that are brought forward, regardless of the fact that a more pharmacological or psychotherapeutic [40]. The future of research in the field of pharmacotherapy and psychotherapy nowadays can no longer be represented by a sterile struggle for one's emancipation and affirmation but is aimed at studying the best integration of the two therapeutic approaches, that is, psychotherapy and pharmacotherapy, with contemporary use or sequential and this point of view is now accredited and recognized (and regarding sequential use the improvement induced by pharmacological therapy can allow the inclusion of psychotherapy in difficult patients, who without any form of help can degenerate into chronicity).

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Chapter 4

Chinese Traditional Medicine: The Mechanism of Acupuncture and Moxibustion in Treating Depression

Xiong Chen, Chun-qi Ai, Chunming Ma, Heyangzi Gong and Keke-Ma

Abstract

Depression is one of the most common mood disorders, which seriously affects public health. The efficacy of acupuncture and moxibustion on depression is clear without obvious adverse reactions, which has high clinical value. This chapter reviews the clinical research of acupuncture and moxibustion in the treatment of depression in recent years, summarizes and discusses the pathophysiological mechanism of acupuncture and moxibustion in the treatment of depression and the integrated treatment of acupuncture and moxibustion, in order to provide theoretical guidance and scientific basis for clinical acupuncture and moxibustion in the treatment of depression.

Keywords: Chinese traditional medicine, acupuncture and moxibustion, depression, mechanism, theoretical guidance, scientific basis

1. Introduction

Depression is a kind of mental disease that seriously affects public health. There were about 322 million patients with depression worldwide, accounting for 6.2% of the total disease burden [1]. There is still a bottleneck in the treatment of depression in modern medicine, and only 27% of patients have achieved clinical recovery [2]. At the same time, the treatment of commonly used antidepressants, such as selective serotonin reuptake inhibitors (SSRIs) and tricyclic antidepressants (TCAS), has delayed efficacy and a variety of adverse reactions, which seriously affect the medication compliance. Acupuncture and moxibustion has definite curative effect on depression without obvious adverse reactions, and has high clinical application value.

2. Pathophysiological mechanism of depression

The pathogenesis and etiology of depression are complex, and have not yet been fully clarified. The biological factors that may be involved include neurobiochemical

mechanism, neuroendocrine mechanism, neuroelectrophysiological mechanism and neuroimaging changes [3–6]. In addition to the above biological mechanisms, psychological and social environmental factors also play an important role in the occurrence and development of depression. However, traditional Chinese medicine classifies depression as "depression disease", which is caused by sudden, strong and lasting negative emotional stimulation or thoughtful and sentimental personality. In the early stage, qi stagnation is the main factor, and qi stagnation is caused by stagnation of liver qi, and qi stagnation is caused by blood stasis and phlegm coagulation, which can further turn into fire, but the disease is based on stagnation of liver qi; It can be seen that the Qi and blood in the heart, spleen, liver and kidney are deficient in Yin and Yang. In addition, in the early stage, it is mostly stagnation of liver qi, stagnation of liver qi and deficiency of spleen or damp heat of liver and gall. Over time, it will lead to deficiency of both heart and spleen, kidney deficiency, stagnation of liver Qi or deficiency of heart and gall Qi [7].

2.1 Neurotransmitters and receptors

At present, most studies believe that the pathogenesis of depression is mainly related to the changes of monoamine neurotransmitters such as 5-hydroxytryptamine (5-HT), dopamine (DA) and noradrenaline (NE) in the hippocampus of the brain. The disorder of these neurotransmitters is the basis of the pathophysiology of depression [8]. Some experiments have proved that cranial suture needle can enhance the stimulation to the amygdala of temporal lobe, so as to regulate the metabolism and release of 5-HT and NE, and increase their content and function [9]. Xiao [10] observed the effect of Jieyu Anshen acupuncture on neurotransmitters in post-stroke depression model rats. After treatment, the contents of 5-HT, NE, Gamma-amino butyric acid (GABA) and other neurotransmitters in hippocampus of rats in the acupuncture group increased significantly, indicating that acupuncture treatment of depression may play an antidepressant role by regulating the contents of the above neurotransmitters. In addition, the incidence of depression is also related to the functional changes of neurotransmitter receptors. The content of 5-HT and the function of 5-HT1A receptor in frontal cortex of rats with chronic unpredictable mild stress depression were measured after acupuncture treatment. The results showed that correcting the dysfunction of 5-HT1A receptor may be one of the ways for acupuncture to exert its antidepressant effect [11].

2.2 The neural plasticity

The changes of neuroplasticity are specifically manifested in the changes of neurons and glial cells, as well as the obstacles of signal transduction in neurons, which are closely related to the occurrence and development of depression [12, 13]. Therefore, regulating the regeneration of neurons and glial cells and mediating related signal pathways to restore neural plasticity is also one of the main mechanisms of acupuncture and moxibustion in the treatment of depression. Sun [14] used Tongdu Tiaosheng acupuncture to treat post-stroke depression model rats. The results showed that acupuncture could improve the behavior of depression rats by repairing the damage of hippocampal neurons. When Baihui (GV20) and Anmian (EX-HN17) were stimulated with 4/60 Hz for 3 weeks, the proliferation of hippocampal progenitor cells was up-regulated [15]. Other experiments showed that 2/100 Hz electrical stimulation every other day in Baihui (GV20) and Yanglingquan (GB34) for 15 days could increase the proliferation of neural progenitor cells [16, 17]. Glial fibrillary

acidic protein (GFAP) is a protein marker of astrocyte activation. The experiment showed that the expression of GFAP in hippocampus and prefrontal cortex of depression rat model increased. When acupuncture was given to Baihui (GV 20) and Yintang (GV 29) and bilateral Sanyinjiao (SP 6) for 20 minutes, once a day for 28 days, it was found that the expression of GFAP was inhibited and the morphology of astrocytes in depressed rats was significantly improved [18]. So acupuncture may play an antidepressant effect by regulating the expression of GFAP and repairing astrocyte damage.

The mechanism of acupuncture in treating depression may be related to the inflammatory response and amino acid metabolism mediated by different signal pathways [19]. c-Jun N-terminal kinase (JNK) is a member of mitogen activated protein kinase mitogen-activated protein kinases MAPKs pathway, and its activation plays an important role in the etiology and pathogenesis of depression [20–22]. Acupuncture or electroacupuncture can reverse the stress-induced upregulation of mitogen-activated protein kinase kinase 4 (MKK4), mitogen-activated protein kinase kinase 7(MKK7) and p-JNK in hippocampus, and may reduce the rate of hippocampal apoptosis. Inhibition of JNK activity can protect nerve cells [23].

In addition, the typical symptoms of depression patients include inability to feel happy and lack of motivation. These negative symptoms can be attributed to the destruction of reward circuit [24]. Wang [25] after acupuncture combined with fluoxetine for 8 weeks, the increase of resting-state functional connectivity between the lower ventral striatum and the medial prefrontal cortex, the ventral cranial nucleus and the amygdala / parahippocampal area was significantly positively correlated with the decrease of depression scale score (Montgomery–Åsberg Depression Rating Scale and Self-Rating Depression Scale scores), indicating that acupuncture may achieve the therapeutic effect by regulating the reward / motivation circuit of the cortical striatum in patients with severe depression.

2.3 Neuroendocrine regulation

The relationship between nervous system and endocrine system is mainly manifested in the regulation of hypothalamus pituitary adrenal axis (HPA), hypothalamus pituitary thyroid axis and hypothalamus pituitary gonad axis. The activation and disorder of HPA axis are closely related to depression [26]. The changes of corticotropin releasing hormone (CRH), adrenocorticotropic hormone (ACTH) and serum cortisol (CORT) in hypothalamus and plasma of patients with depression can reflect the regulatory function of HPA axis on nervous system. Studies have conducted Electroacupuncture Treatment on Guanyuan (CV4) and Zusanli (ST36) of rats with chronic mild stress depression, and found that electroacupuncture can down regulate the expression of CRH mRNA in rat hypothalamus and reduce the levels of ACTH and CORT in plasma [27]. In the mild depression model of rats induced by water immersion stress for 1 week, acupuncture at Baihui (GV 20) and Yintang (EX-HN3) was used to measure the immobility time and serum corticosterone level of rats. It was found that the immobility time and serum corticosterone level decreased after acupuncture stimulation [28]. These results suggest that acupuncture can regulate HPA function to improve depression.

2.4 Neuro immune regulation

The abnormal activation of immune system in patients with depression may be related to the abnormal secretion of inflammatory cytokines, and the level of

inflammatory cytokines is significantly different before and after antidepressant treatment [29]. Li [30] found that acupuncture treatment can reduce the number of NLRP3 inflammatory corpuscles and TUNEL positive cells in the prefrontal cortex of depression like rats, indicating that acupuncture may participate in inhibiting the activation and apoptosis of NLRP3 inflammatory corpuscles in the prefrontal cortex to produce antidepressant effect. Wang [31] found that acupuncture and moxibustion reversed the up regulation of gene sets related to toll like receptor signaling pathway and nod like receptor signaling pathway related to inflammatory response and immune response. Therefore, increasing the content of anti-inflammatory cytokines or inhibiting the level of pro-inflammatory cytokines may be one of the mechanisms of acupuncture and moxibustion in the treatment of depression by regulating the immune system.

3. Integrated acupuncture and moxibustion therapy

On the basis of holistic concept and syndrome differentiation and treatment, subthreshold depression and mild to moderate depression may be more suitable for intervention with traditional Chinese medicine or integrated traditional and Western medicine; Some special types and groups of depression can also give priority to the intervention of traditional Chinese medicine or the combination of traditional Chinese and Western medicine, such as children and adolescents' depression, perimenopausal depression, postpartum depression, stroke, tumor, diabetes and other associated depression. The dose of Western medicine can be appropriately reduced to reduce or avoid the adverse reactions caused by western medicine.

Acupuncture and moxibustion treatment of depression is mainly based on disease differentiation, supplemented by syndrome differentiation and symptomatic selection. The course of treatment is generally 4 ~ 6 weeks. The main effect in acute stage is to improve symptoms and reduce adverse reactions of Western medicine; Consolidation period and maintenance period are to prevent recurrence and relapse. Mild depression can be treated with acupuncture alone, moderate depression can be treated with intensive cranial electroacupuncture stimulation, and severe depression can be treated with western medicine and acupuncture. According to the recommendations of relevant Chinese guidelines, the general population with depression is recommended to adopt the method of regulating mind and soothing the liver, with electroacupuncture at Yintang and Baihui as the main points; For patients who could not afford electroacupuncture, it is recommended to use filiform needling, and the acupoint selection and course of treatment are the same as that of electroacupuncture; For patients with more somatization symptoms, it is suggested to select corresponding acupoints for symptomatic treatment according to the main clinical manifestations; For patients with sleep disorders, it is suggested to adopt the method of regulating the mind and soothing the liver, with electroacupuncture at Baihui, Yintang or Sishencong as the main points. Mild to moderate depression patients who could not tolerate acupuncture treatment can be treated by pressing beans on ear points, and moderate to severe depression can be treated by regulating mind and soothing the liver. The treatment of post-stroke depression and menopausal depression should consider the treatment of primary disease while treating depression. In addition, according to the patient's condition, acupoint massage, acupoint stimulation and regulation, traditional Chinese medicine psychotherapy, five element music therapy and other treatments can be used at the same time [32, 33].

Investigators	Sample size	Intervention	Acupoints	Frequency	Outcomes	Mechanisms
Wei Xiao et al.	40	normal group, model group, medication group and acupuncture group, with 10 rats in each.	"Baihui"(GV 20), "Fengfu" (GV 16), bilateral "Shenmen" (HT 7) and "Taichong" (LR 3)	20 min, once a day for 21 days	Acupuncture can improve the locomotor function changes in stroke rats with depression after stroke	Suppressing the up-regulated cortical ACh, GABA, Glu contents, the expression levels of 5-HT1AR and NEα2R proteins in the hippocampus, raphe nucleus and LC, and the down-regulated 5-HT and NE contents in the cerebral cortex and 5-HTT protein expression levels in the hippocampus, raphe nucleus and LC.
Lixing Chen et al.	40	normal control, chronic unpredictable mild stress, electroacupuncture, and paroxetine groups.	GV 20, "Yintang"(GV 29)	30 minutes daily	Electroacupuncture treatment can alleviate depression-like symptoms in chronic unpredictable mild stress rats.	The underlying mechanism may include promoting the expression of 5-HT1A receptor mRNA and protein, thereby improving synaptic plasticity in the hippocampus.
Pei-Yang Sun et al.	48	a sham-operation group, a model group, a Tongdu Tiaoshen acupuncture group and a non-meridian-non-acupoint group	GV 20, "Shuigou" (GV 26), "Shenting" (CV 24) and "Dazhui" (GV 14)	40 min in each treatment and the needles were manipulated at the acupoints once in 20 min	The Tongdu Tiaoshen acupuncture improves the behavior of the model rats with post-stroke depression, repairs hippocampal neuronal damage,	It's probably related to the contents of hippocampal monoamine neurotransmitters (NE, 5-HT and DA).
Liu Yang et al.			GV20, Yang-Ling-Quan(GB34)	on day 15 and were treated for 2 weeks	After 8 treatments, electroacupunture generated a clear antidepressant effect on the stressed rats.	Promoted the neural stem cell proliferation

Investigators	Sample size	Intervention	Acupoints	Frequency	Outcomes	Mechanisms
Sha Dong et al.	32	control, model, acupuncture, and medication	GV20,GV29, "Sanyinjiao" (SP 6)	20 min, once daily for 28 days	GFAP protein expression were considerably suppressed in medication and acupuncture groups	Acupuncture may play an antidepressant effect by regulating the expression of GFAP and repairing astrocyte damage.
Zengjian Wang et al.	46	fluoxetine group and acupuncture plus fluoxetine		8 weeks	The increase of resting-state functional connectivity between the lower ventral striatum and the medial prefrontal cortex, the ventral cranial nucleus and the amygdala / parahippocampal area was significantly positively correlated with the decrease of depression scale score.	Acupuncture may achieve the therapeutic effect by regulating the reward / motivation circuit of the cortical striatum in patients with severe depression
Jing-jing Le et al.			Guanyuan (CV4) and Zusanli (ST36)	14 days	Electroacupuncture treatment reversed The behavioral deficiency induced by chronic unpredictable mild stress in rats.	Electroacupuncture treatment could act on depression by modulating HPA axis and enhancing hippocampal 5-HT/5-HT1AR in chronic unpredictable mild stress Rats.

ACH: acetylcholine;GABA: gamma aminobutyric acid; Glu: glutamate; 5-HT1AR: 5-HT 1 A receptor; NE: norepinephrine; NEα2R: alpha receptor 2; LC: locus coeruleus; and DA: dopamine.

Table 1.
Summary of acupuncture and moxibustion for depression.

4. Summary and prospect

The therapeutic effect of acupuncture and moxibustion on depression is clearly the result of multi-target and multi-dimensional interaction (**Table 1**), but the depth of research on this mechanism still needs to be strengthened. Future research should explore the difference of acupuncture and moxibustion intervention mechanism on different Traditional Chinese medicine (TCM) syndrome types of depression. And explore the differences of different acupuncture therapies or different acupoint selection mechanisms. In conclusion, although the research on the mechanism of acupuncture and moxibustion in the treatment of depression has made some progress, it is still necessary to continuously broaden the thinking and strengthen the research, so as to give full play to the advantages of acupuncture and moxibustion in the treatment of depression and contribute to better clinical efficacy of depression.

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Conflict of interest

The authors declared that there was no potential conflict of interest in this article.

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Chapter 5

Exploring an Animalistic, Trauma-Informed Framework to Understand Depression, and the Need for Effective, Non-Traditional Psychotherapeutic Interventions That Attend to Physiological Processes

Philippa Williams

Abstract

Drawing on historical and current medical model trends, as well as the epistemologies and their impact for how we understand depression, leads to the crucial question for whether depression is a permanent or curable human phenomenon. Presenting animalistic and evolutionary perspectives within a biopsychosocial framework offers choice to individuals experiencing depression, that symptoms may be inherently fluid and a temporary part of the human condition. Furthermore, that early childhood attachment and trauma can shape our predisposition for experiencing depression is discussed. Neurobiological and neurochemical processes are identified as driving factors for depression from a trauma-informed lens, and psychotherapies that incorporate animal, nature, and somatic elements are offered as alternatives for supporting a biopsychosocial, body-based way of working with depression.

Keywords: depression, somatic, animal assisted therapy, TRE, medical model, biopsychosocial model, ecotherapy, trauma-informed

1. Introduction

For the last half century, the medical understanding of depression has generally dictated the definitive models, treatment and discourse used within society today, with little consideration for a biopsychosocial influence [1]. With an ever-growing body of research that is challenging these fundamental frameworks and understanding of depression, there is much need to review and consider additional ways of understanding depression and efficacious treatment applications.

The World Health Organisation (WHO)	Centers for Disease Control (CDC)
• Poor concentration • Feelings of excessive guilt or low self-worth • Hopelessness about the future • Thoughts about dying or suicide • Disrupted sleep • Changes in appetite or weight • Feeling very tired or low in energy	• Feeling sad or anxious often or all the time • Not wanting to do activities that used to be fun • Feeling irritable, easily frustrated, or restless • Having trouble falling asleep or staying asleep • Waking up too early or sleeping too much • Eating more or less than usual or having no appetite • Experiencing aches, pains, headaches, or stomach problems that do not improve with treatment • Having trouble concentrating, remembering details, or making decisions • Feeling tired, even after sleeping well • Feeling guilty, worthless, or helpless • Thinking about suicide or hurting yourself

The World Health Organisation (WHO) [4]; Centers for Disease Control (CDC) [5].

Table 1.
Symptoms of depression.

Depression, understood as a mood disorder, is both a medical and lay-person term for a broad range of symptoms [2]. According to the American Psychological Association [3]:

"Depressive disorders include disruptive mood dysregulation disorder, major depressive disorder (including major depressive episode), persistent depressive disorder, premenstrual dysphoric disorder, substance/medication-induced depressive disorder, depressive disorder due to another medical condition, other specified depressive disorder, and unspecified depressive disorder. The common feature of all of these disorders is the presence of sad, empty, or irritable mood, accompanied by related changes that significantly affect the individual's capacity to function (e.g., somatic and cognitive changes in major depressive disorder and persistent depressive disorder). What differs among them are issues of duration, timing, or presumed etiology" (**Table 1**).

Although generally pathologised in our society through over-reliance of the medical model [6], it is widely understood that the symptoms of depression fall into many other categories of diagnosis, and as descriptors for other disorders [7]. It is, and has therefore been open to debate for decades as to whether depression is simply a part of the human condition [8].

2. Traditional and current medical model concepts for depression

According to Hindmarch [9], one of the oldest, and most widely used theories for national healthcare systems around the world for treating depression, is the Monoamine Hypothesis [10]. This theory understands depression as being caused by a neurotransmitter depletion of serotonin, dopamine and norepephrine in the nervous system, which among other properties, serves to regulate mood. To put this literally, it is argued that depressive feelings and behaviours occur as a result of a

chemical imbalance within the person, consistent with the individualistically positioned medical model approach, going as far as to say that depression is a disease and life-long disability [11].

Historically, the evidence base for the monoamine theory was driven by reported effects of anti-depressants, specifically, selective serotonin re-uptake inhibitors (SSRI), which provide synthetic serotonin to the brain, relieving depressive symptoms. According to Hillhouse and Porter [12], after almost half a century, treating depressive symptoms with anti-depressants based on the monoamine hypothesis, has shown that recovery rates are often less than 60%, and where symptoms may be alleviated from this methodology, there is a delayed onset prior to recovery. Delgado [13] argues that there is insufficient evidence to support the theory that patients with major depressive disorders have an underlying monoamine dysfunction, due to the 'absence of direct measurements of monoamines in humans' not being recordable. Furthermore, that studies have found dysfunctional monoamine levels in people who are functioning typically, and not ever suffered with depressive symptoms, discredits the cause for depression as being solely due to a neurotransmitter chemical imbalance.

The monoamine hypothesis has contributed important findings to depression research which has led to more recent understandings for SSRIs influencing key neuroplasticity areas which improve depression- related symptoms [14]. According to Price and Dunman's [15] Integrative Model of Neuroplasticity, the brain-derived neurotrophic factor (BDNF) theory suggests that SSRIs are beneficial in transducing the neuroplasticity changes that are needed to improve symptoms of mild and chronic depression caused by severe stress, as opposed to offering an effective solution for neurotransmitter chemical depletion, in line with Delgado's [13] hypothesis. Specifically, hippocampal and cortical atrophy has been found to correlate with and represent depressive behaviours, and research over the past decade purports the efficacy of SSRIs, as well as ketamine for improving atrophy in BDNF expression and signalling in people with depression, suggesting a plausible neurological explanation.

In line with the SSRI treatment protocol, which proposes that the aetiology lays within the person, the National Institute for Clinical Excellence (NICE) [16] in the UK, recommends antidepressants and Cognitive Behavioural Therapy as the recommended treatment protocol for varying levels of depressive disorders. Cognitive psychotherapy treatment models such as Beck [17] understand all symptoms of depression, including biological factors such as loss of appetite and sleep disturbance; systemic factors, such as interpersonal relationships and work environment, as being consequential to a person's core beliefs and negative thinking patterns about themselves and their lived existence. In its basic form, it is inferred that the negative cognitive appraisals create and maintain feelings of depression, and behaviours relating to the feeling and thought. Furthermore, that people with depressive tendencies hold a negative attention bias with cognitive distortions, which alongside the feelings and behaviours that follow, create a self-fulfilling prophecy. In short, it is therefore hypothesised that if the core beliefs can be established and changed, the feelings and behaviours that are maintaining the depression will also change. This approach fits an individualistic, pathologising paradigm consistent with the medical model, suggesting again, that the person (or at least their thinking) is faulty, and the issue lays within them. This way of understanding depression as it relates to a person's existence in the world, negates the potential for other environmental and systemic influences as attributing towards the cause for the depression, and instead places salience on the neurological, cognitive and psychological function of the person (e.g., [18]).

In keeping with the medical model approach to assessing depression, is Beck et al. [19] psychometric scale, known as the 'Depression Inventory', which despite its age, is still globally used today to determine if a person qualifies for a diagnosis of depression. Psychometric measures and diagnosis offer an understanding or explanation for a person's symptoms, and as such can sometimes be experienced as a relief for the individual [20]. Furthermore, within the realms of understanding a person's symptomatology in this way, a psychological diagnosis has the potential to form an evidence-based treatment plan, which Paul [21] set about to create by asking the following question: "What treatment, by whom, is most effective for this individual with that specific problem, under which set of circumstances, and how does it come about?" (p. 44). Whilst a poignant piece of research at the time, both impacting and improving world-wide access to evidence-based psychotherapies, it also pushed a psychiatric, thus medical model bias towards treatment options for depression, through a heavy lenience on random-control based research, that focused on the symptoms and treatment protocol only. Assuming a position of diagnosis for depression begs the question as to whether the outlook for prognosis offers recovery, cure or a lifelong disability, thus limiting options for individual lived-experience. It could further be argued that the existential meanings that can be derived from such a label, for example: hopelessness (one of the main symptoms of depression), and the impact of living with a life-long diagnosis/label of depression, may also be founded by this methodology, creating a maintenance type cycle of hopelessness/depression [22]. In other words, in providing a diagnostic approach to depression and using the evidence-based treatment protocols, this approach may cease to take into account other environmental, systemic and interpersonal factors that might influence a person's depression, and by denying these aspects, presents a dilemma for whether a diagnostic approach of depression limit's a person's ability to recover.

Johnstone [23] discusses at length the largely accumulated evidence-base for psychiatric diagnosis. As mentioned above, there are clear benefits to diagnosing and the treatment that can be offered for depression and other diagnoses. That said, diagnosis and the medical model can be confining: the label is for life, and thus the individual is put in a powerless position in regards to hope for progress or change, and instead is reliant on pharmaceutical treatment and psychotherapies that in some cases (e.g., [16]) do not take into consideration environmental factors that may be able to change and thus alter the person's depressive state [20, 22]. According to Cipriani et al. [24], whilst there are reported benefits in cases where engagement and precise conformity to the antidepressant medication prescription are made by patients, there are also further arguments that medicating symptoms of depression can create a barrier for engaging in talking therapies, and concerningly report side effects of suicidality. Cipriani et al. [24] further postulate that SSRI antidepressants are prominent in these findings, and it could therefore be inferred that this research may put into disrepute any evidence for SSRIs being suitable or safe for use with BDNF for depression. In light of these findings, it could be advocated that a wider range of alternatives for understanding depression and the person's lived experience of this, as well as the 'why' for this way of being-in-the-world are lacking, leading to a restrictive treatment protocol that leans towards a unilateral, individualistic medical-model approach.

In consideration of the symptoms that specifically relate to depression, there is a potential danger for traumatising and shaming when labelling the issue as inherent to a dysfunction within the person, and consequently adding to the existing suffering [25, 26]. To pharmaceutically medicate a person in this position further takes away the possibility of hope and capacity for positive change to occur through other

means or reasons, particularly when evidence suggests that rates of pharmaceutical effectiveness are below 60%, and consequently the medication can be life-long [22]. In addition, if a person is on the severe spectrum of depressive symptoms, relying on their functionality in being able to consistently take medication may prove ineffective, as well as creating possible risk for suicidality [24]. In accordance with this appraisal, utilising the NICE [16] recommended cognitive talking therapies, which solely rely on cognitive function and consistent engagement for effectiveness, may also offer a paradoxical, non-desirable effect, particularly in cases where depressive symptoms are relating to environmental factors or another diagnosis such as trauma or PTSD [7]. It could therefore be reasoned that broader or alternative understanding for depression outside of internal neurological and cognitive dysfunction, and pharmaceutical intervention are needed in order to provide efficacious support that inhibits consistent positive change [27].

3. Biopsychosocial approaches

Whilst there are clear benefits to the medical model approach for depression and other presentations, research purports that a broader approach encompassing a person's environment and wider social systems is needed (**Table 2**).

Medical model	**Biopsychosocial model**
• Also known as the disease model. • Non-Cartesian- body and mind separate • It pathologises and uses a reductionist way of understanding the issue as being located within the person. E.g. Labelling and diagnosis. DSM5 • It does not take into consideration other internal or external systems as being linked, e.g. systems such as environment, home, work, school, nature, social etc. • The diagnosis does not change over time • It conceptualises health as being present when disease is not- is therefore is not all encompassing of the human as an entirety within their environment, e.g. economic stress/ crisis causing heart attack/ anxiety, suicide • It uses a medical treatment framework for issues, utilising CBT for depression for example, in a prescribed way. See NICE website. Anxiety/depression models: cognitive, diagnosis • Therapeutic modalities that fall into this category: CBT, evidence-based models, e.g. EMDR using a prescribed number of sessions) Not uncommon to prescribe cognitive therapy & pharmaceutical intervention together	• Engel, 1977 felt it necessary to widen the approach to dis-ease to include the psychosocial without sacrificing the huge advantages of the biomedical approach. • Cartesian- body and mind as one • The biopsychosocial model extends beyond medical-treatment and looks at the patient's unique biological, psychological, social, co-morbidities, illness beliefs, coping strategies, fear, depression, employment, and financial concerns and may give further insight into what has hindered past recovery and sustained a position of dis-ease • Additionally, the biopsychosocial model understands that pain/distress can be a dynamic entity that changes over time and is affected by a person's internal and external environment • Holistic framework, can use pathologizing and non-pathologizing language, diagnosis and other to understand a presentation • Modalities that fall into this category: systemic, existential, humanistic. Could apply most models to this framework when used in a holistic way

Medical model [28]; Biopsychosocial model [18].

Table 2.
Biopsychosocial and medical model approaches to understanding mental health.

Engel's [18] biopsychosocial model was created due to some of the limitations named above with the intention of keeping the elements that were beneficial in terms of the evidence-based approach. Overall, it sought to offer an extension of the medical model which took into consideration factors such as the mind and body being conjoined and not separate; viewing the person as being part of their wider societal, work, religion, education structure, and biological, neurological, physical, psychological systems being interrelated. As such, it is possible to start to understand depressive symptoms as being changeable or fluid within addressing potential systemic or environmental changes, both external and internal to the individual's lived experience.

3.1 Evolutionary and animalistic concepts for depression

Darwin [29] proposes that as mammals we share six basic human emotions across the life span: anger, fear, jealousy, happiness, disgust, and sadness. It could be implied that any of these emotions can be present in someone who is experiencing depression when viewed from the biopsychosocial perspective, as it conceptualises health as being present when disease is not, consequently encompassing the human as an entirety within, and not separate to their environment. This ideology offers a view that as humans, our emotions, feelings and behaviours may be fluid and changeable and thus may also support the notion that 'symptoms' relating to depression are part of the human condition.

Neumann et al. [8] present an animalistic, evolutionary understanding that would make sense of depressive symptoms being a natural human response to factors such as economic stress or other crises that may further impact the person physically; for example, causing a heart attack; other symptoms such as anxiety; or in the worst case scenario, self-harm or suicide. As animals, and in particular, mammalians, our brain structure for processing emotions and responses to danger, stress or trauma, are extremely similar. The limbic brain, which is responsible for fight, flight, freeze, and the emotion centre, has been demonstrated through plentiful neuropsychological research to be similar for humans and animals; typically, in order of similarity: primates, horses, dogs, and cats, which is one of the reasons why animal assisted psychotherapies have a strong evidence base for efficacy for depression, and many other presentations [30]. It could therefore be understood, certainly on the most primal level, that responses to external, environmental factors are shared across mammalians with a limbic brain.

According to Darwin [29], some of the shared behaviours across the mammalian life span that can be likened to depressive 'symptoms' listed in **Table 1**, are: retreating to regroup, recharge, rest and mourn; as well as detaching interpersonally to recover from a physical or psychological event. Following this period of hibernation, animals then return to their social groups and integrate back into life. Other same and interspecies animals are accepting and non-judgemental of this, allowing time, understanding, social support and space for genuine and sustainable recovery. It could therefore be proposed that society and its systems; pathologising and its extension to lay-people, leads to a lack of understanding of depression being a fundamental part (and function) of the human condition [1]. Instead, precedence is given to neurological, biological and cognitive functions inside a person. The potential danger for an individualistic lens on depression is an inability for the individual and wider societal systems to allow recovery to take place: the option or choice to adaptively move in and out of depressive states is inherently taken away, and as such not accepted on a

systemic level by others as being 'normal', thus leading to othering and shaming of the depressed person [25].

Other factors that disinhibit the above type of recovery or fluidity in regards to depression, are public and medical shaming and othering, leading to shared societal belief-systems that being productive and constantly functioning in all areas of life is normal [25]; that to rest and regroup or take time out is negative; thus the maintenance cycle for depression continues and worsens over time, particularly where people are 'treatment-resistant' to the recommended protocols (CBT and anti-depressants) [16, 31]. This may be what is being seen in the MRi scans in research pertaining to neuroplasticity and BDNF theories for people with depression where consistent changes in the cortex and hippocampus have been evidenced [14, 15]. Research is therefore needed to move towards a biopsychosocial framework of understanding where the psychological, cognitive, and neurological changes can be understood within a wider environmental context in order to inform and provide best-practice treatment protocols, as it seems that a core theme of becoming stuck, as it relates to depression, is emerging in the literature [32].

4. Understanding trauma in relation to depression: physiological and neurochemical factors from a biopsychosocial perspective

"When your physiology is stuck, you are stuck. Trauma can be defined as being stuck in protective reflexes" Haines [33].

Drawing on primitive, polyvagal and triune trauma models for the context of this paper, Van der Kolk [34, 35] and Porges [36] indicate that in order to endure highly stressful or traumatic events both psychologically and physically, our bodies have primal survival mechanisms that become activated. Part of our brain, the limbic system (also known as the reptilian brain and emotion centre), helps to keep us safe in the moment by triggering one of three primal responses: fight, flight and freeze. Fight and flight responses are known as mobilisation, which occur when the sympathetic nervous system is engaged and releases the chemical, adrenaline. Adrenaline allows us to fight for our lives or run from danger. In doing so, it turns off the digestive system, allowing blood flow to be channelled to vital organs (heart, lungs, limbs), which is often why people experience nausea during or after traumatic events, or do not know how they managed to run with a broken leg, for example. The freeze response is understood as immobilisation or dissociation, which engages the parasympathetic nervous system, encouraging collapse. It allows the body to shut down and preserve the body's internal systems and passively avoid danger. All three of these responses allow us to be physically present during highly stressful or traumatic situations by removing awareness of thoughts, feelings, and sensations, either actively combatting the stressor (flight/flight/mobilisation), or shutting off from the stressor and passively avoiding it (freeze/immobilisation). As a side note, something that should also be considered in this physiological understanding of trauma, is a fourth response, known as social engagement. This response involves self-soothing and engaging with other humans through talking and accessing co-regulation of the nervous system, through sympathetic-adrenal influence, which is not always available in these situations. In effect it calms the system down, allowing the person to endure the stressor from a place of neutrality, as opposed to immobilising or mobilising.

4.1 Trauma and the environment

According to Mental Health Matters [37], understanding depression as being a fundamental part of the trauma model has been implied for the last century, as noted by key psychologists such as Freud [38]: hypothesis of sexual trauma and hysteria; and Bowlby's [39] attachment theory. These earlier ideologies have been backed up by international frameworks such as Adverse Childhood Effects (ACE's) [5], which offer decades of significant research to support the link between ACE's and psychiatric conditions, including depression. In particular, Bowlby's [39] attachment theory predicts that childhood neglect will create a trauma response throughout the human life-span. In support of this, evolutionary theories such as Eisenberger [40] depict that social connection is paramount for human survival. A varying range of biopsychosocial theorists and medical opinions are pointing to an understanding that depression is merely a part of being human; furthermore, that it is a typical and expected response to trauma and adversity; both in early childhood experiences as well as those endured in adulthood. In support of this, Porges [36] Polyvagal theory, proposes that as mammals, we experience life in one of three states: safe, mobilised, or immobilised (see **Figure 1**). In our optimum state of safety, we are regulated and open to social engagement, however, in response to perceived or extreme threat, we will move into a position of immobilisation (freeze/fawn/collapse) or mobilisation (fight/flight). Diseth [41] further offers neurobiological support of this theory that understands depression as a type of dissociative disorder in direct response to challenges within the environment, postulating that this primitive trauma feature enables a person to escape the present, lived-experience.

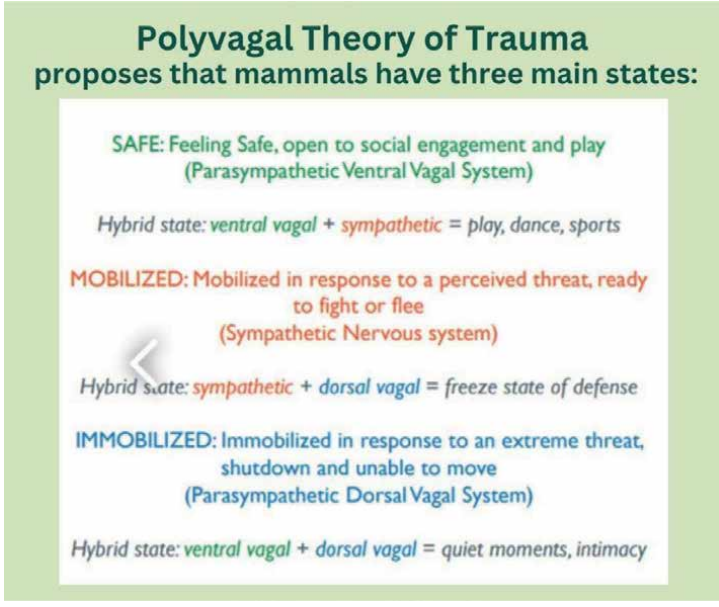

Figure 1.
Polyvagal theory: a model for understanding depression from a dorsal state [36].

4.2 Neurochemical responses to the environment

According to Van der Kolk [34], we have understood for over a century that a primal response to an individual or prolonged traumatic experience, is the release of neurochemicals in the brain for survival (see **Figure 2**). Specifically related to depressive symptoms, named in **Table 1**, is the opioid chemical release, which induces a lethargy response, allowing a mammal to freeze when in danger, and if this does not work, to later 'flop' or play dead [43]. Aside to being a fundamental process for trauma, the opioid system also plays a role in regulating mood. In their review, Jelen et al. [43] found that the opioid system is dysregulated when a person is experiencing depression, whether that be mild or severe, giving more credit to the notion that depression may be trauma related. Given that trauma symptoms are based on the physiology of being stuck [33], it is highly possible that depression could be understood through this analogy of being unable to recover from a freeze/opioid/depressed state. Additionally, from another perspective, it is widely reported that the endorphin release as it relates to all three of the trauma positions, and the relevant chemical release, is highly addictive [44]. It is often noticed within the psychotherapy platform, that clients with depression symptoms, not only appear to be stuck in a trauma position; but also seek to replicate and re-experience the feelings the endorphins initially provided. In conjunction, there is often a parallel goal of maintaining the position of stuck-ness, which can commonly be understood as the primary position of safety, thus representing a biopsychosocial and trauma perspective of depression.

Figure 2.
Trauma-induced imbalance of neurological chemicals [42].

4.3 Trauma or depression?

Gawęda et al. [45] explored the relationship between suicidality, depression, childhood trauma and other factors. They found a strong correlation between trauma and depression, adding weight to the hypothesis that depression may be a set of symptoms experienced following trauma, particularly when a person is stuck on the trauma loop cycle [33]. In more severe cases, being locked in a depressed state and unable to move fluidly out of it, suggests that there may be a trauma-related neurochemical imbalance, as well as a physiological freeze in the system. Alongside the physicality of experiencing depression, clients will often describe living life with the handbrake continuously on. Additionally, within this lived experience, it is commonly reported that there is struggle with motivation and procrastination cycles, as well as feeling 'foggy' in relation to cognition. Jelen et al. [43] postulate that the opioid system is further responsible for reward and well-being, and thus poses the question as to whether this aspect can be accessed when in an immobile trauma state, or whether in fact the opioid release *is* the reward. In support of this, Remes et al. [46] conclude from their biopsychosocial research on depression that 'functional dissociation' occurring on a cerebral level can be accountable for both the low mood and anxious states reported as symptoms (e.g., Ref. [4]) for this presentation, once again supporting the overlap between trauma and depression.

To conclude our understanding on physiological and neurochemical factors relating to depression, the research strongly supports the notion that there is a direct link between causation for depression, and maintenance of depression through a trauma lens [5, 45]. Furthermore, from a wider biopsychosocial perspective it can be argued that outside of the initial traumatic event(s), the primal immobile trauma response allows a person to maintain a position, or range of symptoms, relating to depression (see **Table 1**) where disengaging and escaping from life and coping with difficulties or adversities, can be achieved through a numbing mechanism gained from the opioid system [43, 44, 46]. As a final point, from an interpersonal perspective, given Eisenberger [40] denotes that we require social connection for human survival, and that the freeze response will isolate the person and negate possibilities for this to happen, it could also be proposed that being stuck in the immobile state of inaction alone could lead to ongoing, severe symptoms of depression, suicidality and death due to the inability of being able to physically or otherwise connect to others.

4.4 Physiological impact from stress and trauma as it pertains to depression

Historical and ongoing research has maintained a consistently strong curiosity and acknowledgement, certainly more recently, on the understanding and complexities that stress has on the mind and body [47]. For decades, studies have set out to understand what the acronym 'MUS' represents and means. Hashimoto et al. [48] investigated 'MUS' in relation to fatigue; a common symptom in depression, and shared among a broad range of other diagnoses. 'Medically Unexplained Symptoms', is a term that practitioners use within the medical healthcare systems, when a patient does not fit any category for diagnoses. Generally speaking, the research has turned a table in the last decade, with a move away from the 'MUS' umbrella category, to the 'Stress' category, in an attempt to account for 'unexplained' symptoms.

Remes et al. [46] postulate that depression is linked to the hypothalamic-pituitary-adrenal axis (HPA axis). The HPA axis forms part of the neuroendocrine system, and its main function is to respond to stress. In addition, it also regulates other systems such as the digestive, emotion, and immune, in response to environmental cues. Its

link to depression is framed in conjunction with HPA axis dysregulation caused by stress, purporting a direct link between the environment being a causative factor for depression. This can be further understood by its links to ACE [5] which create a predisposition towards maladaptive coping strategies to highly stressful or traumatic experiences. In particular, it is posited that early attachment wounds are predictors for mood disorders, for which category depression falls into.

Porges [36] vast research on Polyvagal theory has provided a strong compass for understanding depression as being part of the human condition. In line with Eisenberger [40], the polyvagal theory suggests that our need for connection in a life threatening experience is dependent on it as one of the main trauma responses (fight, flight, freeze, and social engagement). When available, social engagement can regulate the parasympathetic nervous system (PNS) through sympathetic-adrenal influence, allowing the person to endure the stressor from a place of neutrality, as opposed to immobilising or mobilising. The vagus nerve is responsible for controlling the PNS, which aims to regulate the body at rest. When vagal tone is high, resilience to stress is also heightened, and the body can maintain homeostasis. There has been a marked correlation between high vagal tone producing a positive feedback cycle, which promotes positive emotions. In contrast, low vagal tone leads to a negative feedback cycle, supporting the relevance of polyvagal theory in understanding depression.

Consistent with this view, when stressful environmental factors are present, and social co-regulation cannot be sought, an immobile, freeze position is often assumed and maintained, emphasising the very need for human connection [40]. Given the criteria for a diagnosis of depression are inclusive of social withdrawal and isolation (**Table 1**), it starts to imply that early childhood attachment wounds [39], and sexual trauma [38] are unequivocal explanations for depression being a safety behaviour to escape *from* human connection, which has previously been unsafe to access in early childhood years. This accounts for the maintenance cycle and other medical healthcare interventions that are ineffective, and offers a credible understanding for depression.

5. Recovery for depression in a natural world: psychotherapies supporting the biopsychosocial and trauma-informed models

5.1 The importance of addressing the body when working with depression

'We have evolved to move away from using our bodies as sensing tools in regards to primal safety, non-verbal communication [and] illness' ([49], p. 128).

It can be argued that being stuck in a trauma-response cycle will lead to significant dissociation from the body, as a natural response to perceived or actual threat, in order to endure physical or psychological pain [36]. In considering the body of research discussed above, which highlights the possibility of depression either being part of, or caused by trauma; or a response to navigating highly stressful or adverse environmental triggers, it is highly likely that disconnect from the body remains fairly consistent when experiencing depression [26].

When we experience highly stressful or traumatic situations, part of the brain called Broca's area (see **Figure 3**), responsible for retrieving verbal memory, shuts down [50]. Consequently, when considering effective interventions for addressing the symptoms of depression, this poses a barrier for talking therapies. In my experience, when clients are experiencing severe distress in a room-based psychotherapy setting, relying on interventions such as Beck's [17] CBT, can lead to clients freezing and being unable to speak. At

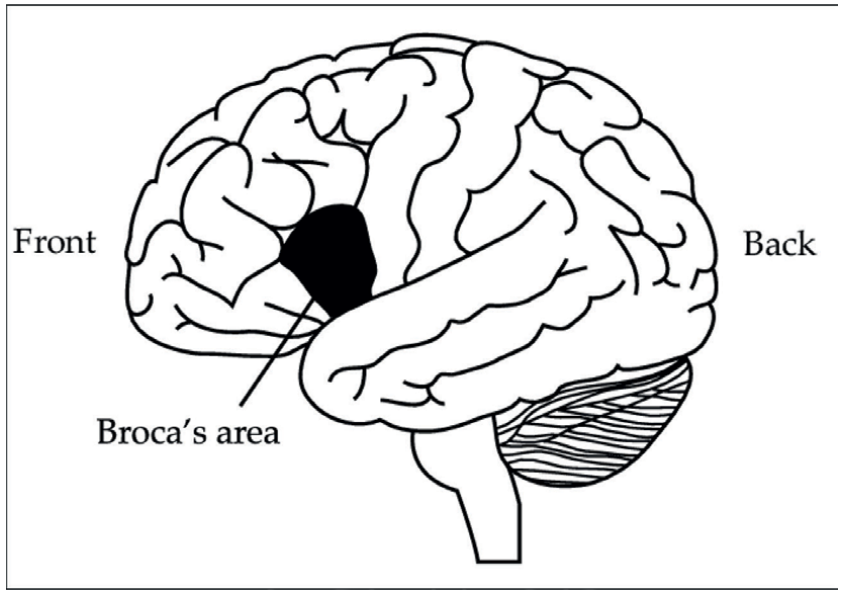

Figure 3.
The location of Broca's area in the brain: responsible for retrieving verbal memory [50].

that moment, they report being blank, and figuratively speaking, it becomes clear that Broca's area, responsible for retrieving verbal memory, is not functioning typically. In those situations, using interventions that solely rely on cognitive processing can pose ethical challenges, risking the potential for pathologising and shaming to occur, as well as the possibility for the therapist becoming de-skilled, presenting further risk for harm [26, 49]. When Broca's area is de-activated, neurobiological research has demonstrated clear association with other limbic areas that are responsible for traumatic dissociation [41], posing another risk for both the client and therapist's safety, as the client could very easily move from an immobile into a mobile state of flight or fight [34].

In hypothesising that depression could be linked to, or a cause of trauma, another important factor to be aware of when delivering psychotherapy, would be a client's tendency to dissociate and slip into a helpless, opioid state, whereby we can no longer reach them, and they cannot hear us [46]. In my clinical experience, this phenomenon happens often with clients that have experienced trauma, and have a tendency to lean towards a depressive lived experience, relying on strategies such as food to induce and maintain an opioid state of being numb and immobile. This is crucial from a point of safety whereby something may be mentioned or triggered in a session that leads to the client freezing. In that moment, it is not effective or appropriate to rely on interventions that necessitate a cognitive action; and the moment to moment, lived experienced of the client must be attended to on a physiological level [34, 35, 50].

5.2 Addressing the physiology in psychotherapy sessions

Van der Kolk [50] and Porges [36] propose an alternative model for situations which necessitate a 'bottom-up' somatic process, as opposed to a 'top-down' cognitive methodology. The crux of these somatic models lays within consideration of the primal responses we function from when our physiology is stuck [33], and as such, offering interventions that enable us to address the dissociation and dysregulation of the client's nervous system

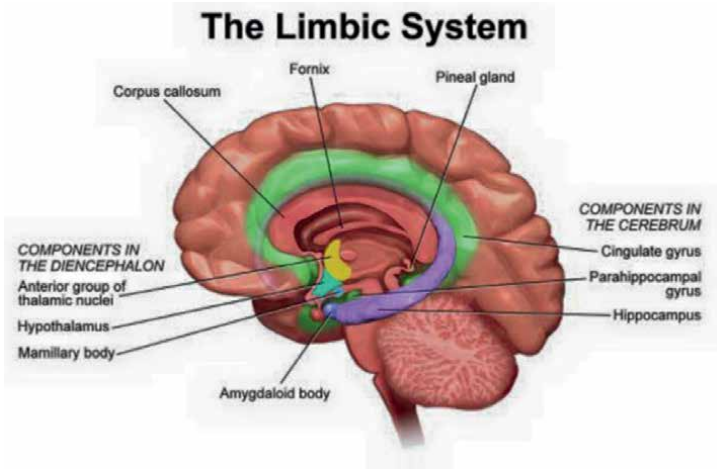

Figure 4.
The limbic brain: responsible for fight, flight, freeze, and the emotion Centre [51].

(see **Figure 4**). Secondly, Porges [36] Polyvagal theory holds salience for embodied, regulated social support when seeking relief from being in one of the three trauma states. Somatic psychotherapy necessitates that practitioners hold a high level of self-awareness in being able to regulate and ground themselves first and foremost, so that they may physically and physiologically hold space for their client. Training in somatic psychotherapies enables this skill, along with interventions such as mindfulness and noticing moment to moment what is happening in both the therapist's and client's body, as opposed to focusing on the words. Noticing the speed at which the client is talking, and encouraging pausing and awareness of the internal and physical experience, offers a bridge back to forming a body-mind connection. Regulating the client's nervous system during sessions has a long-term effect of offering a feeling of safety for them within their bodies, which for some clients is so revolutionary, that they often recall not having *ever* experienced this. Once this safety can be achieved within the body on a physiological level, cognitive functioning improves, and safety can be sought and maintained through interpersonal relationships. Given the biopsychosocial and evolutionary understandings of depression, and the salience for human-connection in order to survive [40] this methodology presents as vastly important in offering the grounding for addressing the basics of being-human, and essentially, offering a new possibility for clients in being able to move fluidly in and out of the necessary depressive states for survival. It removes the likelihood for potential shaming and re-traumatisation within sessions, offering a secure-base of safety, not only intrapersonally, but interpersonally too, within the confines of the therapeutic relationship as is a much researched, necessary condition for *any* psychotherapy to work [52, 53].

5.3 Tension and trauma release exercises (TRE)® for depression

In the 1980's David Berceli [54] created a body work model for a range of natural human responses to stress and trauma that typical talking therapies were falling short in supporting. It was initially designed for use in war and natural disaster zones, but over the years, it has been adapted for use in a wide range of settings. There is a plethora of research that supports the understanding that trauma is not only a psychological experience, but conjoined with, and stored within the body [34, 35, 50]. Consequently, it is vital that people can safely connect to the body and start to process the stored trauma.

Berceli's [54] TRE® is a set of seven exercises that assist the body in releasing deep muscular patterns of stress, tension and trauma that are held in the body. The exercises safely activate a natural reflex mechanism of shaking or vibrating that releases muscular tension, calming down the nervous system. When this muscular shaking/vibrating mechanism is activated in a safe and controlled environment, the body is encouraged to return back to a state of balance.

5.4 The importance of tremoring for general health, emotion regulation and depression

According to Berceli [55], Tremors occur naturally, as a primitive response to highly stressful and traumatic events across the mammalian lifespan, however, due to social and medical trends that pathologise tremoring, humans have largely turned off this processing strategy. Tremors help to relax the muscle tissue and release chronic tension. A fundamental phenomenon which has arisen out of tremor research, is that the tremors can connect the historical and current cognitive aspects (memories and thoughts) to the tremor experience, thus connecting body and mind, and bringing awareness into the embodied present.

Once a person has experienced trauma, they can become fixed and reliant on primitive defence reflexes [33], meaning that environmental information feeds straight into the nervous system and into the limbic brain, inhibiting a fight, flight, or freeze response to all stimuli. In line with Van der Kolk [35]; Berceli [54], postulates that tremoring can help to change emotions, cognitive thoughts, and dialogue that have become immovable, by interrupting the trauma loop. Tremoring helps to interrupt this by breaking the cycle, and beginning to send information into the rational thinking part of the brain (the cortex). Additionally, inducing tremors often can regulate all systems of a person's body, and keep it fairly free from tension, which in turn promotes general well-being. This approach is supportive of what Beck's [17] model of cognitive therapy is seemingly trying to achieve: a prevention for rumination, and changing thinking patterns, in order to alter the feelings and behavioural state. The major difference for TRE® is that this can be achieved in a non-intrusive or shaming way; supporting an inclusive, non-verbal approach, where Broca's area may have shut down, or individual clients are unable to speak or articulate their experiences to inhibit necessary change. It promotes safety and regulation for clients in a gentle, person centred way, where talking therapy is not available or appropriate. Furthermore, it is taught as a self-help tool, thus offering longevity and social inclusion, where other long-term therapies may have high-cost or engagement implications. It also lends itself to both group classes where co-regulation and social connection is sought, as well as the availability for individual sessions.

5.5 Equine and canine assisted psychotherapies for depression

'Dogs are wise. They crawl away into a quiet corner and lick their wounds and do not rejoin the world until they are whole once more' [56]. Christie and Suchet's [56] observation of dogs, speaks to the biopsychosocial concept mentioned above, in attempting to understand why human social systems dictate norms such as consistent, robotic functioning, whilst denigrating rest or illness as weakness [25].

Given the many similarities humans share with mammals, in particular: primates, equines, and canines, (listed in order of most similar limbic brain), it is not unusual to consider the benefits of connecting with them on a non-verbal level for therapeutic

reasons [26]. There are a number of shared social, biological and neurological processes across mammalian species, and not least important of all are the capacities to deal with life threatening scenarios, exhibiting our primal trauma responses [29, 36]. Notably, processes for social attachment and regulation are also very similar, and hence the limbic part of the brain (responsible for fight, flight, freeze, fawn and social engagement) in canines and equines are very similar to humans [57]. With that in mind, we can start to understand a salient basis for recovery from depression. Primarily, animals are fluid and able to move in and out of the depressive state, provided their habitats allow that adaptability, and thus offering a secure-base and modelling for healthy attachment and trauma templates [58].

Based on the literature already presented in this paper, it is postulated that depression is part of the mammalian condition [8, 29]. This therefore offers a non-verbal platform to connect to dogs or horses within a therapy setting (see **Figure 5**). The research has strongly indicated that depression has strong correlations with the human need for connection [36, 45], yet, when stuck in an immobile or opioid state, achieving connection, which Eisenberger [40] argues is vital for survival, is not possible. This suggests that alternative therapeutic interventions that will encourage engagement are needed.

In understanding depression as being a response to, or part of trauma [45]; Van der Kolk [34], offers a neurobiological viewpoint that in order to move a person from trauma to healing requires neural pathways to be restructured, encompassing processes such as neurochemical rebalance, and finding safety through connection [36]. In support of this, literature suggests that neural rewiring can only happen when the individual experiences new responses and activities which soothe and regulate the limbic brain [26]. In conjunction, Lewis et al. [59], propose three stages that will lead to the neurological re-wiring for mammals: (1) limbic resonance, which is where two mammals attune to their internal states whilst sharing empathy; (2) limbic regulation, where two mammals can adapt, soothe and regulate one another's physiology through reading non-verbal emotional cues; and (3) limbic revision,

Figure 5.
A canine assisted psychotherapeutic interaction demonstrating limbic resonance.

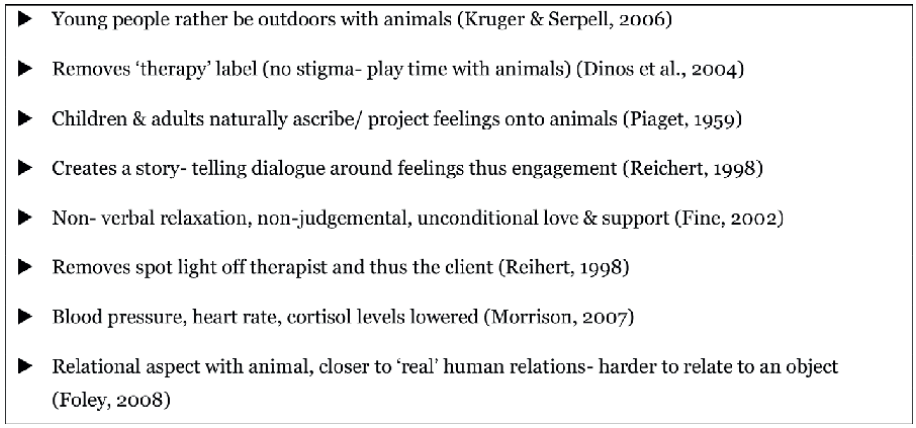

Figure 6.
Benefits of animal assisted psychotherapies [58].

whereby the adaptation over time creates a healthy, or typical template for achieving authentic connection. Based on research such as Foley [58], it can be put forward that AAT would be highly suitable as a biopsychosocial intervention for both trauma and depression (see **Figure 6**).

Animals are fantastic at offering non-verbal reflections of what is happening for us in the moment [60]. They are highly-sensitively attuned to our emotional states, creating another platform for increasing self-awareness and interrupting the immobile states that depression can create [46]. Whilst doing so, they are able to gently interrupt moments of overwhelming emotion and bring awareness back into the moment. This offers a safe space for new patterns of emotion regulation to develop, tools to utilise outside of sessions, and consequently to stop feeling saturated by the overwhelm emotions can sometimes bring [26].

According to Foley [58], animals also bring their own personality and character into the sessions offering space for reflection, companionship, and healing. Sometimes too, they bring laughter and joy, and offer an opportunity for building a relationship that encompasses a person's most vulnerable self. This encourages acceptance of self, and self-compassion to our most vulnerable parts, promoting a model for a fluid position in framing and moving in and out of a depressive state whilst navigating a healthier template for connection (**Figure 7**) [8].

In consideration of the hypothesis for trauma-based neurochemical aetiology for depression, Morrison [61], documents a plethora of health benefits for animal assisted psychotherapies (AAP). Markedly, in view of the literature supporting a correlation between stress and depression, it is widely reported that AAP lowers the stress hormone, cortisol. Corresponding to this heart and breathing rate are also lowered, offering another solution aside to somatic psychotherapy in attending to the physiological aspects, that depression, as a result of trauma, requires [34, 36, 50]. Overall, AAT offers an advantage over other psychotherapies, in particular, due to the non-verbal attachment re-wiring that can take place at the neurological level (e.g., Refs. [34, 59, 60]). Additionally, it is purported that engagement rates are higher than in clinical settings, due to the removal of stigma, and the motivational offering of joy, hanging out with animals can bring. Challenges in accessing AAT may be due to fear or allergy, or a negative past experience, and all except the allergies, may be addressed and included as part of the therapeutic plan [62].

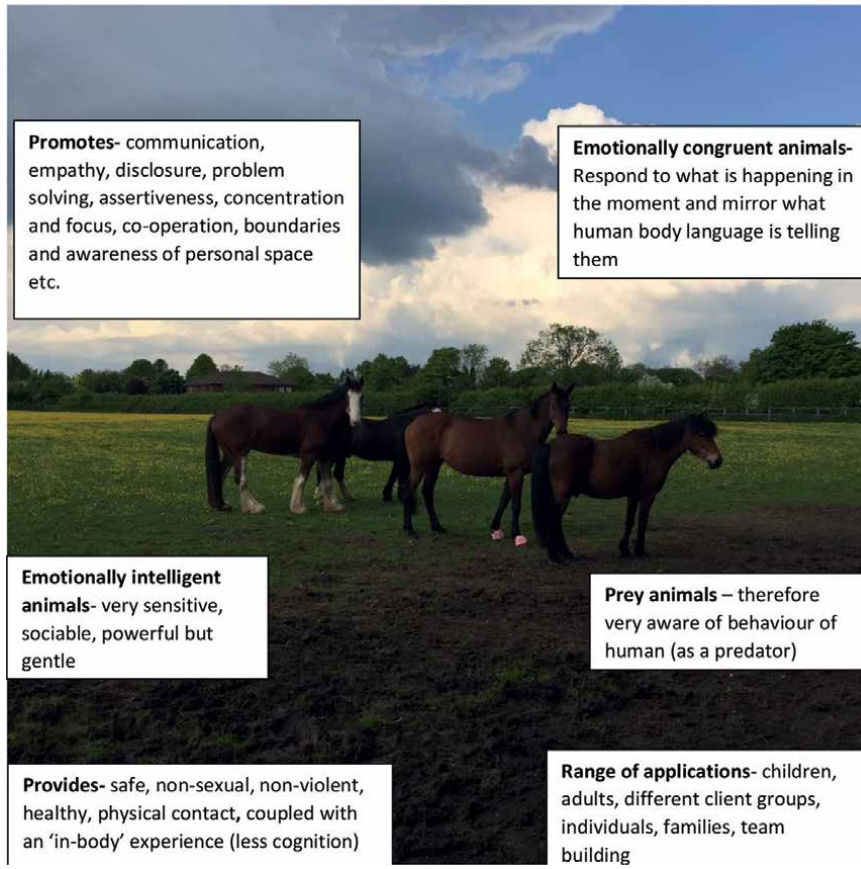

Figure 7.
Benefits of equine facilitated psychotherapy [26].

5.6 Nature assisted psychotherapy for depression

The medical model literature for depression and treatment protocols seems to mimic a parallel process for what people with depression are experiencing in their waking lives; a negative feedback loop, encompassing a maintenance cycle of remaining stuck [12, 46]. Biopsychosocial research for depression offers alternative ways to understand and help, and in doing so, possibilities for embracing our human-ness for fluidly being able to adaptively move in and out of depressive states without getting stuck [8, 20]. Encompassing the latter into a therapeutic intervention authentically, could bring about the necessary connection and change needed to recover when an impasse is reached.

Nature assisted psychotherapy (NP) is described in Williams [49] p. 130 as 'offering a congruent, non-judgemental space for people to recover'. In considering depression as part of the human condition from one of the biopsychosocial perspectives, NP can provide a social constructionist epistemological approach, in understanding that humans are part of nature and its biological systems, and do not exist separately to this. NP resembles much of the humanistic approach to psychotherapy that Rogers [52] understood as fundamental aspects for why a person seeks therapy. Namely, he postulates that we seek therapy when we are in a state of incongruence, which creates an internal conflict causing distress for how we are experiencing life; in other

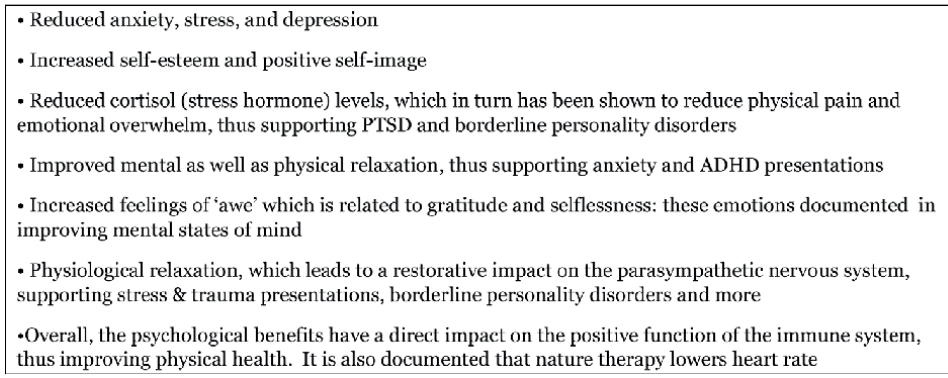

Figure 8.
The benefits of nature assisted psychotherapy [49].

words, causing an imbalance within our lived-experience of the system. Porges [57]; Eisenberger [40]; and Darwin [29] argue that to remain in a state of balance and regulation, it is necessary to maintain healthy social connection. It could further be recognised that these theorists understand human existence from a systemic lens: that we do not exist as separate to others, we are connected intrapersonally to our various bodily systems; our mind is not separate to our body, our physiology not separate to our biology; and we also exist as part of our wider familial, work, school and other social systems. In line with the latter social constructivist worldview, it is also assumed that we are interconnected to nature and its biological and ecological systems. As such, NP offers the opportunity to explore these inter-related connections, and in doing so the relationship we have with ourselves and our environment, making it a good fit for those experiencing depression (see **Figure 8**). From a trauma-informed perspective, it could be argued that the embodied safety that can be achieved through NP, could allow us to extend this safety in connecting with others: a fundamental aspect for being able to move out of depressive states [35, 57].

Aside to the physical and psychological health benefits listed in **Figure 8**. NP also offers the flexibility to integrate other types of psychotherapy into the practice in order to provide a bespoke and individual approach to each person [49]. This humanistic way of approaching client work leaves less room for pathologising, shaming or othering the client [25]. In addition to the broad applications of NP and its appeal to those who may find traditional, clinical settings too stigmatising; NP can also be disseminated in a range of socio-economic and diverse levels, ranging from the psychotherapy room, to community projects, offering an extensive platform for accessibility. Within the process of physically connecting to nature, whether that be through walking or hugging a tree, Van der Kolk's [34] guidance for re-establishing a body-mind connection, can easily be achieved through various grounding exercises, and consequently, offers a solution for connecting to, and processing emotions and trauma that are stored, and or stuck, in the body. Nature further offers a variety of non-verbal exercises that encapsulate an embodied and connected experience. This characteristic presents another way in which practitioners can attend to the client's physiology, and begin the process of regulation and stabilisation; absolutely crucial for clients that are suicidal, or self-harming in any way [63]. NP offers a suitable, flexible, and affordable intervention within a wide range of settings for clients with depression [49]. That said, the ethical and safety implications for working psychotherapeutically in nature should be carefully considered.

6. Conclusion: can we recover from depression?

What exactly does it mean to recover? In line with Hathcoat et al. [64], this question may be addressed and framed depending on the epistemological position and viewpoint for how depression is understood. Importantly, it is the ontological and epistemological positions we take that determine the societal and individual outcomes for health related issues. As previously outlined above, in an individualistic epistemological framework, the medical model understands depression as being a defect within the person, generally negating other biological, environmental or social factors (e.g., [20]). Within this ideology, the person holds a limited and hopeless outlook, and is solely reliant on healthcare systems to 'treat' or change the symptomatology of their internal dis-ease [7]. When conceptualised in this way, research suggests that treatment aligning with the medical model overall is ineffective, thus resulting in an understanding that depression is incurable and a debilitating, life-long illness [12].

It has been proposed that the biopsychosocial viewpoint is an epistemology in its own right [65] however, it would also fit with a social constructivist (sociological theory depicting interactions with others); social constructionist (biological and natural, depicting shared understandings of the world); and humanistic (emphasis on individual and social potential as well as human agency) positions [66]. Within this framework, depression is understood as not only being part of the human condition, normalising symptoms and creating the possibility of fluidity in relation; but in conjunction, offers the option for recovery, since its understanding is, that depression is a temporary state that we can move in and out of in conjunction to the wider systems we are part of [8, 36].

On reflection of the research presented in this paper, it can be agreed between both the medical and biopsychosocial model perspectives, that ACE's, attachment wounds, and trauma, predispose a person to experiencing severe depression across the life-span [5, 46, 67]. With that in mind, the causative factors can be understood as being external and environmental, and something that happened to them, as opposed to *by* them, or solely inside them [8]. Importantly, this purports that psychotherapeutic interventions should include a trauma-informed approach, directed by more than a set of symptoms for depression, which could further be argued, are a set of symptoms for trauma [32, 34, 45, 57, 68]. Future research should explore trauma-informed therapeutic interventions for depression, with a hope to informing policy change for national healthcare systems, that are still reliant on the limited efficacy pharmaceutical and cognitive therapy interventions bring [27, 69].

Conflict of interest

It could be considered a conflict of interest that the author works within nature, canine and animal assisted therapy settings, as well as being a certified TRE® practitioner, with an emphasis on somatic processes within clinical work. Consequently, there may be some bias expressed in the writing.

Notes

None.

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Chapter 6

Diabetes-Related Distress and Associated Factors among People with Type 2 Diabetes in Mekelle City, Tigray Region, Ethiopia

Kalayou K. Berhe

Abstract

Severe emotional distress brought on by diabetes affects one in ten people with type 2 diabetes, one in five people with type 1 diabetes, and one in four people with type 2 diabetes who are using insulin. Therefore, the aim of this study was to determine the prevalence and factors associated with diabetes distress among T2D patients in Tigray region, Ethiopia, An institution-based cross-sectional study was employed on type 2 diabetes patients attending in two hospitals of Tigray. Systematic random sampling technique was used to select the participants. Data were collected using interviewer-administered questionnaire package with PAID Scale. An unpaired t-test was used for continuous variables to compare two groups and binary logistic regression analysis model was used to identify the determinants of diabetes distress. Forty-nine (30.6%) patients showed high diabetes distress. The major predictors were education level [AOR = 5.9; 95% CI: 1.29–27.11, P = 0.022)], Physical activity [AOR = 0.395; 95% CI: 0.16–0.95), P = 0.040] and type of health facility [AOR = 3.2; 95% CI = (1.26, 8.20), P = 0.014]. In conclusion, high diabetes distress was prevalent among T2D patients and lower education level, being physically inactive and attending general hospital contributing as risk factors for high diabetes-related distress.

Keywords: diabetes, distress, type 2, Mekelle City, depression and prevalence

1. Introduction

Diabetes mellitus is a metabolic disorder characterized by hyperglycemia [1]. Type 1 diabetes (T1D) or type 2 diabetes (T2D) are the two broad categories of diabetes, with T2D being the most common [2]. The number of people with diabetes is increasing due to population growth, aging, urbanization, and increasing prevalence of obesity and physical inactivity [3]. Diabetes prevalence in 2021 was globally 10.5% (537 million people). In Africa 4.5% (24 million), and in Ethiopia 4.7% (3 million) [4]. Diabetes is a complex illness that is regarded as being difficult to manage because it involves many restrictive recommendations and the emotional discomfort that diabetic patients experience is an area of developing clinical interest [5].

Mental illness is a prevalent disease among diabetes patients, particularly those with type 2 diabetes [6]. The mental illness common among diabetic patients are depression, anxiety, eating disorders, cognitive dysfunction/ dementia, diabetes-related distress, refusal to initiate insulin therapy, and persistent fear of hypoglycemia [7]. Risk of type 2 diabetes development could be increased by the interplay of biological and psychological factors that contribute to depression [8]. Several evidences suggest diabetes and depression are closely related; diabetic patients are twice more likely to suffer from depression than nondiabetics patients. Depression, however, hinders daily self-management and increases the chance of acquiring diabetes [2].

Depression is a common and serious medical illness that negatively affects how someone feels and the way think and act [9]. Diabetic patients with type 1 and type 2 could have a depression prevalence of three times greater and twice as high, respectively, than the general population globally [10]. Depression can be categorized as a first, recurrent, or chronic episode; it can also range in severity from mild to severe, with or without psychotic symptoms [11].

Major depressive disorders are characterized by prolonged sadness, lack of interest in or enjoyment in activities that the person usually enjoys, and hopelessness coupled with an inability to do everyday tasks for at least 2 weeks [12]. In diabetic patients, the presence of depression and anxiety worsens the prognosis for diabetes and raises noncompliance with medical treatment [13], lowers the standard of living [14], and raise mortality [15]. Similarly, depression has been strongly linked to macrovascular complications such as retinopathy, nephropathy, neuropathy, and sexual dysfunction [16].

The symptoms of diabetes-related distress overlap with several well-known mental health problems, such as depression [17, 18]. Although there are some similarities among diabetes distress and depression, they have different definitions and need for different methods of assessment and treatment. Diabetes distress, in contrast to depression, does not imply psychopathology; it is a normal response to diabetes, whereas depression refers to how people feel about their lives generally [19]. Moreover, diabetes distress is a construct proposed by researchers to describe the emotional response to living with diabetes that requires chronic and demanding self-management. Diabetes distress captures a person's experience with the problems associated with diabetes [20]. Diabetes distress is more common than depression in people with diabetes, despite the fact that depression is more common in this population and may have higher effects on the disease's course [21].

Diabetes distress is an emotional response to living with diabetes, the stress of managing it, and its long-term effects [17–19]. Diabetes distress may also result from the social effects of diabetes (e.g., stigma, discrimination, or others' unhelpful reactions or lack of understanding) [5, 22] and the financial implications of the condition [17, 23]. Diabetes distress can also reach peak at times of heightened general stress, when burden of diabetes self-care becomes too much [24]. Severe emotional discomfort is connected to diabetes and affects one in four patients with type 1 diabetes, one in five patients with type 2 diabetes who are taking insulin, and one in ten patients with type 2 diabetes who are not taking insulin [25]. In one study diabetes distress (DD) was reported by 41% of the participants, and in another study DD was reported by 44.6% of participants [26, 27].

There are significant clinical consequences to untreated emotional distress in diabetes. If left untreated, mild diabetes distress often persists [28] and may develop into severe diabetes-related distress and/or depression [29]. Studies found that diabetes-related distress, but not depression, was significantly related to poorer glycemic control [18, 21]. or through dysregulation of stress hormones [30]. A meta-analysis result

showed that diabetic patients with severe diabetes distress or depression of any severity are less likely to engage in appropriate self-care behaviors and participate in quality care such as annual eye exams and immunizations [31]. Diabetes distress also leads to increased diabetes-related complications and impaired quality of life, affecting physical function, social function, and overall health [32].

Worrying about the future and the potential for serious complications and experiencing feelings of guilt and anxiety when diabetes management goes off track are the most frequently reported problem areas by people with type 1 and type 2 diabetes [33, 34]. Diabetes distress can vary depending on the type of diabetes, even though there are common stressors for all types of diabetes (e.g., type 1 diabetes is more frequently related to insulin treatment and hyper/hypoglycemia; type 2 diabetes is more frequently related to social consequences, food restriction, and obesity) [35]. The management of HbA1c, blood pressure, cholesterol, and overall health can be improved by early detection, routine screening, and the use of evidence-based treatment modalities for depression and diabetes distress. This reduces medical expenses [36].

Many studies have assessed the prevalence of DRD using the DD-17 scale among people with T2DM, but almost all were conducted in developed countries and not in sub-Saharan countries. Additionally, the presence of DRD depends on the characteristics of the study population and other psychosocial factors [37]. Moreover, to the best of our knowledge, there have been no studies conducted in Ethiopia using the PAID scale. Therefore, the purpose of this study was to determine the prevalence and associated factors of diabetes distress among type 2 diabetic patients in Mekelle City, Tigray Region, Northern Ethiopia.

2. Methods

2.1 Study design, setting, and period

A cross-sectional study design was used to conduct a study at the Ayder Comprehensive Specialized Hospital (ACSH) Endocrinology and Diabetes Clinic and Mekelle General Hospital (MGH) Referral Clinic, Mekelle City, Tigray Region, Northern Ethiopia. In 2019, the region reached overall primary healthcare coverage of 96% with a total of 712 health posts, 204 health centers, 20 primary hospitals, 2 specialized referral hospitals and 15 public general hospitals, and there were around 500 health facilities operating in the private sector [38]. These hospitals provide basic health services and manage patients with different diseases including diabetic mellitus. About 3000 patients with diabetes received health services at these general hospitals in 2019. The actual data collection period was from August to December 2021.

2.2 Population

The source population was all adult type 2 diabetic (T2D) patients attending at the diabetes/ referral clinics of public hospitals found in Mekelle City of Tigray, while the study population was all sampled adult T2D patients who were under routine follow-up at Ayder comprehensive specialized and Mekelle general hospitals during the data collection period.

2.3 Sample size and sampling technique

The required sample size (n) was estimated using a STATCALC for population survey via Epi-Info version 7 Software with assumption of a CI of 0.95, a relative precision of 0.05, and the expected proportion of distress among diabetic patients in Vietnam was 12.5% [39]. This provides a sample size of 165; however, a refusal rate was predicted to be 5%, and then the final sample size was 173. The hospitals (ACSH &MGH) were selected purposively, and an equal amount of sample size was allocated. A systematic random sampling procedure was employed to select the participants.

2.4 Eligibility criteria

All T2D patients who were 18 years of age or older, present during the study period and had recent laboratory results were included in the study. Patients with type 1 diabetes (T1D) and those who had untreated hypothyroidism, gestational diabetes, cancer, mental retardation, and psychiatric illness, patients who were severely ill and unwilling to participate, were excluded from the study.

2.5 Variables

Dependent variable was diabetes related distress (DRD) and independent variables ware socio-demographic information (i.e. age, sex, marital status, educational level, occupation, and living arrangement), clinical characteristics (i.e. diabetes treatment, duration of diabetes, FBS and BP), and behavioral factor (confidence in self-management; healthy diet, vegetable consumption, diabetic medication adherence, glucose measured per week, smoking, alcohol consumption and physical exercise).

2.6 Operational definitions

Hypertension is defined as systolic blood pressure (SBP) $\geq$ 140 mmHg and/or diastolic blood pressure (DBP) $\geq$ 90 mmHg [40]. Following a healthy diet means consuming vegetables, fruits; whole grains, protein, low-fat dairy and its products and low simple carbohydrates, fat/oil, avoiding alcohol [41]; high-fat/oil consumption means eating or consuming more than 10% of calories from saturated fat (about more than 20 grams per day) [42]. Alcohol consumption is measured as adults with diabetes who drink alcohol should do so in moderation (>2 for women and > 3 drinks /day for men) [43]. A patient performing moderate to vigorous physical activity for at least 150 min per week was considered as active [44]. For this study, BMI was classified into two categories ($<$ 25 and $\geq$ 25) [45] and controlled fasting blood sugar is fasting blood sugar of $\leq$130 mg/dl [46].

2.7 Data collection instrument and procedure

The data were collected using a pretested interviewer-administered questionnaire through face-to-face interviews and record reviews of recent laboratory tests and

physical examinations. The questionnaire included questions on sociodemographic, clinical, and behavioral characteristics, Perceived Diabetes Self-Management Scale (PDSMS) and problem areas in diabetes scale (PAID). The questionnaire was administered by trained data collectors after the patient consented to participate in the study.

Diabetes Distress (DD) can be assessed using one of several patient-reported outcome measures, those are: Psychological adjustment to diabetes scale (ATT39) [47], Problem Areas in Diabetes Scale (PAID) [48, 49], Questionnaire on Stress in patients with Diabetes-Revised (QSD-R) [50] and the Diabetes Distress Scale DDS (DDS-17) [5, 51]. Of those PAID and DDS are accepted assessment scales because they are statistically sound measures of Diabetes Distress [37].

In this study, we used the PAID scale (20 items) to measure negative emotions related to living with diabetes or diabetes distress, with scores 40 and above indicative of elevated or severe DRD [49, 52]. The 20-item Problem Areas in Diabetes (PAID) scale is a reliable, valid, and psychometrically robust measurement tool with a Cronbach's alpha of 0.95 [48, 53].

The PAID scale's items are focused on various diabetes-related problems (e.g., fear of hypoglycemia or long-term complications and dissatisfaction with family or doctor support; see **Table 1**). The PAID scale assigns a score to each item ranging from 0 ("no problem") to 4 ("serious problem"). A total score of 0 to 100 points is produced by adding up all 20 scores and multiplying the result by 1.25. Higher scores (cutoff ≥40) imply increased diabetes-related distress or high distress [49, 52, 54, 55]. In addition, the 20 items were analyzed separately to rank the problem areas.

Furthermore, Perceived Diabetes Self-Management Scale (PDSMS) (8-item) was used to assess diabetes self-efficacy. The overall PDSMS score can vary from 8 to 40; higher scores indicate person's level of more confidence in managing their diabetes [56]. Behavioral factors were evaluated based on the WHO STEP-wise approach for chronic disease risk factor surveillance [57]. Physical measures were made, and clinical characteristics were gathered from the patient's record. Four Bachelor of Science nurses collected the data with the supervision of two supervisors and a principal investigator.

Variable	Category	High Diabetes		P-value	Non-adjusted	Adjusted
		No, n (%)	Yes, n (%)		COR (95% CI)	AOR (95% CI)
Age group	1. <40 years	8(5.0%)	3(1.9%)		1	1
	2. 41–50 years	29(18.1%)	7(4.4%)	0.581	0.6(0.13, 3.07)	0.7(0.10, 05.87)
	3. 51–60 years	40(25.0%)	18(11.2%)	0.804	1.2(0.28, 5.05)	2.6(0.40, 17.67)
	4. 61–70 years	29(18.1%)	15(9.4%)	0.667	1.3(0.31, 5.97)	1.9(0.23, 16.06)
	5. >60 years	5(3.1%)	6(3.8%)	0.200	3.2(0.54, 18.98)	3.9(0.30, 51.04)
Sex	1. Male	60(37.5%)	22(13.8%)	0.286	0.6(0.35, 1.36)	0.6(0.19, 2.37)
	2. Female	51(31.9%)	27(16.9%)		1	1
Marital Status	1. Married	85(53.1%)	35(21.9%)		1	1
	2. Divorced	10(6.2%)	3(1.9%)	0.645	0.7(0.18, 2.80)	1.2(0.21, 7.13)
	3. Widowed	16(10.0%)	11(6.9%)	0.244	1.6(0.70, 3.95)	0.5(0.12, 2.04)

Variable	Category	High Diabetes		P-value	Non-adjusted	Adjusted
		No, n (%)	Yes, n (%)		COR (95% CI)	AOR (95% CI)
Educational status	1. Illiterate	15(9.4%)	18(11.2%)	0.000	9.3(2.94, 29.73)***	5.933(1.29, 27.11)*
	2. Primary school	38(23.8%)	15(9.4%)	0.046	3.0(1.01, 9.30)*	2.4(0.58, 10.38)
	3. Secondary school	19(11.9%)	11(6.9%)	0.013	4.5(1.37, 14.85)*	4.6(1.08, 19.59)*
	4. College/University	39(24.4%)	5(3.1%)		1	1
Occupation	1. Gov't employee	27(16.9%)	7(4.4%)		1	1
	2. Private work	32(20.0%)	10(6.2%)	0.738	1.2(0.40, 3.59)	0.7(0.18, 3.02)
	3. Retired	16(10.0%)	5(3.1%)	0.779	1.2(0.32, 4.43)	0.9(0.19, 4.42)
	4. Unemployed	36(22.5%)	27(16.9%)	0.032	2.8(1.09, 7.62)*	1.6(0.41, 6.35)
BMI	1. Normal weight	56(35.0%)	31(19.4%)		1	1
	2. Over weight	39(24.4%)	11(6.9%)	0.099	0.5(0.22, 1.13)	0.3(0.10, 1.09)
	3. Obesity	16(10.0%)	7(4.4%)	0.642	0.7(0.29, 2.12)	1.0(0.27, 4.26)
Living arrangement	1. Living with family	104(65.0%)	48(30.0%)		1	1
	2. Living alone	7(4.4%)	1(0.6%)	0.279	0.3(0.03, 2.58)	0.2(0.02, 3.93)
Diabetes treatment regimen	1. Insulin only	29(18.1%)	6(3.8%)		1	1
	2. Insulin & OHA*	9(5.6%)	2(1.2%)	0.937	1.0(0.18, 6.28)	1.6(0.21, 12.93)
	3. OHA*	73(45.6%)	41(25.6%)	0.041	2.7(1.04, 7.08)*	1.9(0.57, 6.63)
Confidence in DMS	1. Less Confident	62(38.8%)	35(21.9%)	0.065	1.9(0.95, 4.07)	2.0(0.78, 5.61)
	2. More Confident	49(30.6%)	14(8.8%)		1	1
Follow Healthy diet	1. Yes	57(35.6%)	30(18.8%)		1	1
	2. No	54(33.8%)	19(11.9%)	0.249	0.6(0.33, 1.32)	0.5(0.20, 1.49)
Alcohol consumption	1. > 3 drinks per occasion	10(6.2%)	14(8.8%)	0.002	4.0(1.64, 9.91)**	2.8(0.94, 8.59)
	2. Never & Once a month	101(63.1%)	35(21.9%)		1	1
Physical exercise	1. Inactive	47(29.4%)	12(7.5%)	0.033	0.4(0.20, 0.93)*	0.395(0.16, 0.95)*
	2. Active	64(40.0%)	37(23.1%)		1	1
Type of institution	1. ACSH	68(42.5%)	12(7.5%)		1	1
	2. MGH	43(26.9%)	37(23.1%)	0.000	4.8(2.29,10.37)***	3.224(1.26, 8.20)*

OHA: Oral Hypoglycemic Agent, DSM: diabetes self-management.*Significant at p < 0.05;Significant at p < 0.01;***Significant at p < 0.0001.*

Table 1.
Socio-demographic characteristics versus diabetes distress among type 2 diabetes (T2D) patients at ACSH and MGH in Tigray region, northern Ethiopia, 2021 (n = 160).

2.8 Data quality assurance

Investigators were provided training about data collection tools and the aim of the study for data collectors and supervisors to ensure data quality. Moreover, the data collection tool was pretested prior to the actual data collection on 5% of the sample size at Quiha General Hospital 2 weeks before the actual data collection period. The necessary amendment was done according to the pretest result. The collected data were examined for completeness and consistency daily at the site during the data collecting period.

2.9 Data analysis

The data were cleaned and checked for completeness and consistency before analysis was started. The data entry was done using Epi-Info version 7 and export to SPSS version 20 for analysis. All continuous data were presented as mean standard deviation (SD), categorical data were described by frequencies, and an unpaired t-test was used for continuous variables to compare two groups. Binary logistic regression analysis model was used to identify risk factors. Hosmer & Lemeshow and Collinearity tests were done to check for model fitness and effect modifiers, respectively. Variables with $p < 0.05$ during the bivariate analysis were then included in the multivariable logistic regression for further analysis. $P < 0.05$ was considered as the cutoff point to declare a variable that shows statistically significant association in multivariable analysis. The strength of the statistical association of factors associated with diabetes distress was demonstrated by computing the adjusted odds ratio (AOR) and 95% confidence interval (CI).

2.10 Ethical consideration

Ethical approval to conduct the research was obtained from the Institutional Review Board (IRB) of Mekelle University. The study was conducted in accordance with the declaration of Helsinki; study participants were recruited voluntarily after obtaining informed consent, and participants were informed of their rights to withdraw from the study at any stage. Information was recorded anonymously, and confidentiality and beneficence were assured throughout the study.

3. Results

3.1 Sociodemographic characteristics of participants

A total of 173 T2D were recruited. Thirteen patients' questionnaires were excluded from data analysis because they did not have sufficient data; hence, the final sample consisted of 160 (92.48%) eligible T2D patients. The majority were aged 40 to 70 years old (86.25%) with mean ± SD age of 56.5 ± 9.6 years (range 32–80 years old), and the mean BMI of the participants was 25.2 ± 3.9 (ranging from 18.5 to 37.1). Most were male (51.2%), married (75.0%), had at least some formal education (79.4%), normal weight (54.4%), unemployed (39.4%), and live with family (95.0%) of which 13.8, 21.9, 19.4, 16.9, 19.4, and 30.0% had high DRD, respectively (**Table 2**).

3.2 Clinical and Behavioral characteristics of participants

Of the total study participants (78.9%) were taking OHA, 80.6%, 72.5%, 51.2%, 68.1%, and 55.6% had a diabetes duration of <10 years, FBG of >130 mg/gl., SBG of <139.99 mmhg, DBP of <89.99 mmhg, and hypertension in which 25.6, 24.3, 21.2, 16.2, 23.8, and 15.6% had high DRD, respectively. Similarly, 57.5, 54.4, 69.4, and 88.1% were more confident in diabetes self-management practices, followed a healthy diet, consumed vegetables <4 servings per week, and adhered to diabetes medication in which 8.8, 18.8, 20.0, and 28.1% had high DRD, respectively. Moreover, 93.1, 95.0,

Variable	Category	High Diabetes		Total
		No, n (%)	Yes, n (%)	
Diabetes treatment regimen	1. Insulin only	29(18.1%)	6(3.8%)	35(21.9%)
	2. Insulin & OHA*	9(5.6%)	2(1.2%)	11(6.9%)
	3. OHA*	73(45.6%)	41(25.6%)	114(71.2%)
Duration of diabetes (years) (7.5 ± 6.2)	1. < 5 years	44(27.5%)	21(13.1%)	65(40.6%)
	2. 5–10 years	46(28.8%)	18(11.2%)	64(40.0%)
	3. > 10 years	21(13.1%)	10(6.2%)	31(19.4%)
*FBG(mg/dl) control (170 ± 58.1)	1. Good (≤130 mg/dl)	29(18.1%)	15(9.4%)	44(27.5%)
	2. Not good (≥131 mg/dl)	82(51.2%)	34(21.2%)	116(72.5%)
*SBP(mmHg) (138.5 ± 20.2)	1. < 139.99 mmHg	56(35.0%)	26(16.2%)	82(51.2%)
	2. > 140.00 mmHg	55(34.4%)	23(14.4%)	78(48.8%)
*DBP(mmHg) (84. ± 9.2)	1. < 89.99 mmHg	71(44.4%)	38(23.8%)	109(68.1%)
	2. > 90–00 mmHg	40(25.0%)	11(6.9%)	51(31.9%)
Hypertension	1. Yes	64(40.0%)	25(15.6%)	89(55.6%)
	2. No	47(29.4%)	24(15.0%)	71(44.4%)
Confidence in self-managing of diabetes	1. Less Confident	62(38.8%)	35(21.9%)	68(42.5%)
	2. More Confident	49(30.6%)	14(8.8%)	92(57.5%)
Follow Healthy diet	1. Yes	57(35.6%)	30(18.8%)	87(54.4%)
	2. No	54(33.8%)	19(11.9%)	73(45.6%)
Vegetable consumption per week	1. <4 servings	79(49.4%)	32(20.0%)	111(69.4%)
	2. > 4 servings	32(20.0%)	17(10.6%)	49(30.6%)
Adherence to diabetic Medication	1. Adhere	96(60.0%)	45(28.1%)	141(88.1%)
	2. Not adhere	15(9.4%)	4(2.5%)	19(11.9%)
Days, in which glucose was measured/wk.	1. Not measured at all	103(64.4%)	46(28.8%)	149(93.1%)
	2. 1–2 days	8(5.0%)	3(1.9%)	11(6.9%)
Ever smoked tobacco products (Smoking)	1. Yes	7(4.4%)	1(0.6%)	8(5.0%)
	2. No	104(65.0%)	48(30.0%)	152(95.0%)
Alcohol consumption	1. > 3 drinks per occasion	10(6.2%)	14(8.8%)	24(15.0%)
	2. Never & Once a month	101(63.1%)	35(21.9%)	136(85.0%)
Physical exercise	1. Inactive	47(29.4%)	12(7.5%)	59(36.9%)
	2. Active	64(40.0%)	37(23.1%)	101(63.1%)

**OHA: Oral Hypoglycemic Agent, SBP: Systolic blood Pressure, DBP: Diastolic blood pressure, FBG: Fasting Blood Glucose.*

Table 2.
Clinical and behavioral characteristics versus diabetes distress among type 2 diabetes (T2D) patients at ACSH and MGH in Tigray region, northern Ethiopia, 2021 (n = 160).

85.0, and 63.1% were measured their blood glucose 1–2 days per week, never smoked, never, or drink once per month, and physically active in which 28.8, 30.0, 21.9, and 23.1% had DRD, respectively (**Table 3**).

Item	All (n = 161)	ACSH (n = 80)	MGH (n = 80)	P-value*
1. Not having clear and concrete goals for your care?	1.6±1.4	1.7±1.5	1.6±1.4	0.598
2. Feeling discouraged with your diabetes treatment plan?	0.7±1.2	0.6±1.2	0.9±1.2	0.255
3. Feeling scared when you think about living with diabetes?	1.0±1.3	0.9±1.3	1.1±1.3	0.415
4. Uncomfortable social situations related to your diabetes care?	0.8±1.2	0.6±1.1	0.9±1.3	0.204
5. Feelings of deprivation regarding food and meals?	1.0±1.2	1.1±1.4	0.8±1.0	0.072
6. Feeling depressed when you think about living with diabetes?	1.4±1.3	1.3±1.2	1.5±1.4	0.251
7. Not knowing if your mood or feelings are related to your diabetes?	1.5±1.4	1.2±1.4	1.8±1.4	0.007
8. Feeling overwhelmed by your diabetes?	1.4±1.3	1.1±1.2	1.7±1.4	0.005
9. Worrying about low blood sugar reactions?	1.6±1.2	1.6±1.2	1.7±1.3	0.539
10. Feeling angry when you think about living with diabetes?	1.2±1.3	0.6±1.1	1.6±1.4	<0.001
11. Feeling constantly concerned about food and eating?	1.4±1.2	1.2±1.2	1.5±1.2	0.189
12. Worrying about the future and the possibility of serious complications?	2.1±1.2	2.1±1.2	2.1±1.2	0.948
13. Feeling of guilt or anxiety when you get off track with your diabetes management?	1.6±1.2	1.7±1.1	1.5±1.2	0.342
14. Not "accepting" your diabetes?	0.7±1.2	0.3±1.0	1.1±1.3	<0.001
15. Feeling dissatisfied with your diabetes physician?	0.8±1.3	0.4±1.0	1.2±1.5	<0.001
16. Feeling that diabetes is taking up too much of your mental and physical energy every day?	2.1±1.3	1.9±1.4	2.3±1.3	0.096
17. Feeling alone with your diabetes?	0.8±1.2	0.5±1.1	1.0±1.3	0.012
18. Feeling that your friends and family are not supportive of your diabetes management efforts?	1.1±1.4	1.0±1.4	1.2±1.3	0.377
19. Coping with complications of diabetes?	2.1±1.2	2.0±1.1	2.2±1.3	0.220
20. Feeling "burned out" by the constant effort needed to manage diabetes?	1.7±1.3	1.4±1.3	2.0±1.3	0.005
Total PAID score (range 0–100)	34.1±15.3	30.2±14.0	38.0±15.7	0.001

**Significant difference of DRD Between participants from ACSH and MGH.*
ACSH: Ayder Comprehensive Specialized hospital, MGH: Mekelle general hospital.

Table 3.
Mean score (range 0–4) of each item of the PAID questionnaire.

3.3 Diabetes distress (DD)

Overall, the average PAID score among the participants was 34.3 ± 15.5 (range 6–85) and 30.6% (49/160) (95% CI: 23.1–37.5) of participants showed high levels of distress with PAID scores ≥40. The items scoring highest were (in descending order): "Feeling diabetes is taking up too much energy every day" (mean PAID score 2.1 ± 1.3), "Worrying about the future and serious complications" (2.1 ± 1.2),

"Feeling 'burned out' by the constant effort needed to manage diabetes (1.7 ± 1.3), not having clear and concrete goals for diabetes care (1.6 + 1.4) and "Worrying about hypoglycemia" (1.6 ± 1.2). The items scoring lowest were: "Feeling discouraged with diabetes treatment plan" (0.7 ± 1.2) and "Not 'accepting' diabetes diagnosis (0.7 ± 1.2). The number of participants with a PAID score ≥ 40 (15.0% vs. 46.0%, p = 0.014) and mean PAID score (30.2 ± 14.0 vs. 38.0 ± 15.7, p = 0.001) were higher among participants from MGH than ACSH (**Table 1**).

3.4 Factors associated with diabetes distress

Binary logistic regression model was used to analyze the data in order to identify factors associated with diabetes distress (DD). In the bivariate analysis, level of

Variable	Category	High Diabetes		Total
		No, n (%)	Yes, n (%)	
Age group (56.5 ± 9.6)	1. <40 years	8(5.0%)	3(1.9%)	11(6.9%)
	2. 41–50 years	29(18.1%)	7(4.4%)	36(22.5%)
	3. 51–60 years	40(25.0%)	18(11.2%)	58(36.2%)
	4. 61–70 years	29(18.1%)	15(9.4%)	44(27.5%)
	5. >71 years	5(3.1%)	6(3.8%)	11(6.9%)
Sex	1. Male	60(37.5%)	22(13.8%)	82(51.2%)
	2. Female	51(31.9%)	27(16.9%)	78(48.8%)
Marital Status	1. Married	85(53.1%)	35(21.9%)	120(75.0%)
	2. Divorced	10(6.2%)	3(1.9%)	13(8.1%)
	3. Widowed	16(10.0%)	11(6.9%)	27(16.9%)
Educational level	1. Illiterate	15(9.4%)	18(11.2%)	33(20.6%)
	2. Primary school (1–8 grade)	38(23.8%)	15(9.4%)	53(33.1%)
	3. Secondary school (9–12 grade)	19(11.9%)	11(6.9%)	30(18.8%)
	4. College/University	39(24.4%)	5(3.1%)	44(27.5%)
Occupation	1. Gov't employee	27(16.9%)	7(4.4%)	34(21.2%)
	2. Private work	32(20.0%)	10(6.2%)	42(26.2%)
	3. Retired	16(10.0%)	5(3.1%)	21(13.1%)
	4. Unemployed	36(22.5%)	27(16.9%)	63(39.4%)
*BMI (25.2± 3.9)	1. Normal weight (18.50–24.99)	56(35.0%)	31(19.4%)	87(54.4%)
	2. Over weight (25.00–29.99)	39(24.4%)	11(6.9%)	50(31.2%)
	3. Obesity (>30.00)	16(10.0%)	7(4.4%)	23(14.4%)
Living arrangement	1. Living with family	104(65.0%)	48(30.0%)	152(95.0%)
	2. Living alone	7(4.4%)	1(0.6%)	8(5.0%)

**BMI: Body Mass Index.*

Table 4.
Multivariate logistic regression of factors associated with DRD among type 2 diabetes (T2D) patients in ACSH and MGH, Tigray region, northern Ethiopia, 2021 (n = 160).

education, occupation, diabetes treatment regimen, alcohol consumption, physical exercise, and type of institution were identified as factors associated with DD at $P < 0.05$. However, age, sex, marital status, BMI, living arrangement, following a healthy diet, and confidence in diabetes management were not significantly associated with DD.

In the multivariate analysis, the odds of having high DD were six times higher in illiterate participants [AOR = 5.9; 95% CI: 1.29–27.11, P = 0.022)] than those who attend university/college level education. The result showed that being physically active decreases the probability of developing high DD by 60.5% [AOR = 0.395; 95% CI: 0.16–0.95), P = 0.040] than their counterpart. Participants who had diabetes care follow-ups at the secondary hospital (MGH) were three times more likely to develop high DD [AOR = 3.2; 95% CI = (1.26, 8.20), P = 0.014] than those who had regular visits at the tertiary hospital (ACSH). However, there were no associations between high PAID score and occupation, diabetes treatment regimen, and alcohol consumption (**Table 4**).

4. Discussion

To the best of our knowledge, this is the first study to use PAID tool in a clinical context to measure the prevalence of diabetes distress (DD) and its associated factors among people with T2D in Mekelle City, Tigray. Our sample consisted of patients attending a secondary or tertiary care outpatient center. Three-forth participants were less than 60 years old, most of them lived with family, were illiterate, and had been diagnosed with T2D more than 5 years before the study. The study showed that approximately one-third of patients with T2D in Mekelle City suffer from DM-related distress.

In this study, the prevalence of DD with PAID scores ≥40 was 30.6% (95% CI: 23.1–37.5), which is in line with figure reported from studies conducted in Nigeria (26.4%), Taif city Saudi Arabia (25.0%), Brazil (31.5%), and Germany (23.8%) [53, 58–60], this is higher than study conducted in Greece (7.4%), Thailand (1.1%), Riyadh-Saudi Arabiya (10.0%), HoChi Mini City, Vietnam (5.8%), Jazan Saudi Arabia (5.0%), Southwest Ethiopia (4.4%), India (18%), and Kuwait (14%) [61–68] but lower than studies conducted in Ghana 44.7% and Thai Bin, Vietnam 50.0% [69, 70].

The variations in population characteristics or assessment tools used in this study may be the cause of the difference in the prevalence of DD. One of the reasons for the lower prevalence reported in other studies compared to ours could be due to differences in the assessment tools, which could potentially affect prevalence. For instance, a study in Greece, Thailand, Riyadh-Saudi Arabiya, Ho Chi Mini City Vietnam, Jazan Saudi Arabia, South west Ethiopia and India (65–71) uses DDS-17, but our study uses a PAID assessment scale.

Another reason for lower prevalence reported in other studies might be due to a difference in diabetes duration of the study populations, e.g., study findings from Saudi Arabia and Vietnam showed that (34.4%) and (29.7%) study populations had diabetes duration of less than 5 years respectively [63, 64], which is lower than the proportion of our study population. Therefore, the higher proportion of participants with longer diabetes duration could be the possible reason for the higher prevalence of DD in our study because diabetes with long duration has been shown to have a psychiatric effect on the patient's quality of life.

However, in contrast to our study, the majority of study population from a study conducted in Ghana (54.7%) [69] and Thai Bin Vietnam (74.8%) [70] were more than

60 years old, thus there was a higher tendency of distress among the older population [71] and differences in sample sizes could also explain the observed lower prevalence in our study.

Moreover, higher prevalence of DD in our study than in Greece and Thailand could be due to difference in study setting. For instance, our study was conducted at secondary and tertiary hospitals but studies from Greece [61] and Thailand [62] were done at primary care (PC) units or centers because the approach of healthcare providers in addressing diabetes psychological issues across the levels of care might vary [72].

This study found that education level ($p = 0.022$), physical exercise ($p = 0.040$), and type of institution ($p = 0.014$) were significantly associated with high diabetes distress. Similarly, previous studies indicated that the risk factor for high diabetes distress scores was low education level [59, 61, 66, 67]. This relationship may be occurred because of low education leading to lack of awareness about diabetes and its complications, which, in turn, increases the risk of poor glycemic control as a result of poor adherence to healthy diet, medication, and fewer health check-ups.

In this study, physically active patients were 60.5% less likely to have high DD than those who were physically inactive; this is in line with studies from other countries [59, 61, 65]. When patients maintain proper glycemic control by adhering to recommended physical exercise and other self-management modalities, they may not develop diabetes-related distress. In this study, subjects who attended a general hospital (MGH) for their diabetes care visit had significantly higher distress scores compared to those who attended a tertiary hospital (ACSH). This is probably related to variations in diabetes care and healthcare providers' approach to addressing diabetes-related psychological issues.

However, age, sex, marital status, occupation, diabetic complications, duration of DM, family support, treatment regimen, and HbA1c level were not significantly associated with diabetes-related distress. The results of the present study are consistent with studies done in other countries, which reported that the total DDS score was not significantly related to patients' age, gender, diabetes duration, marital status, or household income [53, 67, 68]. A study showed that DD is associated with gender, age and duration of diabetes, income, and glycemic status [65]. These findings suggest that other factors may affect DD, e.g., hypoglycemia episode [53, 61, 63], types of diabetes [48, 58], and family support [62, 66].

When interpreting the results of this study, it is important to be aware of the potential limitations; the limitations of this study are: First, because the study relied on participant self-report data, there may be recall bias. Second, the study's cross-sectional design makes it difficult to conclude the cause-and-effect relationship and its direction between DD and independent variables. Third, although we used valid subjective methods to assess DD, clinical objective methods remain the gold standard for diagnosing DD. Lastly, our findings need cautious generalization due to the biases stemming from the relatively small sample size, recall, and social desirability biases.

5. Conclusion

This study showed a high prevalence of high Diabetes Distress (DD) (30.6%) among type 2 diabetes patients in Mekelle City, northern Ethiopia. Education level,

physical activity and study setting (type of health facility) were the risk factors associated to increased prevalence of diabetes-related distress. This implies that DD needs special care from healthcare professionals to prevent and minimize it through integrating psychosocial care with collaborative medical care by combining the evaluation for distress as part of regular procedures into diabetes care in order to increase self-care practices and coping skills. Furthermore, further large-scale studies to identify the causality of DRD are recommended to substantiate our findings.

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Conflict of interest

This manuscript maintains no competing interest of financial, political, personal, religious, ideological, academic, intellectual, commercial, or any other from any person or organization.

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