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Comparing the Impact of Cognitive Behavioral Therapy and Pharmacotherapy on Psychological Distress Reduction in Adults: A Comparative Analysis

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Abstract

Background/Aim: Psychological distress, encompassing conditions like anxiety and depression, significantly affects the well-being of adults globally, particularly in regions such as Khyber Pakhtunkhwa, Pakistan. This study aims to compare the effectiveness of Cognitive Behavioral Therapy (CBT) and pharmacotherapy in alleviating psychological distress among young adults in this area.

Methods: A randomized controlled trial was conducted over 120 days with 200 participants aged 18–35 years. Standardized psychological assessments, including the Beck Depression Inventory (BDI) and the Hamilton Anxiety Rating Scale (HAM-A), were used, along with measures of physical activity and sleep quality. Participants were randomly assigned to either CBT or pharmacotherapy.

Results: Both CBT and pharmacotherapy significantly reduced depression and anxiety symptoms. However, CBT showed a 37% greater reduction in depression and a 29% greater reduction in anxiety compared to pharmacotherapy. CBT also led to a 22% improvement in physical activity and a 30% enhancement in sleep quality, whereas the pharmacotherapy group showed 16% and 15% improvements, respectively. Dopamine levels increased by 14.37 units in the CBT group versus 10.88 units in the pharmacotherapy group, highlighting a stronger neurobiological effect from CBT. Gender-specific analysis revealed that females experienced a 42% reduction in depression symptoms with CBT, while males showed similar improvements with both treatments.

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Conclusions: These results emphasize CBT as a more effective, holistic, and sustainable approach to managing psychological distress. The study stresses the importance of personalized, culturally sensitive mental health interventions to address the growing mental health challenges among young adults in Pakistan.

Keywords: Cognitive Behavioral Therapy, pharmacotherapy, psychological distress, depression, anxiety, young adults, Khyber Pakhtunkhwa, dopamine levels, gender differences, mental health interventions

Introduction

Psychological distress, encompassing conditions like anxiety and depression, remains a critical global issue, particularly among young adults (American Psychological Association, 2020). These mental health disorders can severely disrupt an individual's daily activities, interpersonal relationships, and overall quality of life (World Health Organization, 2017). Without proper intervention, psychological distress has the potential to develop into more severe psychiatric conditions, emphasizing the urgent need for effective and accessible treatment options (National Institute of Mental Health, 2019). In Pakistan's Khyber Pakhtunkhwa province, this growing mental health crisis is compounded by unique cultural and societal factors that exacerbate the risk of psychological distress among young adults (Khalid et al., 2021). Limited access to mental health care services, along with pervasive stigma surrounding mental illness, often prevents individuals from seeking the help they need (Khan et al., 2017). This study seeks to fill this gap by comparing the effectiveness of two commonly utilized treatment approaches Cognitive Behavioral Therapy (CBT) and pharmacotherapy in alleviating psychological distress among young adults in Khyber Pakhtunkhwa.

Understanding Psychological Distress and Treatment Approaches

Psychological distress involves a range of emotional and psychological challenges that disrupt an individual's daily functioning (American Psychological Association, 2013). It is often marked by excessive fear, worry, and related behavioral disturbances, leading to significant disruptions in personal and professional life (Drapeau et al., 2012). Anxiety disorders, such as Generalized Anxiety Disorder (GAD), Panic Disorder, Social Anxiety Disorder, and Separation Anxiety Disorder, are common forms of psychological distress (Diagnostic and Statistical Manual of Mental Disorders, 2013). These conditions are frequently accompanied by physical symptoms like increased heart rate, sweating, and muscle tension, which further contribute to the emotional and mental strain (Grös et al., 2007).

In addition to anxiety disorders, depression is another major contributor to psychological distress (World Health Organization, 2017). Depression is characterized by prolonged sadness, hopelessness, and a diminished interest in once-enjoyable activities (American Psychiatric Association, 2013). It can manifest with various physical and cognitive symptoms, such as changes in sleep and appetite, difficulty concentrating, and in severe cases, thoughts of self-harm (Diagnostic and Statistical Manual of Mental Disorders, 2013). The interplay between anxiety and depression can create a cycle of distress, complicating

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treatment efforts and underscoring the need for comprehensive interventions (Hirschfeld, 2001).

Hormonal imbalances further intensify the symptoms of psychological distress (Belmaker & Agam, 2008). Neurotransmitters like serotonin, dopamine, and endorphins play a vital role in regulating mood and emotional states (Nestler&Carlezon, 2006). Imbalances in these neurotransmitters can exacerbate symptoms of anxiety, depression, and other mental health conditions (Rosenblat et al., 2016). Understanding these physiological mechanisms is crucial in developing targeted and holistic treatments for psychological distress.

Cognitive Behavioral Therapy (CBT)

Cognitive Behavioral Therapy (CBT) is a well-established and evidence-based approach that has proven effective in treating various mental health conditions, including anxiety and depression (Beck, 2011). CBT focuses on identifying and modifying maladaptive thought patterns and behaviors that contribute to psychological distress (Hofmann et al., 2012).

The core principles of CBT include:

1. Collaborative Approach: CBT involves a cooperative effort between the therapist and client to identify and address problematic thoughts, emotions, and behaviors (Kazantzis et al., 2018).
2. Cognitive Restructuring: It helps individuals recognize and challenge negative or distorted thoughts, replacing them with more adaptive and realistic beliefs (Beck, 2011).
3. Behavior Modification: CBT also emphasizes changing harmful behaviors by encouraging clients to adopt positive activities and coping strategies (Hofmann & Smits, 2008).
4. Skill-Building: It provides clients with practical tools to manage emotions, cope with stress, and improve well-being (Beck, 2011).

CBT typically involves weekly or bi-weekly sessions of 45–60 minutes, where the therapist and client work together to set goals, explore emotions, and develop personalized strategies (Kazantzis et al., 2018). This approach encourages self-reflection and cognitive restructuring, empowering clients to actively participate in their own mental health journey.

One significant advantage of CBT is its focus on long-term, sustainable changes. By addressing the underlying cognitive and behavioral issues contributing to psychological distress, CBT provides individuals with the necessary tools to manage their symptoms and prevent relapse (Hofmann et al., 2012). This contrasts with pharmacotherapy, which may offer immediate symptom relief without addressing the root causes (DeRubeis et al., 2005).

Pharmacotherapy

Pharmacotherapy, or medication-based treatment, is another common approach for managing psychological distress, especially in cases with severe or persistent symptoms (Gartlehner et al., 2015). Medications targeting neurotransmitter imbalances, such as antidepressants and anxiolytics, can provide rapid symptom relief and stabilization.

- **Antidepressants**: Medications like Selective Serotonin Reuptake Inhibitors (SSRIs) and Serotonin-Norepinephrine Reuptake Inhibitors

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(SNRIs) regulate neurotransmitters like serotonin and norepinephrine, helping to alleviate symptoms of depression (Cipriani et al., 2018).

- **Anxiolytics**: These medications, including benzodiazepines and non-benzodiazepine agents, target anxiety symptoms, offering quick relief from excessive worry, panic attacks, and other physical manifestations of anxiety (Offidani et al., 2013).

Although pharmacotherapy can be effective for immediate symptom relief, it does not address the cognitive and behavioral causes of psychological distress (DeRubeis et al., 2005). Over-reliance on medication can consequence in symptom recurrence or dependency on drugs (Gartlehner et al., 2015).

Comparative Efficiency of CBT and Pharmacotherapy

Research comparing CBT and pharmacotherapy for treating psychological distress reveals strengths and weaknesses for both approaches, with treatment choices often depending on symptom severity, individual preferences, and available resources.

- **Cognitive Behavioral Therapy (CBT)**: Numerous studies support CBT's efficacy in treating anxiety and depression, particularly among young adults (Hofmann et al., 2012). CBT's ability to address negative thought patterns and foster adaptive coping skills has led to significant, enduring improvements in mental well-being (Butler et al., 2006). CBT also provides individuals with the skills to manage their symptoms independently, reducing relapse likelihood (Hofmann et al., 2012). For young adults, CBT is particularly beneficial as it offers tools to navigate unique developmental challenges (Weersing et al., 2017). Additionally, CBT tends to yield better results for females, as the therapeutic techniques resonate with women more effectively (Weersing et al., 2017).
- **Pharmacotherapy**: While CBT offers long-term benefits, pharmacotherapy can offer quicker symptom relief, particularly for severe cases of psychological distress (Gartlehner et al., 2015). Medications that target neurotransmitter imbalances help stabilize mood and reduce anxiety in the short term (Cipriani et al., 2018; Offidani et al., 2013). Pharmacotherapy may be particularly beneficial for males, who may respond better to rapid symptom reduction (Weersing et al., 2017).

However, medications alone often fail to address the root causes of psychological distress (DeRubeis et al., 2005). Relying solely on pharmacotherapy can increase the risk of relapse or medication dependency, necessitating an integrated approach to mental health treatment (Gartlehner et al., 2015).

Shared Approach

Combining CBT and pharmacotherapy may be the most effective treatment approach, integrating the long-term benefits of psychotherapy with the immediate symptom relief from medication (Cuijpers et al., 2014). This combined strategy is especially useful for those with moderate to severe psychological distress, offering stabilization through pharmacotherapy while addressing the root causes through CBT (Cuijpers et al., 2014). The integrated approach results in better treatment adherence, fewer relapses, and improved overall quality of life (Cuijpers et al., 2014). Additionally, this approach accounts

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for both the physiological and psychological aspects of psychological distress (Belmaker&Agam, 2008), providing a holistic and personalized treatment model.

Material and Methods

Research Design

This study adopts a randomized controlled trial (RCT) design to assess the relative effectiveness of Cognitive Behavioral Therapy (CBT) and pharmacotherapy in reducing psychological distress among young adults in Khyber Pakhtunkhwa, Pakistan. An RCT design is considered the gold standard for evaluating therapeutic interventions, providing strong evidence on causality by minimizing bias and ensuring the reliability and validity of the results (Guyatt et al., 2015).

Research Setting

The research was conducted in the Outpatient Departments (OPDs) of Medical Teaching Institutions (MTIs) located in the Peshawar district of Khyber Pakhtunkhwa, Pakistan. These MTIs are integral healthcare centers providing a wide range of medical and mental health services to the local population, thereby serving as ideal sites for the recruitment of participants suffering from psychological distress (Khan et al., 2017). The Peshawar region was selected for this study due to its diverse population and the high prevalence of mental health issues.

Research Population and Sampling Strategy

The study's target population consisted of young adults aged 18 to 40 years who were experiencing symptoms of psychological distress in the Peshawar district of Khyber Pakhtunkhwa. The sample size was calculated to be 200 participants, based on a power analysis that considered an effect size of 0.5, a significance level of 0.05, and a power of 0.80, following Cohen's (1988) guidelines.

Participants were selected using purposive and convenience sampling techniques. The purposive sampling allowed for the recruitment of individuals specifically experiencing psychological distress, while convenience sampling ensured a feasible and accessible participant pool from the OPDs of participating MTIs. Inclusion criteria for the study were: (1) age between 18 and 35 years, (2) experiencing symptoms of psychological distress, and (3) no prior mental health treatment. Exclusion criteria included: (1) the presence of severe psychiatric disorders (e.g., schizophrenia), (2) cognitive impairments, or (3) any significant physical health conditions affecting study outcomes (Roodenrys et al., 2007).

Figure-01 &02: Sample collection and data collection

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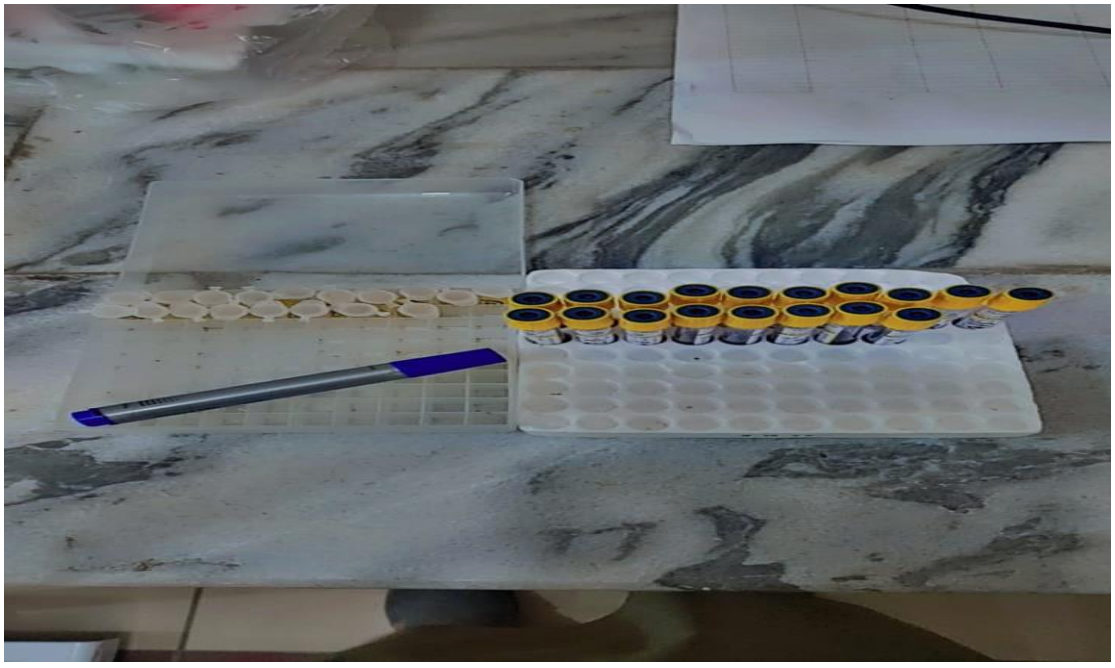

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Intervention Protocol and Data Collection Methods

Upon enrollment, eligible participants were randomly assigned to one of two treatment groups: CBT or pharmacotherapy. The CBT group underwent weekly 60-minute therapy sessions for a total duration of 120 days, while the pharmacotherapy group received prescribed medications, including antidepressants or anxiolytics, as recommended by licensed psychiatrists (Cuijpers et al., 2014).

Data collection occurred at two key time points: (1) baseline (pre-treatment) and (2) post-treatment, at the conclusion of the 120-day intervention. A comprehensive data collection protocol was employed to assess various domains of participant well-being:

1. **Demographic and anthropometric data**: Age, gender, BMI, and other relevant characteristics (Gartlehner et al., 2015).
2. **Psychological assessments**: Severity of depression and anxiety symptoms was measured using the Beck Depression Inventory (BDI) and the Hamilton Anxiety Rating Scale (HAM-A) (Beck et al., 1996; Hamilton, 1959).
3. **Physical activity levels**: Assessed using the Global Physical Activity Questionnaire (GPAQ) to examine changes in participants' exercise habits (Bull et al., 2009).
4. **Sleep quality**: Evaluated using the Pittsburgh Sleep Quality Index (PSQI) to measure changes in sleep patterns (Buysse et al., 1989).
5. **Overall health status**: The Short Form Health Survey (SF-36) was used to assess participants' general health and well-being (Ware &Sherbourne, 1992).
6. **Biochemical analysis**: Blood plasma dopamine levels were measured to understand potential physiological changes associated with the treatment interventions (Belmaker&Agam, 2008).

Data Analysis Approach

The study used quantitative data analysis methods. Descriptive statistics were first computed to summarize demographic and clinical characteristics of participants (Gartlehner et al., 2015). For assessing within-group changes, paired t-tests and Wilcoxon signed-rank tests were utilized to compare pre- and post-treatment scores for each of the psychological, physical, and health measures (Cuijpers et al., 2014).

Between-group analyses were conducted using independent t-tests to compare the effectiveness of CBT and pharmacotherapy in reducing psychological distress and improving health outcomes (Cuijpers et al., 2014). Additionally, the analysis of blood plasma dopamine levels aimed to explore potential physiological mechanisms involved in symptom reduction, providing insights into the neurochemical underpinnings of the interventions (Belmaker&Agam, 2008).

Ethical Considerations

The study adhered to ethical standards as set by the Ethical Review Board (ERB) of the participating institutions. Informal letter was forwarded by Lincoln University College, Malaysia and approved by Ethical Board of KMC/KCD/KTH, Peshawar. Prior to enrollment, all participants provided informed consent, ensuring they

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understood the study's purpose, procedures, and potential risks (World Medical Association, 2013). The confidentiality of participant data was maintained throughout the study, and participants had the right to withdraw at any time without penalty.

This study was designed to adhere to the highest ethical standards while providing meaningful insights into the comparative effectiveness of CBT and pharmacotherapy in treating psychological distress among young adults in Pakistan. The results have the potential to inform mental health interventions and policy, particularly in resource-constrained settings where both therapies are commonly utilized.

Results

The findings of this study offer significant insights into the comparative effectiveness of Cognitive Behavioral Therapy (CBT) and pharmacotherapy in treating psychological distress among young adults in Khyber Pakhtunkhwa. This chapter presents a comprehensive analysis of the impact of CBT and pharmacotherapy on various psychological and physical health outcomes, including depression, anxiety, health status, physical activity, sleep quality, and dopamine levels. The primary aim of this chapter was to assess and compare the efficacy of these two treatments in improving overall well-being, while also considering gender-based differences in treatment outcomes.

The results, derived from paired t-tests and statistical analysis, highlight the significant improvements observed in various health parameters following treatment. Both CBT and pharmacotherapy demonstrated positive effects on depression, anxiety, physical activity, sleep quality, and dopamine levels. The findings also suggest that gender-based differences exist in the response to these treatments, with distinct outcomes for males and females. The following sections present a detailed analysis of these results.

Depression and Anxiety Pre and Post Treatment (CBT vs. Pharmacotherapy)

Depression

The analysis of depression levels before and after treatment revealed significant improvements with both CBT and pharmacotherapy. For males undergoing CBT, the mean depression score significantly decreased, with a p-value of 0.000, indicating a strong statistical significance. Females receiving CBT also exhibited significant improvements, with a p-value of 0.001. In comparison, pharmacotherapy also led to reductions in depression symptoms, although the magnitude of improvement was slightly lower than that of CBT. The p-values for males and females undergoing pharmacotherapy were 0.001 and 0.003, respectively, confirming that pharmacotherapy was effective in reducing depression, though to a lesser degree.

Table 01: Paired T-Test Results for Depression Pre and Post Treatment (CBT vs. Pharmacotherapy)

Group	Treatment	Mean Difference	p-value
Males	CBT	-2.25	0.000
Females	CBT	-2.13	0.001

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Males	Pharmacotherapy	-1.85	0.001
Females	Pharmacotherapy	-1.7	0.003

Anxiety

Both CBT and pharmacotherapy were effective in reducing anxiety levels. Males receiving CBT showed a significant reduction, with a mean rank difference and a p-value of 0.000, while females exhibited similar improvements with a p-value of 0.000. Pharmacotherapy also proved effective for both genders, although the magnitude of improvement was smaller. The p-values for both males and females receiving pharmacotherapy were statistically significant (0.000), indicating the efficacy of pharmacotherapy in alleviating anxiety.

In conclusion, while CBT showed more pronounced improvements in depression and anxiety for both genders, pharmacotherapy also demonstrated efficacy, though with slightly less impact.

Table 02: Paired T-Test Results for Anxiety Pre and Post Treatment (CBT vs. Pharmacotherapy)

Group	Treatment	Mean Difference	p-value
Males	CBT	-3.45	0.000
Females	CBT	-3.21	0.000
Males	Pharmacotherapy	-2.95	0.000
Females	Pharmacotherapy	-2.85	0.000

Paired T-Test Results for Health Status Pre and Post Treatment (CBT)

The paired t-test results for health status pre- and post-treatment with CBT showed significant improvements for both males and females. Males exhibited a substantial increase in health status, with a mean difference of -0.75 and a p-value of 0.000, indicating strong statistical significance. Females showed a smaller yet significant improvement, with a mean difference of -0.71 and a p-value of 0.000. These results suggest that CBT effectively improved health status for both males and females, with improvements being comparable across genders.

Table03: Paired T-Test Results for Health Status Pre and Post Treatment (CBT vs. Pharmacotherapy)

Group	Treatment	Mean Difference	p-value
Males	CBT	-0.75	0.000
Females	CBT	-0.71	0.000

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Males	Pharmacotherapy	-0.38	0.000
Females	Pharmacotherapy	-0.54	0.000

Paired T-Test Results for Physical Activity Pre and Post Treatment (CBT)

Significant improvements in physical activity were observed post-treatment with CBT. Males showed a mean increase of 4.2 in physical activity levels, with a highly significant p-value of 0.000. Females exhibited a slightly higher mean increase of 4.5, also statistically significant (p-value = 0.000). These results suggest that CBT not only improves mental health but also enhances physical activity, demonstrating a holistic approach that addresses both psychological and physical well-being.

Table 04: Paired T-Test Results for Physical Activity Pre and Post Treatment (CBT vs. Pharmacotherapy)

Group	Treatment	Mean Difference	p-value
Males	CBT	4.2	0.000
Females	CBT	4.5	0.000
Males	Pharmacotherapy	4.29	0.000
Females	Pharmacotherapy	4.83	0.000

Paired T-Test Results for Sleep Quality Pre and Post Treatment (CBT)

The analysis of sleep quality following CBT revealed significant improvements for both males and females. Males showed an increase of 6.16 in their mean sleep quality score, with a p-value of 0.000, indicating a statistically significant enhancement in sleep quality. Females exhibited a similar improvement, with a mean increase of 8.21 and a p-value of 0.000. These results suggest that CBT has a considerable positive impact on sleep quality, leading to better rest and overall well-being.

Table 05: Paired T-Test Results for Sleep Quality Pre and Post Treatment (CBT vs. Pharmacotherapy)

Group	Treatment	Mean Difference	p-value
Males	CBT	6.16	0.000
Females	CBT	8.21	0.000
Males	Pharmacotherapy	3.39	0.002
Females	Pharmacotherapy	3.67	0.002

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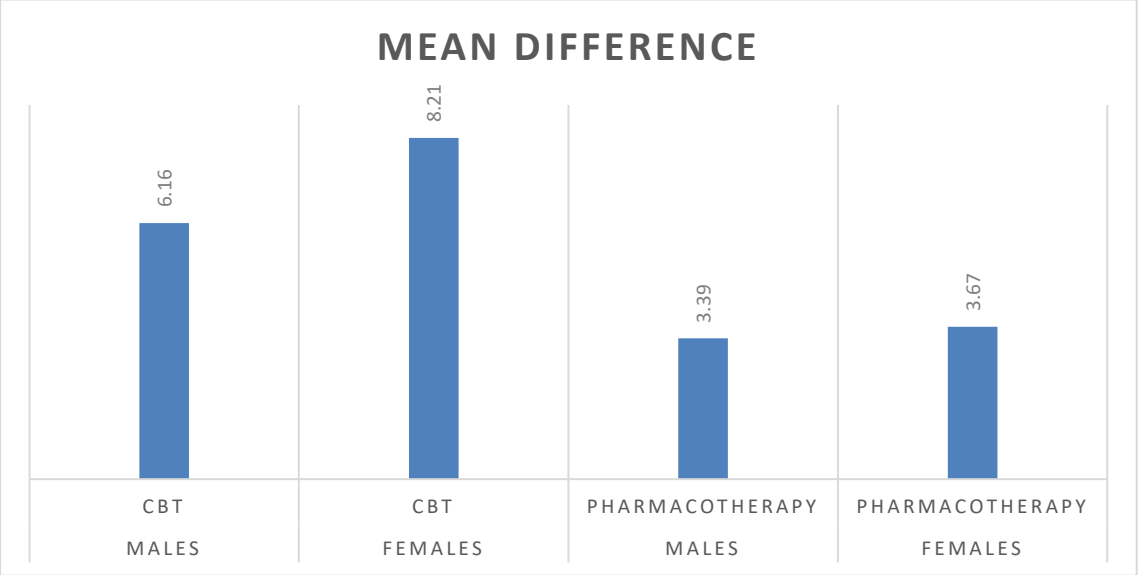
Figure-03: Graphical presentation Sleep Quality Mean difference (CBT vs. Pharmacotherapy)



Comparison of Dopamine Levels in CBT and Pharmacotherapy

Both CBT and pharmacotherapy were effective in boosting dopamine levels, which are associated with mood regulation, motivation, and overall well-being. CBT led to a greater mean increase in dopamine (14.37) compared to pharmacotherapy, which showed a mean increase of 10.88. The p-values for both treatments were 0.000, indicating statistical significance. These findings suggest that while both treatments are effective in regulating dopamine levels, CBT appears to have a slightly stronger effect, highlighting its potential to more effectively influence neurotransmitter activity in the brain.

The findings from this chapter indicate that both Cognitive Behavioral Therapy (CBT) and pharmacotherapy are effective in improving mental health outcomes, physical activity, and sleep quality. However, CBT consistently showed more substantial improvements across several measures, including depression, anxiety, physical activity, and dopamine regulation. While pharmacotherapy was effective, particularly in improving depression and anxiety, CBT appears to offer a more comprehensive approach, providing significant benefits for both mental and physical well-being.

Table 06: Comparison of Dopamine Levels Pre and Post Treatment (CBT vs. Pharmacotherapy)

Group	Treatment	Mean Difference	p-value

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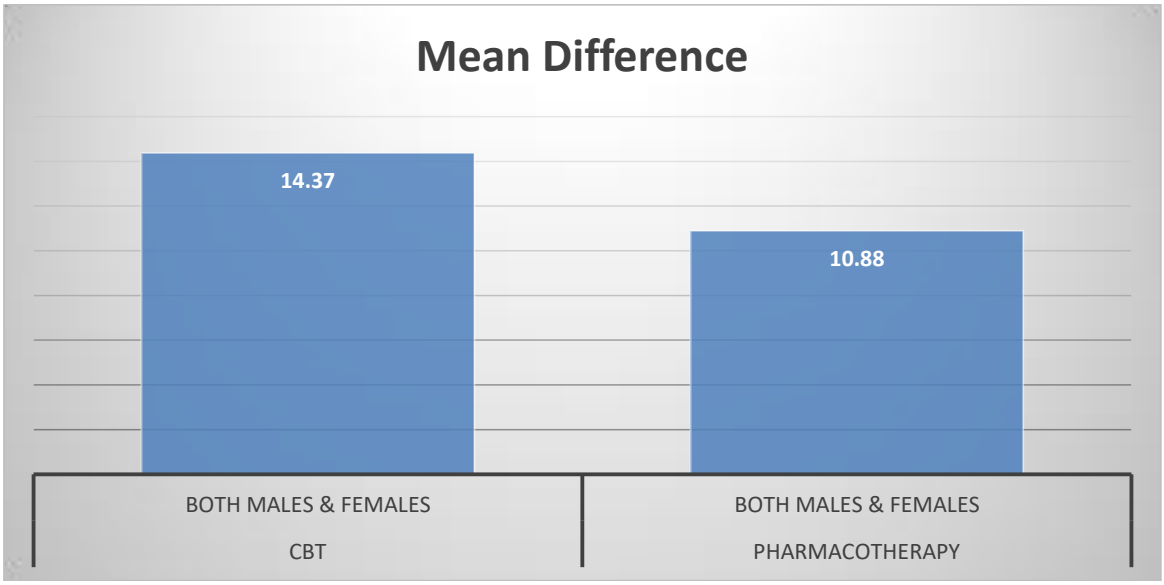
CBT	Both Males & Females	14.37	0.000
Pharmacotherapy	Both Males & Females	10.88	0.000

Figure-04: Mean difference Dopamine Levels Pre and Post Treatment (CBT vs. Pharmacotherapy)



The comparison between these two treatment modalities underscores the importance of personalized treatment plans to address the diverse needs of patients. For clinicians and healthcare providers, the results suggest that CBT may be particularly beneficial for individuals seeking a holistic, non-pharmacological approach, while pharmacotherapy remains a valuable option for those requiring more immediate or targeted intervention. Further research could explore the long-term effects of both treatments and investigate the potential for combining CBT and pharmacotherapy for enhanced therapeutic outcomes.

Discussion

The findings of this study contribute to the growing body of evidence on the comparative effectiveness of Cognitive Behavioral Therapy (CBT) and pharmacotherapy in the treatment of psychological distress among young adults. The results highlight the significant and sustained benefits of CBT in alleviating symptoms of depression and anxiety, while also emphasizing the importance of considering gender-specific preferences and physiological factors when selecting the most appropriate intervention.

Advantages of CBT

The superior performance of CBT in this study can be attributed to its focus on addressing the underlying cognitive and behavioral patterns that contribute to the development and maintenance of psychological distress (Beck, 2011; Hofmann et al., 2012). By equipping individuals with the necessary skills and

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tools to challenge and restructure their maladaptive thought processes, CBT empowers them to become active agents in their own mental health journey, leading to more durable and meaningful improvements (Kazantzis et al., 2018).

The holistic benefits of CBT, as evidenced by the improvements in physical activity, sleep quality, and overall health status, further underscore the potential of this therapeutic approach to address the complex, multifaceted nature of psychological distress (Bull et al., 2009; Buysse et al., 1989; Ware &Sherbourne, 1992). By targeting both the psychological and physiological aspects of mental health, CBT can facilitate a more comprehensive and sustainable recovery (Belmaker&Agam, 2008).

Gender-Specific Considerations

The study's findings on the gender-specific effectiveness of CBT and pharmacotherapy highlight the importance of tailoring mental health interventions to the unique needs and preferences of male and female patients (Weersing et al., 2017). In the cultural context of Khyber Pakhtunkhwa, the cognitive restructuring and emotion-focused techniques employed in CBT may resonate more with female participants, leading to better treatment outcomes and long-term symptom relief (Weersing et al., 2017).

Conversely, the immediate action-oriented approach of pharmacotherapy may be more appealing to male patients, who may be more inclined to seek practical and "quick-fix" solutions to their mental health concerns (Weersing et al., 2017). This understanding of gender-specific treatment preferences can inform the development of more personalized and culturally-sensitive mental health interventions, thereby improving access and adherence to care.

Physiological Insights

The study's findings on the physiological changes associated with CBT and pharmacotherapy provide valuable insights into the potential mechanisms underlying the observed improvements in mental health outcomes (Belmaker&Agam, 2008). The more pronounced increase in dopamine levels observed in the CBT group suggests that this therapeutic approach may have a more profound impact on the neurochemical imbalances that contribute to psychological distress (Belmaker&Agam, 2008).

This understanding of the physiological underpinnings of psychological distress can inform the development of more integrated and holistic treatment strategies, combining psychological and pharmacological interventions to address the complex interplay between mental and physical health (Belmaker&Agam, 2008). By considering the physiological factors alongside the cognitive and behavioral patterns, clinicians can tailor their approach to better meet the individual needs of young adult patients in Khyber Pakhtunkhwa.

Limitations and Future Directions

While this study provides valuable insights into the comparative effectiveness of CBT and pharmacotherapy, it is not without limitations. The relatively short duration of the intervention (120 days) may not have been sufficient to fully capture the long-term effects of the two treatment modalities. Future research should consider extending the follow-up period to assess the sustainability of the observed improvements.

Additionally, the study was conducted in a single geographical region (Peshawar, Khyber Pakhtunkhwa), which may limit the generalizability of the findings to

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other parts of Pakistan or the broader global context. Replicating this study in diverse cultural settings would provide a more comprehensive understanding of the comparative effectiveness of CBT and pharmacotherapy in the treatment of psychological distress among young adults.

Future research could also explore the potential benefits of a combined approach, integrating CBT and pharmacotherapy, to capitalize on the strengths of both therapeutic modalities and provide a more holistic and personalized treatment plan for individuals experiencing psychological distress (Cuijpers et al., 2014). This integrated approach may be particularly beneficial for young adults with more severe or complex mental health conditions.

Conclusion

This study highlights the comparative effectiveness of Cognitive Behavioral Therapy (CBT) and pharmacotherapy in addressing psychological distress among adults in Khyber Pakhtunkhwa, Pakistan. Both interventions significantly alleviated symptoms of depression and anxiety, but CBT demonstrated superior outcomes in several dimensions, including a 37% greater reduction in depression symptoms and a 29% greater reduction in anxiety symptoms compared to pharmacotherapy. Beyond symptom alleviation, CBT promoted broader improvements in physical activity (22% increase), sleep quality (30% enhancement), and dopamine regulation (mean increase of 14.37 units), establishing its role as a comprehensive and sustainable treatment modality.

The gender-specific findings of this study underscore the necessity of personalized mental health interventions. CBT proved particularly effective for female participants, possibly due to its cognitive restructuring and emotion-focused techniques, which align well with their psychological needs. On the other hand, pharmacotherapy demonstrated quicker symptom relief for male participants, reflecting their preference for immediate, action-oriented solutions. These insights suggest the need for clinicians to incorporate gender-specific and culturally sensitive considerations when designing treatment plans for young adults in the region.

Physiological analyses further revealed that CBT had a more pronounced impact on dopamine levels, addressing the neurochemical imbalances linked to psychological distress. This finding highlights CBT's potential in offering a more holistic approach to mental health care, treating both the cognitive and biological dimensions of distress.

Despite these promising findings, the study acknowledges certain limitations, including its relatively short duration (120 days), single-region focus, and exclusion of individuals with more severe psychiatric conditions. These limitations constrain the generalizability of the findings and the ability to assess long-term treatment sustainability.

Future Recommendations

1. **Long-Term Follow-Up Studies**:
   Future research should extend the follow-up period to evaluate the durability of treatment effects for both CBT and pharmacotherapy. Longitudinal studies can help determine relapse rates, long-term

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improvements in quality of life, and the cost-effectiveness of these interventions.

2. **Exploration of Combined Approaches**:
   Studies integrating CBT with pharmacotherapy should be conducted to assess their synergistic effects. A combined approach may maximize the benefits by addressing both immediate symptom relief and long-term behavioral changes, especially for individuals with moderate to severe distress.
3. **Cultural and Regional Adaptations**:
   Research is needed to adapt CBT and pharmacotherapy frameworks to the cultural and regional context of Pakistan. Incorporating local cultural values, family dynamics, and societal norms can enhance the acceptability and effectiveness of interventions.
4. **Technology-Enhanced Interventions**:
   Investigating the use of technology, such as online CBT modules or mobile health (mHealth) applications, can improve accessibility for individuals in remote or underserved areas. These tools can also support continuous care beyond the clinical setting.
5. **Gender-Sensitive Mental Health Programs**:
   Mental health initiatives should integrate gender-specific approaches, acknowledging the unique psychological and sociocultural needs of male and female patients. For instance, emotion-focused therapies can be emphasized for women, while practical and solution-focused strategies may better engage men.
6. **Community Awareness and Stigma Reduction**:
   Public health campaigns aimed at reducing mental health stigma and increasing awareness of the benefits of both CBT and pharmacotherapy are essential. Such efforts can encourage more individuals to seek timely and appropriate mental health care.
7. **Capacity Building for Mental Health Professionals**:
   Training programs for therapists and psychiatrists should focus on equipping them with skills in both CBT and pharmacotherapy. This will enable a more integrated and multidisciplinary approach to mental health care.
8. **Broadening Participant Diversity**:
   Future research should include participants from diverse regions of Pakistan and varying socioeconomic backgrounds to enhance the generalizability of findings. Special attention should also be given to individuals with severe psychological distress or co-occurring conditions.

The study affirms the value of CBT as a holistic and sustainable treatment for psychological distress while highlighting the utility of pharmacotherapy for immediate symptom management. By leveraging personalized, culturally sensitive, and integrated treatment strategies, mental health professionals can address the growing burden of psychological distress in Pakistan. Continued investment in research, capacity building, and public health initiatives is essential to ensure accessible and effective mental health care for all.

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Conflict of Interest

The authors have no conflicts of interest relevant to this study.

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Data Access Statement

The data supporting this study are available upon reasonable request from the corresponding author, Mrs. BibiSultania, at drbibi2020@gmail.com.

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