

# Effectiveness of Progressive Muscle Relaxation in managing Adjustment Disorder among apparel sector employees in Sri Lanka

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**Abstract**— The apparel sector takes place among the largest industries in Sri Lanka, occupying 15% of the country's labour force. The target-oriented nature of the apparel sector often requires employees to work under pressure for extensive hours. Hence, work-related stress is highly prevalent among apparel sector employees, hindering their mental well-being. Adjustment Disorder (AjD) is one such health problem faced by employees in work settings where higher efficiency and productivity are expected within limited time frames. Progressive Muscle Relaxation (PMR), a widely-used tool for the effective management of stress-related disorders, including AjD. However, no studies have been conducted on using PMR to manage AjD in Sri Lanka. Therefore, this study aims at exploring the effectiveness of PMR in managing AjD among apparel sector employees in Sri Lanka. A quasi-experimental design was employed, with 91 participants being allocated to the experimental (n=45) and control group (n=46). The intervention consisted of PMR exercises conducted over 8 weeks. PMR and control groups completed the Adjustment Disorder-New Module 20 (ADNM-20) questionnaire at baseline and after the intervention period. Wilcoxon signed-rank tests revealed that the PMR group elicited a statistically significant decrease in mean ADNM-20 scores from pre-intervention to post-intervention ( $p=0.03$ ), while the control group elicited a significant increase in mean scores ( $p<0.001$ ). The significant reduction in ADNM-20 scores following the intervention in the experimental group demonstrates the efficacy of PMR in managing AjD. Extensive studies are required to assess the practicability of using PMR as the gold standard for treating AjD.

**Keywords**— Apparel sector, Adjustment Disorder, PMR, ADNM-20

## I. INTRODUCTION

Therapeutic intervention is a psychological effort to help individuals to improve their ability to adhere and cope with dynamic instances of life, to benefit from pharmacological treatments and to improve the quality of life. Relaxation practices are therapeutic exercises that support people in reducing their blood pressure, anxiety levels, stress levels and difficulty levels. According to Zelviene and

Kazlauskas (2018), Adjustment Disorder is a stress-related disorder that is rather frequent, especially in several occupational settings (Chirico, 2016), such as the garment sector, which has a substantial workforce and is important to the Sri Lankan economy.

More significantly, AjD can substantially reduce worker productivity (O'Donnell *et al.*, 2019), posing potential health risks that have an immediate negative impact on a country's capacity to develop economically. This paper describes a single segment of a PhD research on the impacts of Progressive Muscle Relaxation (PMR) in managing Adjustment Disorder among apparel sector employees in Sri Lanka.

### A. Therapeutic intervention in counselling

There are several counselling-related therapies provided globally, where by the 1900s psychology and counselling saw the intervention of behaviour therapy through numerous researchers like Ivan Pavlov, B. Watson, Skinner, and others. Additionally, PMR was introduced to physiology by Edmund Jacobson in 1920 and applied in psychology to reduce stress (Mackereth, 2010). Furthermore, in 1950, Albert Ellis established the cognitive therapeutic intervention in counselling. Aron Beck (1960) combined cognitive therapy with behavioral therapy to produce Cognitive Behavioral Therapy (CBT), a type of psychology/counselling (Liu *et al.*, 2020).

Subsequently, when studying the specifics of therapeutic interventions, it is described as it is possible to apply many therapeutic methods in a variety of settings and with various formats. In the psychology setting, the phrase refers to actions or routines that improve another person's mental, social, or emotional health. Counselling sessions might be brief, lengthy, or endless depending on the requirements of the client (Ng *et al.*, 2007). Counsellors establish trustworthy working connections with their clients by being present with them while also paying close attention to and empathetically listening to them (Macdonald *et al.*, 2016). Over time, counselling therapeutic approaches have changed, and they now incorporate a variety of philosophies. Its purpose is to

change a person's mental processes by supporting them in understanding detrimental thought processes and the behaviours that go along with them in stressful situations. It is advised for mild to moderate mental and behavioural issues.

Marsha Linehan created Dialectical Behavioural Therapy (DBT), an emotional intensity-focused talking therapy, based on CBT, in the early 1970s (Eva et al., 2022). It seeks to help people in embracing and understanding their feelings, learn techniques for coping, and attempt to make positive changes. DBT is now the treatment of choice for persons with borderline personality disorder (BPD) due to a lack of knowledge and the fact that it is most frequently employed with women. Simple Relaxation (SR) is a common approach used in therapy to lower stress, anxiety, bloodpressure and discomfort. It can help to create pleasant visions when used with guided imagery and meditation. It has been demonstrated that employing SR therapy is an effective way to treat depression, stress, anxiety, and phobias.

### *B. Progressive Muscle Relaxations*

Progressive muscle relaxation (PMR), a technique developed by Edmund Jacobson for a deep relaxation of muscles in 1920s (Mackereth, 2010), which is particularly impactful in reducing the negative symptoms of depression, stress, and anxiety (Gangadharan, 2018; Kapogiannis et al., 2018; Liu et al., 2020). In research evaluating the effectiveness of PMR and Guided Imagery on the intensity of diabetic peripheral neuropathic pain, exhaustion, and quality of life among type 2 diabetes mellitus patients, both therapies produced favourable effects on the pain (Izgu et al., 2020). Additionally, PMR was proven to be successful in reducing the negative effects of nausea and improving the mental health of cancer patients. In research including men with prostate cancer, PMR was identified to improve the overall health-related quality of life by reducing blood pressure, heart rate, muscular tension, and breathing rate (Isa et al., 2013). PMR has been used to treat AjD in addition to being useful in managing anxiety, depression, sleep disorders, and other behavioural problems and it has been deoicted to be effective in counselling interventions, particularly to reduce anxiety, stress, and depression. Through the use of several strategies, it may be made even more successful in controlling different behavioural problems and reducing anxiety.

### *C. Adjustment Disorder*

Adjustment Disorder (AjD) is a condition characterized by an unhealthy emotional and behavioral reaction to a specific psychosocial stressor. It typically impacts people

who struggle to adjust with the effects of a stressful event in a way that seems more intense or severe than the actual stressor itself (O'Donnell et al., 2019). It is recognized as a stress-related disorder and is the most common psychological disorder in therapeutic settings (Zelviene and Kazlauskas, 2018). Although AjD has been recognized in significant diagnosis symptoms for more than 50 years (Zelviene and Kazlauskas, 2018), the diagnostic criteria for AjD are still unreliable, presenting challenges for mental health providers. Different aetiologies, including both beneficial and detrimental conditions, could lead to AjD. Depending on the importance of the triggering incident and its significance, symptoms could range from moderate to severe.

Healthcare professionals use the 5<sup>th</sup> Edition, Diagnostic and Statistical Manual of Mental Disorders (DSM-5) and the 11<sup>th</sup> Edition, International Classification of Diseases (ICD-11) (World Health Organization, 2018) to diagnose AjD, a Trauma and Stressor-Related Disorder. These classifications are based on exclusion standards and influence therapeutic actions and research. AjD is classified under the ICD-11 and the DSM-5. The first diagnosis was established using DSM criteria, despite similarities as AjD is a psychological disorder.

The DSM classifications' definitions and diagnoses of AjD have gone through some changes; initially, in DSM-1, AjD was referred to as a "transient situational personality disorder," which was later renamed as "transient situational disturbances" in DSM-II (Carta et al., 2009). Following that, DSM-III first used the term "Adjustment Disorder" in the setting of mental health while, DSM-IV expanded on its symptoms. The American Psychiatric Association (2013) (APA) indicates that the DSM-5's most recent edition includes five-point criteria for the diagnosis of adjustment disorder. As a result, an individual may be diagnosed with AjD if they show emotional and behavioural symptoms that are out of proportion to the severity of one or more identifiable stressors and/or show significant changes in several functional areas of life such as social and occupational within three (03) months of experiencing the stressor. Additionally, it states that the symptoms mentioned above must cease within six (06) months after the stressor has passed and that the event related to the stress shouldn't meet the criteria of any other mental disorder or act as an extension for an already existing mental disorder. The DSM-5 includes six (06) subgroups of AjD based on the primary symptoms described. The following includes a list of each subtype's most typical symptoms: subtype-1) AjD with depressive symptoms, subtype-2) AjD with anxious symptoms, subtype-3) AjD with a mix of both depressive and anxious symptoms, subtype-4) AjD with disturbances of conduct, subtype-5) AjD with disturbances of conduct and

emotions, and subtype-6) AjD unspecified, individuals identified as adjustment disorder unspecified have symptoms which doesn't resemble the other types of adjustment disorder.

Every person experiences various stresses at some point during their lifetime. Though most people can deal with stress, AjD symptoms might sometimes occur in some individuals. Instead of interventions that focus on increasing people's inner resources, like PMR research conducted in India (Dehdari et al., 2009), PMR is an effective therapy used to enhance the psychological well-being and to improve the quality of life of the patients. Additionally, PMR has been demonstrated to considerably reduce patients' perceptions of stress and improve their perceptions of their health. The same study (Sheu et al., 2003) revealed that PMR is helpful for patients who have been diagnosed with essential hypertension.

## II. METHODOLOGY

### *Study design*

This study used a quantitative research framework and a quasi-experimental approach with repeated measurements. The current study was conducted at eight (08) factories spread across different areas and run by one of Sri Lanka's top private sector apparel manufacturers.

### *Sampling Method*

The sampling technique used for the study for selection the participants is Purposive sampling.

### *Sample size*

The G\*power analysis performed using the paired sample t-test's standards revealed that 34 participants were the minimum number of participants needed for the research. A total of 53 for the PMR intervention group and 55 participants for the control group with AjD was selected from a thorough screening process. After two-month PMR intervention, the experimental group remained 49 participants, while the control group ended with 46. This was brought about by participants' withdrawal or their inability to finish the necessary intervention sessions.

### *Sample/ Participants*

The study's sample was made up of individuals from middle level management including managers, executives, and team leaders.

### *Inclusion criteria*

Included were the workers who had undergone screening and been given an Adjustment Disorder diagnosis by the counselors. Additionally, the participants were willing to practice the PMR model-related activity components and complete their homework.

### *Exclusion criteria*

Workers who had additional mental health issues, physical impairments, or were taking medication for other disorders were not included in this study. Employees who were dependent on tobacco, alcohol, or other substances were also not allowed to participate.

### *Materials/ Measures*

The participants had an initial AjD screening in order to collect data. For the first screening, DSM-5 and ADN-20 were used. After the PMR intervention, the ADN-20 Questionnaire was applied as a post-test.

### *DSM-5 diagnostic criteria for Adjustment Disorder*

Across the globe, Psychiatrists and Psychologists use the Diagnostic and Statistical Manual of Mental Disorder -5<sup>th</sup> edition (DSM-5), a manual of diagnostic criteria for various mental disorders (American Psychiatric Association, 2013). The manual states that the symptoms will happen from the first 3 months time of the occurrence of the stressor(s) through emotional or behavioural responses to the particular stressor(s) (American Psychiatric Association, 2013). Additionally, these stress-related symptoms shouldn't meet another standard for mental disorders and shouldn't last for more than six (06) months from the removal of the stressor(s).

According to studies, the DSM-5 has a greater level of internal coherence, with a Cronbach Alpha score of over 0.90. Based on the same study's findings (Patra et al., 2013), when DSM-5 was compared to DSM-IV, DSM-5 was shown to have a greater internal coherence. This manual is recognized as a dependable resource to diagnose mental disorders and is appropriate for the diagnosis of Adjustment Disorder in study participants.

### *Adjustment Disorder-New Module -20 Questionnaire (ADNM-20)*

The Adjustment Disorder-New Module 20 Questionnaire (ADNM-20) is a measure of Adjustment Disorder, consisting of two parts: the stressor list and the item list. In the final part, there is a Likert scale used to gauge how frequently individuals experience symptoms of adjustment disorder in the preceding two weeks. The ADNM-20 has various subcategories, including preoccupation, difficulty to adapt, feelings of depression, avoidance, anxiety, and impulsive behaviours (Lorenz et al., 2016). Core symptoms of AjD are considered under these subscales, and the urgency of symptoms is calculated by the total sum score of the items (Lorenz et al., 2016). The Chinese version of the ADNM-20 indicate higher rate of internal consistency (Cronbach's Alpha = 0.93), a reliability coefficient of 0.84, and test-retest reliability of 0.74 (Tang et al., 2020).

A study from Iran demonstrated that the ADN-20 has higher content validity across measures such as Post Traumatic Stress Disorder (PTSD) symptom check, Depression, Anxiety and Stress Scale-21 (DASS-21), and Perceived Stress Scale (PSS) (Reza Sarafraz, 2018). The validation process involved translation, validation, and adaptation following WHO-recommended guidelines (World Health Organization, 2010). The final version was sent to three mental health experts for expert panel review, and the English version was pre-tested upon attestation from all experts.

#### Data collection procedure

The study involved trained counsellors screening employees at eight leading garment factories with adjustment disorder after receiving ethical approval from the General Sir John Kotelawala Defence University review committee. The ADN-20 screening tool and DSM-5 standards were used, and only employees with an adjustment disorder diagnosis were chosen. Informed consent was obtained, and a sociodemographic questionnaire was given. Participants underwent an eight-week PMR intervention after a pre-test examination. The trained volunteer counsellors administered the intervention on-site, and the same subjects were evaluated again using the same scale to determine the severity of their adjustment disorder symptoms. The control group was invigilated parallelly before and after the applying the measurement scales and these individuals had received no intervention during the eight weeks.

#### Data Analysis

The data analysis tool used for the study was the SPSS version 23. Descriptive statistics were presented using frequencies. Non-parametric tests were used for the study to understand the relationship between them, since the study variables were not normally distributed. Hence, the Mann-Whitney U tests and Wilcoxon signed-rank tests were utilized and a significance level ( $p < 0.05$ ) less than or equal to 0.05 was used to identify the statistical significance.

#### Ethical Considerations

Approval for the study was obtained from the Ethics Review Committee of General Sir John Kotelawala Defence University of Sri Lanka. It was made sure that no biasness occurred during the screening process by the age, socioeconomic status, income, ethnicity, religion, or sexual orientation of the participants. The participation of the individuals were voluntary and the informed consent was ensured. Confidentiality was ensured by storing data on a password-protected computer and keeping all data anonymous. Surveys were given a unique identification code to maintain confidentiality. Participants were not expected to experience physical or psychological harm during the study, and if they did, they were referred to

experts for psychological care. Research counsellors assisted in treating control group members, including dropout participants, by referring them to internal counsellors who had completed the same training course. Referral notices were distributed to the participants' experiencing conditions in sealed envelopes.

### III. RESULTS

In total 91 participants were selected at random, 45 participants for the PMR group ( $n = 45$ ) and 46 participants for the control group ( $n = 46$ ). Among them 54.9% ( $n = 50$ ) participants were female, and 45.1% ( $n = 41$ ) participants were male. A majority of 47.3% of the participants were of 26 to 35 years. A higher proportion of the participants were married (48.4%) More than half of the participants (61.5%) had completed GCE A/ls or a diploma (Table 1).

Table 1. Socio-demographic analysis of the participants

Variables	Males		Females		Total	
	n	%	n	%	n	%
<b>Age group</b>						
18-25 years	9	22.0	20	40.0	29	31.9
26-35 years	21	51.2	22	44.0	43	47.3
36-45 years	6	14.6	5	10.0	11	12.1
46-55 years	5	12.2	3	6.0	8	8.8
<b>Marital status</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>
Single	4	9.8	2	4.0	6	6.6
Divorced	15	36.6	26	52.0	41	45.1
Married	22	53.7	22	44.0	44	48.4
<b>Department</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>
Human Resource	1	2.4	2	4.0	3	3.3
Industrial Engineering	3	7.3	1	2.0	4	4.4
Other	8	19.5	12	24.0	20	22.0
Production	21	51.2	27	54.0	48	52.7
Quality Assurance	5	12.2	8	16.0	13	14.3
Stores	3	7.3	2	4.0	3	3.3
<b>Highest educational qualification</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>
GCE O/L	11	26.8	10	20.0	21	23.1
GCE A/L / Diploma	24	58.5	32	64.0	56	61.5
Degree or higher	6	14.6	8	16.0	14	15.4

Source: Author Analysis, 2023

Results of the ADNM-20, DASS-21, GHQ-12 and K10 scales were analysed. Figure 1 shows a comparison of the mean scores between the PMR- intervention group and the control group before and after the intervention period for all the scales used.

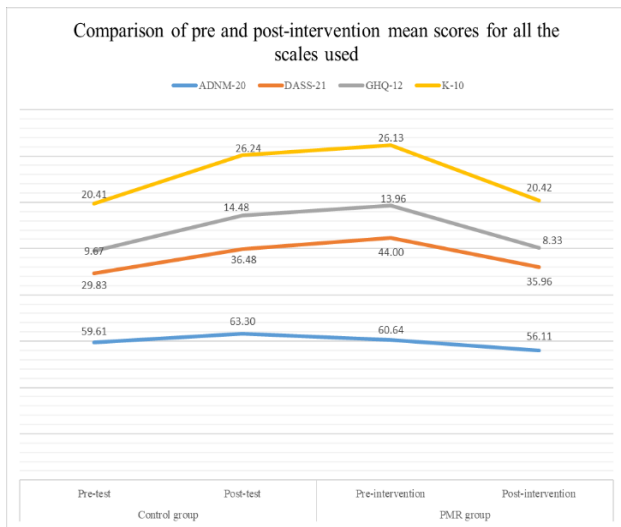


Figure 2. Comparison of the PMR and control groups' mean scores at baseline and following the intervention for all of the used scales. Source: Author Analysis, 2023

Figure 1: Comparison of the PMR and control groups' mean scores at baseline and following the intervention for all of the used scales.

Based on ADNM-20 scores, Wilcoxon-signed rank tests revealed that the control group is statistically significant showing an increase pre and post intervention ( $Z = -3.61$ ,  $p < 0.001$ ), in comparison to the PMR group that indicated a decrease in scores in the post tests ( $Z = -2.15$ ,  $p = 0.03$ ). The DASS-21 scores indicated a reduction in the pre and post tests and is statistically significant for the PMR group ( $Z = -2.11$ ,  $p = 0.03$ ), considered to the control group has an increase post intervention ( $Z = -3.59$ ,  $p < 0.001$ ). Meanwhile, the GHQ-12 scores on the control group is statistically significant while having an increase in the scores since pre to post tests ( $Z = -5.03$ ,  $p < 0.001$ ), whilst the PMR group had a reduction of the scores in the follow-up assessment ( $Z = -3.79$ ,  $p < 0.001$ ). The K10 scores too showed a similar changes in score, whereas a decrease in scores was recorded in the PMR group post intervention ( $Z = -4.108$ ,  $p < 0.001$ ), while an increment was recorded in the controlled group ( $Z = -5.069$ ,  $p < 0.001$ ).

The change in scores from pre-intervention to post-intervention differed significantly between the two groups across all the scales measured. Median scores of the PMR group were of statistical significance compared to those of the controlled group (Table 2). The median ADNM-20 scores in the PMR group (mean rank = 55.70) were statistically significantly higher than the control group

(mean rank = 36.51) ( $p = 0.001$ ). Median DASS-21 score was statistically significantly higher in the PMR group (mean rank = 56.26) than in the control group (mean rank = 35.97),  $p < 0.001$ . The median GHQ-12 scores in the PMR group (mean rank = 63.11) were statistically significantly higher than that of the control group (mean rank = 29.26),  $p < 0.001$ . Finally, the change in K10 scores from pre-intervention to post-intervention was also statistically significant between the PMR and control group, with a mean rank of 63.84 for the PMR group and 28.54 for the control group respectively.

Table 2. Differences in median change in scores from a baseline to post-intervention between the PMR and control group using the Mann-Whitney U-test

SCALE	U	Z	P-VALUE
ADNM-20	1471.5	3.47	0.001
DASS-21	1496.5	3.68	0.000
GHQ-12	1805.0	6.12	0.000
K10	1838.0	6.39	0.000

Source: Author Analysis, 2023

#### IV. DISCUSSION

The present study analysed middle-level management employees in selected apparel sector factories who presented themselves with Adjustment Disorder (AjD) symptoms. They were treated with an eight (08) week PMR intervention program and immediately analysed for AjD symptoms.

This study employed multiple measurement scales to assess the effect of the intervention in the PMR experimental group and the control group. To date, no gold standard exists for the assessment of AjD. Nonetheless, the Adjustment Disorder New Module-20 (ADNM-20) aims to bridge this gap (Lorenz et al., 2016). Therefore, the ADNM-20 scale was selected for the study. The Depression Anxiety Stress Scale (DASS-21) is a well-validated and widely used measure of psychological distress. It provides separate subscales for depression, anxiety, and stress, allowing for a detailed assessment of these constructs, which are symptoms of AjD (Ng et al., 2007). General Health Questionnaire (GHQ-12) and the Kessler Psychological Distress Scale (K10) measure a broad range of psychological distress symptoms such as depression and anxiety. These scales were utilized to complement the results from the first two measurement scales.

To understand the effectiveness of PMR in managing AjD symptoms among selected apparel sector employees in Sri Lanka was the core objective of the paper. A significant reduction in ADN-20, DASS-21, GHQ-12 and K10 scores was seen in the PMR intervention group following the 8-week intervention, as opposed to the control group. The controlled group had showed significant increments in scores across all scales measured after the 8-week period with no therapeutic intervention. The findings of the study reflects with several other studies, such as the research conducted among nurses treating COVID-19 patients by Ganjeali and colleagues (2022), where participants were assessed for stress and anxiety using the DASS-21 scale at baseline and following a 2-week PMR intervention. The findings revealed that significantly reduction was recorded in the scores for stress and anxiety. Similarly a quasi-experimental study carried out in Malaysia in two automotive workshops through a 9-month PMR intervention showed that even by a 10 to 15 minutes of PMR therapy can be effective in decreasing the stress levels perceived at the workplace (Sundram et al, 2016). Merakou and colleagues (2019) had identified that an 8-week PMR intervention together with counselling elicited significant improvements in depression, anxiety and stress symptoms in long-term unemployed citizens in Greece, compared to the control group which received only counselling which also resonates with the current research finding.

This study utilized an 8-week PMR intervention program with 8 therapy sessions, which was found to be effective in alleviating the symptoms of stress, depression, and anxiety among the participants of the study. The study further upgraded on the meta-analysis which suggested that a minimum of 6 PMR therapy sessions were required to observe a favourable health outcome (Van der Klink et al., 2001).

## V. CONCLUSION

Our findings support the advancing body of research suggesting that PMR can be used to significantly alleviate symptoms of AjD and in turn to improve health outcomes, leading to better occupational functioning in the workplace. Future studies should focus on PMR interventions to be implemented other layers of the apparel industry and beyond. Further, the possibilities of using PMR in conjunction with other therapies or counselling services to ascertain the efficacy of the technique as a routine therapy in managing Adjustment Disorder can be explored in future studies.

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