

Research Paper

Effectiveness of Passive Muscular Relaxation and Guided Visual Imagery Psychotherapy on the Management of Cancer Pain

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ABSTRACT

The world is in the process of experimenting, verifying, and exploring the possible breakthrough in the treatment of different types of Cancer. A number of treatment methods are unfolding with their own locked-up merits and demerits (Atlihan-Gundogdu et. al., 2020). The increased rate of cancer all over the world, and the related concerns of cancer patients have become part of the global healthcare discourse, and the management of cancer pain experienced by the patients is one among them. It is not only the physical but also the psychological aspects of the pain which has to be tapped into, in order to find a solution for the same (Katz & Jay, 1984). Passive Muscular Relaxation and Guided Visual Imagery Psychotherapy are two major psychotherapeutic methods that are expected to have a significant impact on the management of cancer pain. The present study thereby tried to quantitatively understand the effectiveness of both these psychological interventions among a group of cancer patients from Kerala with the help of a dependent sample t-test which compared the pain score of patients measured using the McGill Pain Questionnaire before and after the intervention among the experimental and control groups. The study concluded that Passive Muscular Relaxation and Guided Visual Imagery Psychotherapy bring about a major decrease in the cancer pain experienced by patients when they are provided together. It also makes a note that the effectiveness of these psychotherapies does not seem to have an impact in the case of female patients. Limitations and further explanations have been discussed further.

Keywords: *Cancer pain, Guided Visual Imagery Psychotherapy, Passive Muscular Relaxation*

Cancer, the transformation of general body cells of different parts of the body into tumor cells through a number of stages, is found to be the reason for over 10 million deaths across the world according to the reports of WHO (2020). The rapid development of aberrant cells that outgrow their normal bounds and have the ability to infect other body parts and spread to other organs is one of the characteristics of cancer. According to the WHO, the physical, chemical, and biological carcinogens along with the genetic predispositions of people work together to the development of different types of cancers. Cancer is always related to the chronic pain experienced by the affected people to the extent

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that more than 80 percent of the affected people suffer from chronic pain before their death according to study reports (Bruera & Kim, 2003).

A large percentage of cancer patients have the difficult and upsetting symptoms of cancer pain. According to estimates, 30 to 50 percent of cancer patients endure discomfort, which can significantly lower their quality of life (Paice & Ferrell, 2011). It is also said that 25% of cancer patients who have recently been diagnosed, 33% of cancer patients who are actively receiving treatment, and more than 75% of cancer patients with advanced disease have cancer pain and discomfort (Drew et. al., 2014). The complex patterns of treatments used for healing cancer including chemotherapy, radiation therapy, or even bone marrow transplantation in certain cases are difficult to carry out and also have the side effect of developing chronic pain (Fortner et. al., 2002). An estimated 33% of cancer patients who have finished treatment also experience chronic discomfort which is considered to be due to the chemotherapy (e.g., painful peripheral neuropathy), radiation (e.g., radiation-induced brachial plexopathy, chronic pelvic pain secondary to radiation), and surgery (e.g., mastectomy pain, neuropathic intercostal nerve injury after thoracotomy) done among cancer survivors (Everdingen et. al., 2007). Cancer pain management is thereby an area that is being researched intensely by professionals as the major aid that can be provided to everyone with cancer is the management of their experience of pain which could make their lives at least a bit better.

The management of cancer pain frequently involves the use of pharmaceutical therapies, but non-pharmacological interventions, such as psychotherapy, can also be successful. Passive muscle relaxation and guided visual imagery are two psychotherapy approaches that are frequently used to treat psychological distress related to cancer pain (Baider et. al., 1994). Both of these methods work to relieve tension and encourage relaxation in order to assist patients in managing their pain. Different muscle groups all over the body are gradually tensed and subsequently relaxed during passive muscular relaxation. By promoting relaxation and easing muscle tension, this approach tries to lessen the experience of pain (Sloman, 1995). Empirical data supports the application of passive muscular relaxation in high-level tensor responses and mind-body approaches for lowering tension headaches, sleeplessness, cancer adjuvant treatment, chronic pain control in inflammatory arthritis, and IBS (McCallie et. al., 2008). The muscle tension and relaxation exercises are promoted among people experiencing pain and asked to continue on a regular basis throughout their lives. It is a much more economical and effective way of pain management as it can be practiced by people in their own homes without much assistance from others (McCallie et. al., 200).

The goal of guided visual imagery is to use mental images to promote calmness and relaxation. Patients are led through a sequence of visualizations, some of which may involve visualizing a serene setting or healing energy (King, K., 2010). The technique uses a series of steps such as relaxation, setting the scene, engaging the senses, exploring the scene, and returning to reality. Numerous advantages of guided visual imagery have been demonstrated, including an improvement in sleep quality, a reduction in stress and anxiety, and an improvement in general well-being. It can be tailored to meet unique requirements and preferences and can be practiced independently or under the supervision of a qualified practitioner (King, K., 2010). There is some evidence to support the use of guided imagery and passive muscle relaxation in the treatment of cancer pain. According to a study conducted by Lee et. al. (2012), patients with cancer who underwent six sessions of passive

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muscular relaxation experienced much less pain and anxiety than patients in the control group. Similarly, according to Baider et. al. (1994), cancer patients who underwent six guided visual imagery sessions had better pain control and quality of life than those in the control group. Roffe et. al. (2005) also suggested that guided visual imagery can be an effective treatment method for the management of cancer pain.

There have been a number of studies that tried to analyze the effectiveness of both Progressive Muscle Relaxation technique and guided visual imagery in the management of cancer pain and the results have been varying. The reason for the variation was pointed out to be the differences in individual perception of such psychotherapies in the management of physical experiences of pain by the people using these techniques (Kwekkeboom et. al., 2008). Even while some psychological methods or techniques might be effective, not everyone might profit from them equally. The culture and beliefs of people about the psychotherapeutic methods and their effectiveness is also a core concern to be taken care of while understanding the effectiveness of the techniques. The number of Indian studies that focus on the effectiveness of passive relaxation techniques and guided visual imagery in the treatment of cancer pain management is highly limited in the existing research literature and thereby the present study tries to understand the effectiveness of these psychotherapies in cancer pain management in the Indian population.

Need and Significance of the Study

Cancer remains a serious concern among humankind even after the immense development in treatment procedures and increased rate of recovery. Treatments have not been limited to pharmacotherapy and modern medicine but have also focused on psychotherapy to take care of not only the body but also the mind. The pain experienced by cancer patients has been a major concern of the professionals and different ways for its management have been explored which also includes methods like passive relaxation techniques and guided visual imagery. The extent of effectiveness of these methods in the management of cancer pain within localized groups of people living with different cultural beliefs and perceptions is important and the present study tries to focus on South Indian culture. The study is necessary to fill the gap in the literature and also understand the extent to which such psychotherapeutic methods will be effective in the management of cancer pain. By having such a proper understanding, professionals can be mindful of the effectiveness of these methods and try different ways of applying these techniques in order to help cancer patients better as these techniques aim to promote serenity and reduce tension, which might alleviate discomfort.

Objective

The objective of the study is to understand the effectiveness of passive muscular relaxation and guided visual imagery psychotherapy in the management of cancer pain among people belonging to Kerala. The study also tries to explore gender differences in the effectiveness of these methods if any.

Hypotheses

- There will be a significant reduction in cancer pain after providing passive muscular relaxation and guided visual imagery psychotherapy to cancer patients.
- There will be a significant reduction in cancer pain after providing passive muscular relaxation and guided visual imagery psychotherapy among male cancer patients.

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- There will be a significant reduction in cancer pain after providing passive muscular relaxation and guided visual imagery psychotherapy among female cancer patients.

METHODOLOGY

Sample

The population considered for the present study was the people who had been diagnosed with Cancer. The sample consisted of 20 participants with an equal proportion of people making the control group and experimental group for the experimental study. The sampling method used is purposive sampling as cases were selected from Alpha Palliative care, Hospices and link centers, Thrissur district, Kerala, which also provides home visit treatments with the help of multidisciplinary teams for the terminally ill patients. The sample consisted of both male and female participants within the age range of 18-60 years who had been diagnosed with solid tumor/cancer and receiving chemotherapy as part of their treatment. It was also taken into consideration that the participants scored within the range of 15-45 as pain score on SF-MPQ scale (1987) before choosing them as the participants.

Tools

- **A semi-structured proforma:** It was used to collect the demographic details of the participants which included the details of cancer, their treatment details, history of psychiatric illnesses, scenery or place preferences for using guided visual imagery, pre-post pain assessment values, and days of activities.
- **Short Form McGill Pain Questionnaire (SF-MPQ)** - (Tamil, Malayalam, or English version): The scale was used in order to quantitatively analyze the different qualities of pain experienced by the people. It is a short questionnaire with two subscales namely the visual and sensory subscales developed by Ronald Melzack (1987). The scale consists of 15 words in the Pain Rating Index (PRI), 1 item present pain intensity (PPI), and 1 item visual analog scale (VAS). Every item on the PRI scale is rated on a 4-point Likert scale with the scores varying from 0 (none) to 3 (severe). A higher score indicates a higher amount of pain experience. The scale has an internal consistency reliability score ranging between .73 and .89.
- **Audio:** Pre-recorded audio for passive muscular relaxation was provided to the participants in the therapist's voice after proper demonstration of the therapeutic practice for the non-assisted practice days within the treatment period.

Procedure

Participants were informed in detail about the study and asked for their consent before moving forward with the research procedures. The ethical guidelines followed, the concepts of anonymity, confidentiality, and the rights of the participants to withdraw from the research process without giving any explanation were all informed in detail to the participants prior. It was only with the informed consent of the participants the research procedures moved forward. The 20 participants were randomly divided equally into experimental and control groups. The entire details about the physical illness and treatment taken by the participants were collected with the help of semi-structured pro-forma. A pre-therapeutic assessment of pain was carried out over three consecutive days on both the control group and experimental group using SF-MPQ before the initiation of the intervention. After the initial evaluation of pain, interventions of passive muscular relaxation and guided visual imagery were carried out individually for the experimental group which

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lasted for 20 minutes per session. The two initial sessions were carried out on consequent days assisted by the therapist and the next two therapist-assisted sessions were carried out with a gap of 5 days each. Meantime an audio tape with the suggestions in the therapist's voice was given to the experimental group to practice once every day until the next therapist-assisted session. After the completion of the study, the therapist encouraged the client and their family to practice it daily for a better outcome. In the final phase of the study, a post-assessment of the pain of both the experimental and control group was carried out using SF-MPQ. Post-psychotherapeutic intervention sessions were given to all the participants of the control group in five individual sessions and the pre and post reports on SF-MPQ were noted. The pre and post-intervention results were statistically analyzed using SPSS version 25 in order to reach the conclusion regarding the effectiveness of Passive Muscular Relaxation and Guided Visual Imagery Psychotherapy on the management of cancer pain.

RESULTS

The study aimed at understanding the effectiveness of Guided Visual Imagery Psychotherapy and Passive Muscular Relaxation on the management of cancer pain by comparing the self-reported pain experience of cancer patients pre and post-intervention among control and experimental groups. Before understanding the inferential statistical report, it is necessary to understand in detail about the descriptive statistical details of the sample considered for the study. Among all the patients enrolled in both the experimental and control group, the majority of them are diagnosed with thyroid cancer and lung cancer followed by colon cancer, stomach cancer, uterine cancer, anal cancer, and prostate cancer. The other descriptive details of the participants have been mentioned in Table 1.

Table 1: Table representing the percentage and frequency of socio-demographic variables

Group	Statistic	Age(years)		Gender		Education			Cancer stage	
		40-50	51-60	M	F	SE	HS	Grad	III	IV
Experimental group (N=10)	F	5	5	6	4	7	2	1	7	3
	%	50	50	60	40	70	20	10	70	30
Control group (N=10)	F	4	6	7	3	7	3	0	8	2
	%	40	60	70	30	70	30	0	80	20

Note: SE-School education, HS-Higher secondary education, Grad-Graduation

Table 2: Dependent sample t-test showing the difference in pain score in the case of control group and experimental group

Group	Pre-test		Post-test		t(9)	p	r	Cohen's d
	M	SD	M	SD				
Control group	23.3	5.77	23.3	6.66	0.00	1.00	.89**	0
Experimental group	23.3	7.21	14.3	3.86	3.30**	.009	-.12	1.55

** $p < 0.01$, $N = 10$

In order to understand the change in pain score after the administration of the psychotherapies a dependent sample t-test has been conducted and the results are given in Table 2. It is evident from the test results that there is a significant decrease in the mean post-test pain score ($M = 14.3$, $SD = 3.86$) when compared with the mean pre-test pain score ($M = 23.3$, $SD = 7.21$) in the experimental group with a mean difference of 9 units ($t(9) =$

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3.30, $p < 0.01$) while there is no such difference in the control group. The Cohen's d score is found to be 1.55 (> 0.7) which clearly indicates a high effect size.

Table 3: Dependent sample t-test showing the difference in pain score among males and females belonging to the experimental group

Gender	Pre-test		Post-test		N	t	p	r	Cohen's d
	M	SD	M	SD					
Male	24.33	8.47	12.83	3.65	6	2.76	.039*	-.29	1.76
Female	21.75	5.56	16.50	3.41	4	2.45	.091	.64	1.13

In order to understand the role of gender in the effectiveness of passive muscular relaxation and guided visual imagery psychotherapy among cancer patients, independent sample t-tests were conducted separately among the male and female groups of participants. The results of the test is detailed in Table 3 and it shows that there is a significant decrease in the mean post-test pain score ($M = 12.83$, $SD = 36.5$) when compared with the mean pre-test pain score ($M = 24.33$, $SD = 8.47$) in the case of males ($t(5) = 2.76$, $p < 0.05$) while the same difference is not significant in the case of females ($t(3) = 2.45$, $p > 0.05$). The Cohen's d score comes out to be 1.76 (> 0.7) which shows a high effect size. Even though there is a mean difference in the pre and post-test scores of women, the change is found to be insignificant to make a conclusive note on the effectiveness of the different therapeutic methods used as part of the treatment.

DISCUSSION

The importance of psychological aspects of well-being along with physical wellness is a concept accepted beyond doubt by professionals over a very long period of time (Callahan, 1973). The healthcare sector has been focussing on both the mixture of psychological and physical well-being of a person even when the stigma around mental health is still relevant in many parts of the world. India is a country with rich cultural and linguistic diversity and the rate of acceptance of mental illness and mental health is very low (Ganesh, K. N., 2011). Comparative analysis of the rural and urban areas of India has also provided a picture that the rate of acceptance of the importance of mental health is lower among the rural area when compared with the urban belt, but again the extent to which the people belonging to the urban area show health-seeking behaviors becomes a significant question. (Kishore et. al., 2011). To back this idea, the study report of Salve and his colleagues (2013) clearly mentions that the Indian capital city population lacks knowledge of the bio-medical notion of mental illnesses and has a pessimistic, socially constricting, stereotyping, and non-stigmatizing attitude towards mental health concerns.

Cancer and cancer pain management has been one of the core dimensions of the care provided by mental health professionals for terminally ill individuals (Fishman, 1992). The exercise of the biopsychosocial model of healthcare and pain management calls for a wide range of research in all areas of healthcare, including the pharmacological, psychological, and social aspects (Turk et. al., 2011). While focussing on psychological ways, different therapeutic methods such as meaning-centered therapy (Winger et. al., 2020) and mindfulness-based therapies (Day et. al., 2014) have been found to have a significant impact on managing the cancer pain of participants. Behavioral methods such as yoga, exercises, and relaxation techniques have also had an impact on cancer patients and are thereby promoted extensively all over the world. Similarly, the necessity to address anxiety issues, helplessness, hopelessness, and mood fluctuations are all necessary for the psychological

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management of pain (Syrjala, 2014). Among all of these, the impact of relaxation has been related to the effectiveness of auto-suggestion among people as the muscular relaxation is made possible through suggestions given by the therapists which are perceived effectively by the participants and thereby, they consciously let go of the tension within the muscles which can finally lead to the relaxed state that brings down the experience of pain (Schaffer & Yucha, 2004). The perception and interpretation of the incoming pain stimuli can therefore be considered as the core element of the effectiveness of the passive muscular relaxation technique (Montgomery et al., 2013).

Guided visual imagery and passive muscular relaxation are mostly used together as a combination and thereby the impact of both psychotherapeutic interventions has been considered together in the present study. Pain being a sensation that is equally connected with the mind and the body, it becomes important to note the capacity of the patients in both aspects while being concerned with pain management (Hassed, 2013). Passive muscular relaxation carries an amount of physical activity which could initiate the expectation of benefit among the minds of people by default. But at the same time, it would be difficult for the patients to develop a similar expectation of benefit in the case of guided visual imagery if the patients are not clear about the effectiveness of psychological interventions. An aspect of placebo gets evident here (Turner et. al., 2007). The manner in which the participants perceive and expect outcomes from psychotherapeutic methods thereby becomes a core matter of concern (Kwekkeboom et. al., 2008).

By understanding that the perception and interpretation of stimuli are the major elements of effectiveness of both these therapies, it becomes important to consider the cultural backdrop of the patients as the perception, attitude, and interpretation are all dependent on the socio-cultural elements of the participants (Kastanakis & Voyer, 2014). Based on the results of the present study conducted on the cancer patients of Kerala, it becomes evident that the extent of effectiveness of these psychotherapeutic methods in the treatment of cancer pain is clearly heading in the positive direction. The significant reduction in the experience of cancer pain in the post-therapeutic period gives clear evidence that the use of passive muscular relaxation and guided visual imagery psychotherapy are effective in managing cancer pain among the cancer patients of Kerala. But at the same time, it is necessary to note that the effectiveness of these methods among the female group of cancer patients came out to be statistically insignificant, which opens the space for a critical analysis of the understanding. It is evident that a generalization cannot be made out of the results.

The possibility for the insignificance could be related in one way with the same concerns of lack of trust and acceptance towards psychological aspects of treatment. The cultural beliefs, stereotypes, lack of knowledge, and awareness about mental health care can be the perpetuating factors (Bhargava et. al., 2017). A different explanation can be made through the findings of Carey and Burish (1988) who suggest that behavioral interventions cannot be beneficial among patients who are severely affected by cancer and carry high amounts of distress (Carey and Burish, 1988). But at the same time, there have been studies in the literature which oppose these suggestions with proper evidence (Baider et. al., 1994). The effectiveness of Guided visual imagery psychotherapy and Progressive muscular relaxation in the management of cancer pain is seen to be a matter beyond doubt. Developing an internal locus of control among the clients, and proper awareness about mental health and the effectiveness of psychotherapeutics thereby becomes the major focal point to work further on in order to help the patients to manage their cancer pain better. Further research

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works should be done in such a direction so that the insignificant result received from the women population can be explained with clarity along with a proper solution. As the present study has been conducted on a smaller sample size, it could have also influenced the results of the study. Working on a larger population would give a clearer picture and the need for spreading awareness about mental health concerns and effectiveness of psychological treatment methods could be focused then.

CONCLUSION

The study concluded that passive muscular relaxation and guided visual imagery psychotherapy are effective in reducing the experience of cancer pain among patients with different types of cancer among the Keralites. It also points out that these psychotherapies are significantly effective in the case of male patients while the case with female patients is unclear.

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Conflict of Interest

The author declared no conflict of interest.

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