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RESEARCH ARTICLE

THE EFFECTIVENESS OF VIDEO-BASED EDUCATIONAL INTERVENTION REGARDING SELF-MANAGEMENT OF COMMON SIDE EFFECTS OF EXTERNAL RADIATION THERAPY AMONG THE PATIENTS OF HEAD AND NECK CANCER UNDERGOING EXTERNAL RADIATION THERAPY IN MIZORAM

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Abstract

Patients receiving external radiation therapy for head and neck cancer frequently encounter preventable or manageable side effects that impact their daily functioning. Video based educational interventionma y serve as a practical tool to enhance patients' knowledge and self-management practices. An evaluative study was conducted to assess the effectiveness of video-based educational intervention on knowledge regarding self management of common side effects of external radiatio n therapy on head and neck cancer patients receiving external radiation therapy at Mizoram State Cancer Institute (MSCI). The main aim of the study is to find effectiveness of video-based educational intervention on self-management of common side-effects on head and neck cancer patients. A pre-experimental one group pre-test post-test design was adopted for the study. The data was collected from 30 head and neck cancer patients receiving external radiation therapy by using purposive sampling technique. The result showed that the mean (17.06) and median (17) of post-test knowledge scores were higher than mean (10.26) and median (11.5) of pre-test knowledge scores. The computed paired 't' test value ('t'_{29}=11.37) was statistically significant at 0.05 level of significance. The present study reveals that video-based educational intervention was effective in improving the knowledge among head and neck cancer patients receiving external radiation therapy.

Introduction:-

Cancer is a significant public health problem owing to its high incidence and prevalence in all regions of the world.Head and neck cancer represents a significant global health concern, with a notably high incidence in certain regions of India, including Mizoram.In India, head and neck cancer is a major health problem, head and neck cancer accounted for about 26% of all cancer cases in males and about 8% in females. The risk for developing head and

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neck cancer in India was 1 in 33 for males and 1 in 107 for females and the population-based cancer registries reported the highest incidence rate of head and neck cancer in the north eastern region of India (Bagal et.al., 2023). The cross-sectional study spanning a period of 18 years (2003 to 2020) witness an upward trend in cancer incidence and mortality in Mizoram. The head and neck cancer are ranked as the second most common type of cancer among male in Mizoram. (Zomawia et al., 2023) The head and neck cancer patients usually receive a combined modality treatment approach that includes one or more of the following treatments: surgery, radiation therapy, chemotherapy and targeted therapies. Radiation Therapy has been used successfully alone for early-stage cancer (T1, T2) and for cases when resection is not advisable. To reduce the risk of local regional failure and to improve survival in head and neck cancer patients, post-operative or adjuvant radiation therapy is usually given. Radiation Therapy followed by surgery is the combined treatment of choice for locally advanced tumor (T3, T4) and for patients at high risk of local recurrence (Yarbro et al., 2018).

Radiation therapy uses high-energy particles or waves, such as protons, electron beams, gamma rays, or x-rays, to kill or damage cancer cells. Cancer cells are killed when radiation breaks their DNA, preventing them from proliferating and reproducing. Even though the targeted cells are cancer cells, the nearby healthy cells surrounding the cancer cells are also destroyed by radiation causing side-effects on the cancer patients receiving radiation therapy. Early side-effects can be managed within weeks or months but might impact the continuity of treatment in a person. Many of the late side-effects can have long term impact on a patient and have a negative effect on the quality of life of patient receiving radiation therapy. (Strojan et al., 2017)These side effects can be overwhelming for patients and, if not properly addressed, may even result in treatment delays or stopping therapy altogether. Helping patients manage these symptoms effectively is essential for better outcomes and ensuring the success of their treatment. Since cancer survivors—particularly those who have undergone radiation therapy—often require long-term support, there is a strong need for a comprehensive and holistic educational program that includes guidance on managing radiation-related side effects (Prembroke et al., 2019)

Advancements in cancer treatment have resulted in improved survival rates and the reclassification of cancer as a chronic condition. Consequently, cancer care has shifted toward shorter hospital stays, increased use of ambulatory services, and greater reliance on home-based care. To adapt to this transition, patients must be supported and empowered to manage their health independently, as they are responsible for their own care around the clock. Self-care therefore becomes an essential approach for delivering individualized, high-quality care to people living with cancer (Howell et al., 2020). In addition, in the case of head and neck cancer patients who are receiving external radiation therapy for their treatment, the visible side-effects of radiation therapy in their head and neck region create a significant psychological burden and increase their need and demand for information (Fitchett et al., 2018).Technology based educational intervention like educational video which are made according to their health literacy are easily accessible for patients to receive standardized cancer information. In a resource-limited situations, where comprehensive patient education is not possible, cancer educational videos are a low-cost tool for educating and empowering patients (Tilly et.al., 2022). Educational videos have a significant influence on patients by boosting knowledge, understanding, and making informed treatment decisions, reducing stress and improve coping abilities, enhancing self-care behaviors, and optimizing psychological well-being (Kumar et al., 2021). Existing research on the importance of providing cancer-related information, patients' strong need for such information, the consequences of inadequate guidance, and the effectiveness of video-based educational interventions in improving knowledge retention and influencing behavior has emphasized the necessity of this study.

Materials and Methods:-

In this evaluative study, Janet W. Kenny's open system model was used for framing conceptual framework in order to assess the effectiveness of video based educational intervention on knowledge of head and neck cancer patients receiving external radiation therapy regarding the self-management of common side-effects of external radiation therapy. This study employed a pre-experimental one-group pre-test–post-test design and was carried out at the Mizoram State Cancer Institute (MSCI), Zemabawk, Mizoram—the only facility in the state that provides radiation therapy services. The research involved patients with head and neck cancer undergoing external radiation therapy at MSCI. A purposive sampling technique was used to select participants, and the final sample consisted of 30 head and neck cancer patients receiving external radiation therapy.

Tools for data collection:

The following tools were used in this study:

Tool 1 - Section A: Demographic proforma, Section B: Clinical proforma

Tool 2: Structured knowledge questionnaire
The structured knowledge questionnaire was made with multiple choice questions. The multiple-choice items had four (4) options with one correct answer. For every correct response a score of one (1) mark was given and a score of zero (0) mark for incorrect response.

Content validity and reliability of the tool:-
To evaluate content validity, the draft tool and its criteria checklist were reviewed by nine experts in the English version and five experts in the Mizo version, with 80–100% agreement across all items. The tool was translated into Mizo and then back-translated into English by qualified language experts to ensure accuracy. Reliability was assessed using the split-half method, and the coefficient calculated through the Spearman–Brown Prophecy formula yielded an 'r' value of 0.95, indicating that the tool was highly reliable.

Development of educational video for video-based educational intervention:-
This study aimed to improve knowledge of head and neck cancer patients on self-management of common side-effects of external radiation therapy. So, an educational video on self-management of common side-effects of external radiation therapy was developed. The content of educational video was prepared after reviewing available research and non-research literature. The draft content of the educational video and the educational video, along with a criteria checklist, was submitted to nine experts for evaluation. They were asked to assess the relevance, adequacy, and appropriateness of the material using options for agreement, partial agreement, or disagreement, with space provided for suggestions. All experts showed 100% agreement across the content, with minor recommendations such as emphasizing the importance of maintaining confidentiality for images and video clips included in the educational video to ensure ethical standards. The translated Mizo version of the content along with educational video was also reviewed by five experts, who likewise demonstrated full agreement. Based on their feedback, certain items were revised and reorganized to enhance clarity and simplicity. To further improve the effectiveness of the educational video, Mizo subtitles were added.

Ethical considerations:-
Ethical clearance for the study was obtained from the Institutional Ethics Committee of the Regional Institute of Paramedical and Nursing Sciences (RIPANS), administrative approval from the Director of Health and Medical Education, Directorate of Health and Family Welfare, Government of Mizoram to conduct the study at Mizoram State Cancer Institute (MSCI), Zemabawk was also obtained. Written informed consent was obtained from all participants, and strict confidentiality and anonymity were maintained throughout the research process.

Data collection procedure:-
On the first day, a pre-test was conducted using a self-administered structured knowledge questionnaire to evaluate head and neck cancer patients' knowledge of self-managing common side effects of external radiation therapy. Participants then viewed a 16-minute educational video within the research setting on the same day. On the eighth day, the post-test was administered using the same structured knowledge questionnaire.The datas collected through the structured knowledge questionnaire were analyzed in accordance with the study objectives and hypotheses using both descriptive and inferential statistical methods.

Results:-

Section I: Description of sample characteristics:-
The sample characteristics were divided into two parts, one part related to the demographic information of the patient and the other related to the clinical profile of the patient. Descriptive statistics like frequency and percentage distribution was computed for description of sample characteristics.

Part A: Description of demographic information of the patient:-
The Demographic Variables of the head and neck cancer patients receiving external radiation therapy are described in terms of Age in years, Gender, Marital status, Educational qualification and Area of residence.Frequency and percentage distribution were computed for describing the demographic variables and characteristics as shown in table 1.1

Table 1.1 Frequency and percentage distribution of head and neck cancer patient according to their demographic variables n = 30

Sl.No	Characteristics	Frequency (f)	Percentage (%)
1.	**Age in years**		
	18-30	0	0
	31-40	3	10
	41-50	**9**	**30**
	51-60	**9**	**30**
	61 and above	**9**	**30**
2.	**Gender**		
	Male	**25**	**83.3**
	Female	5	16.7
	Others	0	0
3.	**Marital status**		
	Single	2	6.7
	Married	**20**	**66.6**
	Widowed	6	20
	Divorced	2	6.7
4.	**Educational qualification**		
	Post Graduate and above	0	0
	Graduate	0	0
	Higher Secondary school	1	3.3
	High school	**11**	**36.7**
	Middle school	10	33.3
	Primary school	8	26.7
5.	**Area of residence**		
	Urban	11	36.7
	Rural	**19**	**63.3**

Table 1.1 presents the demographic characteristics of the participants. Most individuals were aged 41 years and above, with only a small proportion below 40 years. The sample consisted predominantly of males. In terms of marital status, the majority were married, while smaller proportions were widowed, single, or divorced. Educational attainment varied, with most participants having completed only primary, middle, or high school, and none holding graduate or postgraduate degrees. Additionally, a larger share of participants resided in rural areas compared to urban areas.

Part B: Description of clinical information of the patient:-

The clinical variables of the head and neck cancer patients receiving external radiation therapy are described in terms of Site of cancer, Stage of cancer, Number of times radiation therapy taken, Presence of any side-effects, Type of treatment, whether they have received previous information regarding self-management of common side-effects of external radiation therapy and Source of previous information.

Table 1.2 Frequency and percentage distribution of patient with head and neck cancer according to their clinical variables n=30

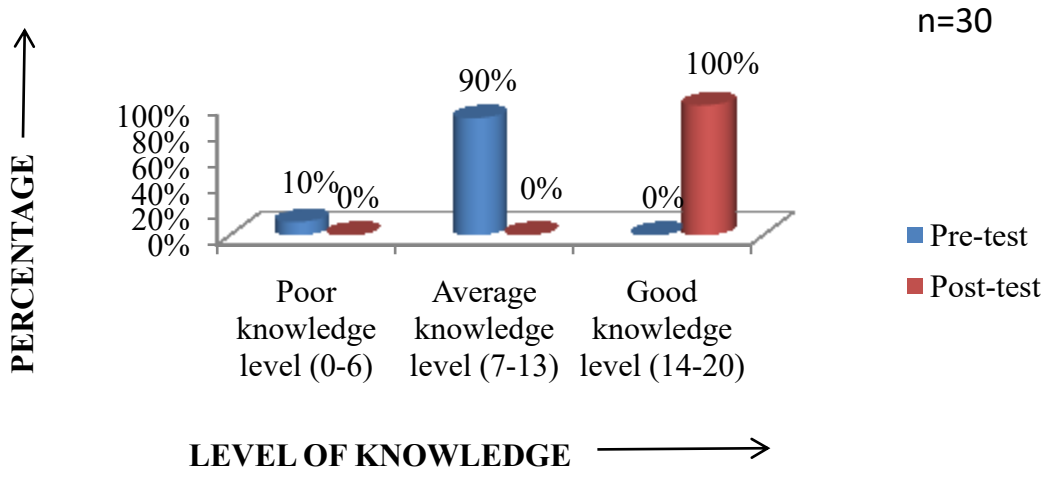
Sl.No	Characteristics	Frequency (f)	Percentage (%)
1.	**Site of cancer:**		
	Oral cavity	3	10
	Salivary glands	1	3.3
	Sinuses	1	3.3
	Nasal cavity	1	3.3
	Nasopharynx	3	10
	Throat	**16**	**53.4**
	Larynx	5	16.7
	Others	0	0
2.	**Stage of cancer**		

	Stage 1	8	26.7
	Stage 2	3	10
	Stage 3	**12**	**40**
	Stage 4	2	6.7
	Do not know	5	16.6
3.	**Number of times radiation therapy taken**		
	1 – 10 times	8	26.7
	11- 20 times	**12**	**40**
	21-30 times	7	23.3
	31 and above	3	10
4.	**Presence of any side-effects**		
	Yes	**30**	**100**
	No	0	0
6.	**Type of treatment**		
	Only External radiation therapy	6	20
	External radiation therapy and chemotherapy	**20**	**66.7**
	External radiation therapy and Surgery	1	3.3
	External radiation therapy, chemotherapy and surgery	3	10
7.	**Have you received information regarding self-management of common side-effects of External radiation therapy before?**		
	Yes	6	20
	No	**24**	**80**

Section II: Description of pre-test knowledge score and post-test knowledge scores on self-management of common side-effects of external radiation therapy on head and neck cancer patients:-

The percentage distribution of pre-test and post-test knowledge scores regarding self-management of common side-effects of External Radiation Therapy on head and neck cancer patients is shown by cylindrical diagram in Figure 2.1 below.

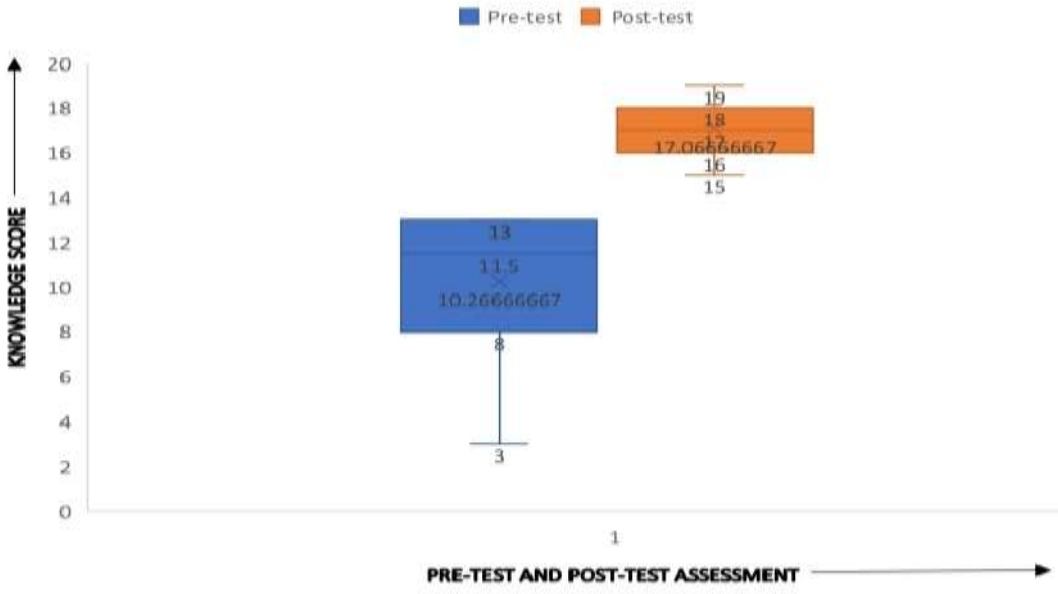
Figure 2.1 Cylindrical diagram for percentage distribution of pre-test and post-test knowledge scores



The above cylindrical bar diagram illustrates the distribution of participants' knowledge levels in the pre-test and post-test assessments. Knowledge levels were categorized as poor (score 0–6), average (score 7–13), and good (score 14–20). In the pre-test, 10% of participants demonstrated poor knowledge, 90% had an average level of knowledge, and none were in the good knowledge category. After the video-based educational intervention, the post-test results showed a marked improvement: 100% of participants achieved a good level of knowledge, with no

participants falling into the poor or average categories. The figure visually highlights the substantial increase in knowledge following the intervention.

Figure 2.2
Boxplot showing the pre-test and post-test knowledge score on self-management of common side-effects of external radiation therapy on head and neck cancer patients



The box plot (Figure 2.2) compares the distribution of knowledge scores between the pre-test and post-test assessments. In the pre-test (blue box), the median knowledge score was approximately 11.5, with scores ranging from a minimum of 3 to a maximum of 13. The interquartile range (IQR) spans from 8 to 13, indicating that most participants scored in the poor to average knowledge range prior to the intervention. The mean score (marked by "×") was approximately 10.27, reflecting relatively limited baseline knowledge.In contrast, the post-test (orange box) demonstrates a substantial improvement in knowledge scores. The median score increased to 17, with scores ranging from 15 to 19. The IQR (16 to 18) shows that the majority of participants achieved high scores following the educational intervention. The mean score also increased to about 17.07, indicating consistently higher performance across participants.Overall, the box plot clearly depicts a marked upward shift in both central tendency and score distribution, confirming the effectiveness of the video-based educational intervention in significantly enhancing participants' knowledge levels.

Section III: Effectiveness of video-based educational intervention on self-management of common side-effects of external radiation therapy on head and neck cancer patients:-
In order to find the effectiveness of video-based educational intervention on self- management of common side-effects of external radiation therapy on head and neck cancer patients, paired 't' test was calculated and the findings are tabulated in Table 3.

Table 3 Paired 't'-test for the comparison of knowledge before and after the implementation of video-based educational intervention regarding the self-management of common side-effects of external radiation therapy on head and neck cancer

n=30

Knowledge Score	Mean	Mean Difference	Standard error mean	't' value	P-value
Pre-test	10.26	6.8	0.598	11.37	0.0000
Post-test	17.06				

***'t'$_{(29)}$= 2.05, p<0.05**

The data presented in Table 3showed the comparison of knowledge regarding self-management of common side-effects of external radiation therapy on head and neck cancer before and after implementation of video-based educational intervention. The mean difference between the pre-test and post-test knowledge score was 6.8, the computed 't' value (11.37, p<0.0000) was found higher than the tabulated 't' value [t = 2.05, df = 29] which was statistically significant at 0.05 level of significance. The standard error of the mean difference is 0.598, suggesting relatively low variability in the sample mean. The p-value of 0.0000 (p < 0.05) demonstrates strong statistical significance, providing compelling evidence that the observed improvement in scores is not attributable to chance. Hence the null hypothesis was rejected and research hypothesis was accepted. So, the above analysis and interpretation of data presented in the tables indicated that video-based educational intervention on self-management of common side-effects of external radiation therapy on head and neck cancer patients receiving External Radiation Therapy significantly increased the knowledge in post-test.Therefore, video-based educational intervention on self-management of common side-effects of external radiation therapy on head and neck cancer patients was effective in terms of gain in post-test knowledge score.

Discussion:-

The findings of the present study demonstrate a substantial improvement in participants' knowledge regarding the self-management of common side effects of external radiation therapy following the video-based educational intervention. Prior to the intervention, 90% of the participants demonstrated only an average level of knowledge, while 10% had poor knowledge. None achieved a good knowledge level in the pre-test. This reflects a considerable baseline knowledge deficit among patients undergoing external radiation therapy. After the intervention, however, all participants achieved a good knowledge level, with scores ranging between 14 and 20. The marked increase in both the mean (17.06) and median (17) post-test scores compared with the pre-test mean (10.26) and median (11.5) clearly indicates the effectiveness of the video-based educational strategy. Additionally, the reduction in score variability—from a standard deviation of 2.99 in the pre-test to 1.20 in the post-test—suggests that the intervention not only improved knowledge but did so consistently across all individuals, regardless of their initial understanding.The results of this study align with several previous investigations that highlight the effectiveness of video-based educational tools in improving patient knowledge and promoting better understanding of cancer treatment and related procedures. González-Arriagada et al. (2013) demonstrated that educational videos significantly enhanced head and neck cancer patients' understanding of radiotherapy side effects, supporting the findings of the present study. Similarly, Nathoo (2017) reported that video-based educational materials effectively addressed informational needs among patients undergoing radiation therapy, improving comprehension and preparedness for treatment.

Beyond radiation therapy, evidence from broader oncology and public health contexts also reinforces the positive impact of video-based education. Drokow et al. (2021) showed that video interventions substantially improved knowledge related to cervical cancer, Pap smear screening, and HPV vaccination, emphasizing the value of visual learning modalities in promoting health literacy. Studies focusing on chemotherapy education have likewise underscored that video-based strategies enhance patient understanding and engagement in their treatment journey, highlighting video education as a powerful teaching–learning approach in oncology care. Additionally, programs integrating educational videos to improve cancer knowledge and patient empowerment have demonstrated significant benefits, further validating the findings of the present study.Collectively, these studies support the conclusion that video-based educational interventions are highly effective in enhancing patient knowledge in oncology settings. Such interventions leverage visual and auditory learning pathways, simplify complex clinical information, and allow repeated viewing—factors that are particularly important for patients experiencing treatment-related stress or cognitive overload. The present study adds to this body of evidence by demonstrating not only a significant improvement in knowledge but also a more uniform distribution of post-test scores, indicating consistent benefits across participants.Overall, the findings reaffirm the value of integrating structured video-based educational modules into patient education programs for individuals undergoing external radiation therapy. Enhancing patient knowledge is crucial for improving self-management practices, reducing anxiety, promoting adherence, and ultimately contributing to better treatment outcomes.

Conclusion:-

The findings of the present study demonstrate that the video-based educational intervention was highly effective in enhancing the knowledge of patients undergoing external radiation therapy for head and neck cancer. A significant improvement was observed from pre-test to post-test, with all participants achieving a good level of knowledge after the intervention. The increase in mean and median scores, along with reduced variability in post-test scores, indicates not only improved understanding but also consistent learning across all participants. These results highlight the value of structured, multimedia-based education in strengthening patients' ability to self-manage common side effects of radiation therapy. Integrating such video-based modules into routine clinical practice can serve as a simple, accessible, and impactful strategy to support patient empowerment and improve the overall quality of cancer care

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