

# Development of Comprehensive Yoga Program for Cervical Carcinoma

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## Abstract

**Background:** Prior research reveal the benefits of yoga in managing fatigue, stress and psychosocial outcomes in cervical carcinoma; however, a definite structured yoga program is unavailable. In this study an effort is made to develop and validate a structured yoga program for cervical carcinoma.

**Methods:** A detailed review of ancient and contemporary yoga literature was conducted to design a basic yoga program. Five yoga experts, who fulfilled the inclusion criteria validated the program. 27 practices were rated as (i) not essential, (ii) useful but not essential, and (iii) essential; Lawshe's content validity ratio (CVR) was calculated.

**Results:** Eighteen practices exhibited significant content validity (cut-off value: 0.99, as calculated by applying Lawshe's formula for the CVR). One practice was added to the module by the experts, making a total of 19 practices including meditation. Yoga nidra was added as a special practice on days of high fatigue.

**Conclusions:** The designed program received good content validity and thus is valid for cervical cancer. The program is to be applied on patients to assess its acceptability and feasibility.

**Keywords** Yoga; Cancer; Integrative care; Development; Palliative care; Supportive care

## Introduction

After breast cancer the incidence of cervical cancer is the highest in women worldwide, resulting in lack of vitality and diminished quality of life [1]. Human Papilloma Virus (HPV) infection causes more than 90% of the cases [2]. Over 500,000 new diagnosis and mortality of over 250,000 deaths was recorded (2012) [3]. Developing countries account for 80% of the world burden, due to ineffective control programs and screening [4]. Early-stages can be effectively cured. Chemoradiotherapy is the standard of care; Concurrent Cisplatin-based chemotherapy is advocated with Immunotherapy and hormonal replacement therapy [5-8].

Cervical cancer treatment presents with side effects which cause interruption in treatment outcomes, financial and psychosocial difficulties. Recurrent treatment remains largely ineffective hampering daily life [5].

Alternative methods have been adopted, of which Yoga is one. Significant difference was observed with yoga in quality of life, stress, emotional status, fluctuation in mood, depression, anger and confusion [9]. Literature on the effect of yoga on breast carcinoma is available, but no literature on the development of yoga module as an adjuvant therapy along with chemo-radiotherapy for cervical cancer patients [10].

## Methods

### Structuring integrated yoga module for cervical cancer

Integrated Yoga Module is structured by reviewing ancient yogic classical texts, recent research publication and other recent Yoga publications.

### Yoga experts

Experts were chosen among Oncologists, doctorate (PhD) in Yoga and therapists holding minimum experience of 3 years.

### Inclusion Criteria

- Classical texts of Yoga therapy, research publication, recent books and journals and research thesis which has the descriptions of Yoga for cancer
- To check the content validity, Yoga clinicians (MD - Yoga) / Yoga doctorates (PhD - Yoga) with minimum experience of 5 years in the field and Yoga instructor with at least 3 years' experience after post formal education, in association with oncologists.
- Consented to the study.

### Exclusion criteria

- Yoga therapists with less than 3 years' experience.
- Yoga instructors dealing with healthy individuals only.

### Design

Classical Yoga text books contemplate few postures and techniques which can be advocated for Cancer. To develop the protocol, following steps were followed:

**Step1: Review of classical text and research literature:** Classical texts, recent books on Yoga for Cervical cancer and other cancers, relevant dissertation/ thesis and research publications were referred for the development of the Yoga programme.

**Step2: Development of Yoga module:** Research studies on yoga published in scientific journals were extracted. Relevant practices were included in the Yoga module.

**Step3: Validation of Yoga module:** Validation was done with the help of 5 experts on a three point scale (0 to 2), 2 for essential, 1 for useful but not essential and 0 for not necessary.

**Step 4: Data analysis:** Results were tabulated and analysed using Lawshe's Content Validity Ratio (CVR) to check the content validity [11].

**Step 5: Report writing:** The final outcome report of the study conducted, inclusive of the results and discussion is formatted.

## Data analysis

The content validity was calculated using Lawshe Method (1975), If E denotes the number of experts marking a domain as essential and N the total number of experts, then Lawshe's CVR is defined as the ratio of  $(N_e - N/2)$  and  $N/2$  which arrive at the critical values as per Lawshe (1975). Where,  $N_e$ =total no. of Essentials for each practice and  $N$ =total no of panellists. The mean CVR represents the overall content validity.

## Results

The CVR ratio for all practices of the module is 0.762 for 5 experts.

Table 1 Shows CVR of Yoga practices of Integrated Yoga module as per Lawshe formula. As per the Lawshe's CVR ratio the minimum value for 5 experts is 0.99, the CVR ratio achieved is slightly lower, however a larger expert panel will better the acceptance of the module.

In this study, Nine practices viz; Griva Shithilikarana (0.2), Bhuja Shithilikarana (0.2), Gulpha Shithilikarana (0.6), Moon pose (0.6), Padahasthasana (0.6) Pashchimottanasana (0.2), Bhujangasana (0.2), Ardha Shalabhasana (0.6) and Kapalabhatti (-1) were insignificant. All other practices were considered to satisfy the minimum value to be achieved.

Based on the comments of the yoga experts, the butterfly practice with fast/slow flapping for 2 minutes was included into the program to aid circulation, stretch and relax abdomen. Yoga Nidra was suggested to be performed on days of chemotherapy when the fatigue scores are high. The finalised yoga program consisted of 20 practices (Table 2).

Total duration: 60 minutes

All the above practices have been used in various RCT studies and the experts opine that these practices can be performed by cancer patients. However, the severity of any pain, GI disturbances and fatigue should be taken into consideration at every session. There are more chances of acceptability of this Yoga module, hinting towards a more positive effect with minimum negative effect if any.

Sl No	Specific Practice	Ne	N	N/2	Ne-N/2	CVR
1	Griva Shithilikarana	3	5	2.5	0.5	0.2
2	Bhuja Shithilikarana	3	5	2.5	0.5	0.2
3	Kati Shithilikarana	5	5	2.5	2.5	1

4	Janu Shithilikarana	5	5	2.5	2.5	1
5	Gulpha Shithilikarana	4	5	2.5	1.5	0.6
6	Hands in and out breathing	5	5	2.5	2.5	1
7	Hand stretch Breathing	5	5	2.5	1.5	1
8	Tiger Breathing	5	5	2.5	2.5	1
9	Moon Pose breathing	4	5	2.5	1.5	0.6
10	Quick Relaxation Technique	5	5	2.5	2.5	1
11	Ardhakati chakrasana	5	5	2.5	1.5	1
12	Ardha Chakrasana	5	5	2.5	1.5	1
13	Padahasthasana	4	5	2.5	0.5	0.6
14	Pashchimottanasana	3	5	2.5	0.5	0.2
15	Ardha Matsyendrasana	5	5	2.5	2.5	1
16	Setubandhasana	5	5	2.5	2.5	1
17	Suptaudarakarshanasana	5	5	2.5	1.5	1
18	Ardha Pavanamuktasana	5	5	2.5	2.5	1
19	Bhujangasana	3	5	2.5	0.5	0.2
20	Ardha Shalabhasana	4	5	2.5	1.5	0.6
21	Deep relaxation Technique	5	5	2.5	2.5	1
22	Kapalabhati	1	5	2.5	-1.5	-0.6
23	Vibhagya Pranayama	5	5	2.5	2.5	1
24	Nadishuddi	5	5	2.5	2.5	1
25	Bhramari Pranayama	5	5	2.5	1.5	1
26	Nadanusandhana	5	5	2.5	2.5	1
27	Om Dhyana	5	5	2.5	1.5	1
	Average	4.41	5	2.5	1.648	0.763

**Table 1:** Shows CVR of Yoga practices of Integrated Yoga module as per Lawshe formula1.

S No.	Practice (Sanskrit)	Practice (English)	Rounds	Time (minutes)
1	Kati Shithilikarana	Waist rotation	3	1
2	Janu Shithilikarana	Knee tightening	3	1
3	Shvasa kriya	Hands in & out	3	3
4	Shvasa kriya	Hand stretch Breathing	3	3
5	Vyaghra shvasana Kriya	Tiger breathing	3	3
6	Moon pose	Quick Relaxation Technique	1	4
7	Ardha Chakrasana	Lateral arc pose		

		Right half	1	1
		Left half	1	1
8	Ardha Chakrasana	Half wheel posture	1	1
9	Ardha Matsyendrasana	Half spinal twist		
		Right half	1	1
		Left half	1	1
10	Butterfly Asana	Fast movements	1	2
		Slow	1	2
11	Setubandhasana	Bridge pose	3	3
12	Supta Udarakarshanasana	Folded leg stretch		
		Right leg	3	6
		Left leg	3	
13	Ardha Pavanamuktasana	Half wind releasing pose		
		Right side	1	1
		Left side	1	1
14		Deep Relaxation technique	1	5
15	Vibhagya Pranayama	Sectional Breathing		
		Abdominal	3	
		Thoracic	3	4
		Shoulder	3	
16	Nadi Shuddi	Alternate nostril Breathing	9	4
17	Bhramari Pranayama	Low pitch chant	5	2
18	Chanting	AA chant	9	
		UU chant	9	
		MM chant	9	5
		AUM chant	9	
19	Om Dhyana	Om Meditation		5
20	Yoga Nidra	On days with Chemo	1	5

**Table 2:** Evaluated/recommended integrated Yoga module for Cervical Cancer as per the CVR ratio.

## Discussion

Cervical cancer affects women in the productive age of 40-60 years [12]. Risk factors are compromised immunity, Contraceptive pills, early marriage and multiple sex partners [13].

Cancer can affect the society as a financial burden, personal burden by loss of function, depression, pain followed with role changes and dependence.

Results indicate personal burden (high level of pain, fatigue, and depression associated with cancer) and low quality of life have higher adverse effect [14].

Globally yoga therapy has received widespread acceptance as a complementary and alternative practice for a range of diseases. Growing evidences compel CAM practitioners to adopt Yoga therapy. Several schools of Yoga (Asana based, Pranayama based, Meditation based) are set up, having their own approach in treating cancer.

### Rationale for using yoga intervention in cervical cancer

The mind and body act in coordination through yoga enhancing mood and relieve pain.

Reports highlighting the beneficial effect of meditation and yoga amongst breast cancer patients are available. It can similarly be applied to cervical cancer. As yoga affects both the physical and mental entities of the body, improvement in the quality of life is achieved.

It integrates awareness of breath rendering deep relaxation. Yoga can effectively manage symptoms like distress, compromised sleep and fatigue [15]. Meditation improves the psychosocial aspects of cancer [16]. Regular practice boosts the self-esteem [17].

There is no prior mention of a standardized integrated Yoga module, exclusive for cervical cancer patients. In this study, an effort was made to develop a yoga module by using available evidences and textual references, to be implemented for 4 weeks with personalised 60 minute duration sessions.

Around 25 research studies from different schools of Yoga on Oncology and 15 Yoga and Ayurveda related classical and recent books on Cancer were referred to formulate the module.

The Yoga practices were finalised based on the content validity criteria. After thorough literature review, the module was drafted and validated by Yoga experts.

The module was developed for 60 minutes by the yoga experts and each practice was reviewed in detail with oncologists, oncology nursing staff and supporting oncology staff to finalise the practices feasible for the patients (Table 3).

Data analysis revealed a CVR ratio of 0.762 for all 27 yoga practices of formulated yoga module for Cervical cancer. The final results of the protocol to be achieved by Lawshe' CVR ratio is 0.99 for 5 experts involved in the study. The limitation being, even if one of the practices receives a score less than maximum (2, essential practice), the overall CVR will drop to >0.99. Thus, validation by larger number of experts can result in better acceptance. Practices for which CVR was less than 0.99 were excluded from the module.

Practices	Experimental/Journal Reference	Classical reference/Book reference
Specific Practices		
<b>1. Loosening Exercises</b>		
a. Neck Movements b. Shoulder movements c. Waist twisting d. Knee tightening e. Ankle rotation	Monro, R et al (1990) Yoga for Common Ailments', Eds. Nanay Ford Kohna A, Gaia origina, Pub: Simon & Schuster Inc, New York, London, 14.	(Nagaratna et al., 1990)
<b>2. Breathing Techniques</b>		
a. Hands in & out b. Hand Stretch c. Rhythmic tiger breathing d. Shashankasana Breathing	Siedentopf, F et al. (2013) Yoga for patients with early breast cancer and its impact on quality of life—a randomized controlled trial.	(Nagaratna et al, 2012)
<b>3. Asana- Standing (wall support)</b>		
a. Ardh Kati Chakrasana b. Ardha Chakrasana c. Pada Hastasana	Bijlani, R. L et al (2005) A brief but comprehensive lifestyle education program based on yoga reduces risk factors for cardiovascular disease and diabetes mellitus. Journal of Alternative & Complementary Medicine, 11(2), 267-274.	(Nagaratna et al., 1990)
<b>4. Asana -Sitting Postures</b>		
a. Paschimottanasana	Dandawate et al (2010). Magic of ayurveda ad yoga: A overview.	Asana Pranayama Mudra Bandha (Swami Satyananda, 2013)
b. Ardha Matsyendrasana	Lee, M., Moon, W., & Kim, J. (2014) Effect of yoga on pain, brain-derived neurotrophic factor, and serotonin in premenopausal women with chronic low back pain. Evidence-Based Complementary and Alternative Medicine, 2014.	Hatha Yoga Pradeepika (2013)
<b>5. Asana-Supine</b>		
a. Sethu bandhasana b. Folded leg lumbar stretch c. Ardha Pawanmuktasana	Mustian et al (2013). Multicenter, randomized controlled trial of yoga for sleep quality among cancer survivors. Journal of Clinical Oncology, 31(26), 3233-3241.	Asana Pranayama Mudra (2012)
<b>6. Asana-Prone</b>		
a. Bhujangasana	Littman, A. J. et al (2012) Randomized controlled pilot trial of yoga in overweight and obese breast cancer survivors: effects on quality of life and anthropometric measures. Supportive Care in Cancer, 20(2), 267-277.	Light on Yoga (Iyengar, 2011)
b. Ardha shalabhasana		Nagaratna et al., (1990)
<b>7. Pranayama</b>		
a. Kapalabhati b. Vibhagya Pranayama (Sectional Breathing) - Abdominal - Thoracic - Clavicular c. Nadi Shuddi d. Bhramari e. Ujjayi Pranayama	Chakrabarty, J. et al (2015). Effectiveness of pranayama on cancer-related fatigue in breast cancer patients undergoing radiation therapy: A randomized controlled trial. International journal of yoga, 8(1), 47. Rao et al (2008). Effects of yoga on natural killer cell counts in early breast cancer patients undergoing conventional treatment. Comment to: recreational music-making modulates natural killer cell activity, cytokines, and mood states in corporate employees. Medical Science Monitor, 14(2), LE3-LE4.	Hatha Yoga Pradeepika, (2013)
<b>8. Relaxation</b>		
a. Quick relaxation b. Deep relaxation		
<b>9. Meditation</b>	Kang, G., & Oh, S. (2012) Effects of mindfulness meditation program on perceived stress, ways of coping, and stress response in breast cancer patients. Journal of Korean Academy of Nursing, 42(2), 161-170.	

a. Nadasanandhana b. Om meditation	Vadiraja, S. H. et al (2009) Effects of yoga on symptom management in breast cancer patients: a randomized controlled trial. International journal of yoga, 2(2), 73.	Nagaratna et al., (1990)
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**Table 3:** Literature reviews of Yoga practices used for Cervical Cancer module.

Nine practices viz; Griva Shithilikarana (0.2), Bhuj Shithilikarana (0.2), Gulpha Shithilikarana (0.6), Moon pose (0.6), Padahasthasana (0.6) Pashchimottanasana (0.2), Bhujangasana (0.2), Ardha Shalabhasana (0.6) and Kapalabhatti (-1) were not found to be significant to Cervical cancer. Griva shithilikarana and Bhuj Shithilikarana were considered insignificant as they do not target cervical cancer complaints.

Padahasthasana, Pashchimotanasana, Bhujangasana and Ardha Shalabhasana were removed due to difficulty in performing and raise in abdominal pressure, pain and discomfort. Thus, these practices do not qualify to be included in the program.

Four out of 5 experts opined that the butterfly practice should be included into the program as it helps in increasing tone and relax the pelvic region.

Viparita karani was suggested by only two experts so it was not added into the module. All the experts suggested the inclusion of yoga nidra at the end of the session on days the patient presents with high fatigue scores/ day of chemotherapy.

A total of 19 practices were finalised with an addition of butterfly practice making it a total of 20 practices. The module was sent to the experts again for a finalising. No further changes were suggested by the experts.

## Conclusion

Integrated Yoga module consists of 20 practices for Cervical cancer which were constructed based on literature review. The Integrated Yoga module validated by a panel of 5 yoga experts and oncologists, revealed that, among 27 yoga practices, 18 were found to be essential ( $CVR \geq 0.99$ ) and 9 were found to be not essential ( $CVR \leq 0.99$ ). One practice was added to the module by the experts, making a total of 19 practices including meditation. Yoga Nidra was added as a special practice on days of high fatigue.

The present validation brings greater acceptability of Yoga therapy module for Cervical cancer. Addition of one practice was made based on the suggestions from the expert authors. A panel of greater number of experts would fetch higher CVR scores for the current module. There is scope for more research to evaluate effect of Yoga practice and its mechanism.

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