

## A yoga module for musicians: compilation and validation

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### Abstract

**Objectives.** The objective of the study was to develop and validate a yoga module for musicians. **Methods.** Two researchers (with any of twenty years of experience in researching yoga and testing yoga modules) developed the module from (i) published research on yoga for musicians, (ii) observations of yoga teachers and (iii) from studies on the physiological effects of yoga carried out on non-musician healthy volunteers. Thirty-two experts in music and yoga (with average experience in yoga  $7.3 \pm 7.2$  years, average experience in music  $8.6 \pm 12.3$  years; ages 18 to 60 years m:f ratio = 15:17) rated each component of the yoga module for usefulness to musicians on a five-point Likert scale. The level of agreement for each practice among thirty-two experts was determined using Lawshe's Content Validity Ratio (CVR). A CVR value  $\geq 0.375$  was considered the critical value (minimum qualifying value) for inclusion of an item in the module based on Lawshe's CVR norms. **Results.** Four practices with a CVR score below 0.375 were excluded from the module. The revised yoga module is presented here with four categories of yoga techniques including (A) loosening exercises (six practices), (B) yoga postures (two practices), (C) breathing techniques (three practices) and (D) guided relaxation. **Conclusion.** The yoga module can be useful for musicians to (i) promote positive physical health (e.g., improve postural stability and promote flexibility), (ii) lower the risk of repetitive stress injuries or musculoskeletal discomfort and (iii) reduce performance anxiety as well as mental stress.

**KEYWORDS:** Yoga; Musicians; Sound production; Performance anxiety.

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### 1. Introduction

Preventive programs are relevant to maintain the health and wellbeing of musicians who often sustain musculoskeletal repetitive stress injuries [1]. These programs should address health challenges for all musicians as well as those which are specific to particular categories of musicians depending on the instruments they use. Mind and body interventions including yoga are used in occupational health to enhance emotional well-being and resilience to stress in the workplace [2,3]. Yoga practice also addresses physical health challenges, for instance yoga practice was reported to be an effective adjunctive treatment for (i) low back pain [4], (ii) chronic neck pain (with yoga practice lowering intensity of pain and pain related disability

compared to control groups) [5] and (iii) upper limb stress injuries, where the proper practice of yoga reduced symptoms and increased function [6].

Based on these benefits, yoga can be useful for musicians [7]. With this background a yoga module with four components of yoga practice was developed for all categories of musicians in mind, especially focusing on (i) musculoskeletal functions and (ii) on anxiety. The module was validated by experts in music and yoga who rated the usefulness of each component of the module. The level of agreement for each practice among experts was determined using Lawshe's Content Validity Ratio (CVR) [8].

## **2. MATERIALS AND METHODS**

The aim of the study was to develop a yoga module especially focusing on (i) musculoskeletal functions and (ii) on anxiety in musicians. The scope of the study includes (i) development of a yoga module and (ii) validation of the yoga module from experts in yoga and music.

The study had two stages: (i) development of the yoga module intended to promote physical and mental well-being of musicians, (ii) validation of the module by selected experts in music and yoga. The informed consent was obtained from each expert. The study was approved from the ethics committee of the institution (PRF/YRD/023/007/1).

### **2.1 Development of the module**

In the first stage, two researchers (ST, SS with any of twenty years of experience in researching yoga and testing yoga modules) developed the module from (i) published research on yoga for musicians [9-12], (ii) observations of yoga teachers [13] and (iii) from studies on the physiological effects of yoga carried out on non-musician healthy volunteers [14]. Yoga practices which (i) improve the overall posture, (ii) increase the strength and flexibility of core muscles, (iii) increase the ability to hold an asymmetric posture for a long period of time, (iv) reduce musculoskeletal pain, and (v) reduce mental stress and anxiety were selected. The module included the following categories of yoga practice techniques: (i) loosening exercises (*sithilikaranavyayam*), (ii) yoga poses (*asanas*), (iii) breathing practices (*pranayamas*) and (iv) guided relaxation.

### **2.2 Validation of the module.**

The questionnaire to rate the module was prepared as a Google Form, with the module presented along with columns for validation using a five-point Likert scale (i.e., (1) not at all useful, (2) a little useful, (3) moderately useful, (4) very useful, and (5) extremely useful). The questionnaire along with a note about the purpose of the study was sent to thirty-three persons accomplished in both music and yoga (with a range of experience in music between 2 and 45 years and experience in yoga between 2 and 30 years). To be considered accomplished and eligible to validate the module, an individual had to have over two years' experience in both music and yoga. Recruitment of eligible persons as respondents to the validation questionnaire was carried out in three ways (i) a Google search of persons published in 'yoga and music' yielded four names with contact details, (ii) persons contacted suggested three other likely and suitable experienced respondents and (iii) respondents were recruited from a university offering a course in 'yoga and music' (n = 26). Of the 33 persons contacted, 32 responded to the request and completed the questionnaire for validation of the module. The thirty-two persons selected are referred to as 'experts' from this point onwards. The baseline characteristics of the thirty-two experts are provided in Table 1.

The level of agreement for the usefulness of each yoga practice listed in the module among the thirty-two experts was determined using Lawshe's Content Validity Ratio (CVR) [8]. The CVR ratio for each yoga practice was calculated using the following formula:  $CVR = (Ne - N/2)/N/2$ ; where,  $Ne$  = total number of experts indicating a practice 'useful and extremely useful' (4 or 5 on the five point Likert scale used in the study) and  $N$  = the total number of experts (32 in this case) [8]. The critical value or minimum qualifying value of CVR to test for an over 50 percent agreement among thirty-two experts (of a yoga practice as useful) is 0.375 [15]. Hence a CVR value  $\geq 0.375$  was considered as the critical value (minimum qualifying value) for inclusion of a yoga practice in the final module.

#### Appendix 1. A yoga module intended for musicians.

Sl. no	Name of Practice	Duration	Possible Benefits	Not at all useful (1)	A little useful (2)	Moderately useful (3)	Very much useful (4)	Extremely useful (5)
A	Loosening exercises ( <i>Sithilikaranavyayam</i> ) I. Neck extension and flexion	15 minute  1.5 minute	1.Reduce neck pain 2. Overall posture					
	II. Sideways neck stretch	1.5 minute	1. Reduce neck pain 2. Overall posture					
	III. Lateral neck stretch	1.5 minute	1. Reduce neck pain 2. Overall posture					
	IV. Shoulder rotation	1.5 minute	1. Range of motion at the shoulders 2. Overall posture					
	V. Finger, Wrist and Elbow movements	3 minute	1. Upper limb repetitive stress injuries (prevention					

			and managem ent)					
	VI. Upper and lower back stretches	6 minute (3 minute for upper back and 3 minute for lower back)	1. Overall posture 2. Strengthen the back muscles and relieve back pain					
B	Yoga postures ( <i>asanas</i> )	15 minute						
	I .Triangle posture ( <i>Trikonasana</i> )	2 minute	1. Ability to hold an asymmetric posture for prolonged periods and (ii) correct postural asymmetry					
	II .Cow face posture ( <i>Gomukhasan</i> )	2 minute	1. Increase the strength and flexibility of the upper extremities (i.e., upper arms, shoulder), upper back and neck					
	III. Downward facing dog ( <i>Ardha Padma Pavatasana</i> )	2 minute	1. Overall posture					

	IV .Cobra posture ( <i>Bhujangasana</i> )	2 minute	1. Reduce neck pain, 2. Increase strength and flexibility of abdomen, back and core muscles					
	V. Locust posture ( <i>Shalabhasana</i> )	2 minute	1. Strengthens the back and core muscles					
	VI .Corpse posture ( <i>Shavasana</i> )	5 minute	1. Reduces anxiety and aggression					
C	Yoga breathing regulation ( <i>Pranayama</i> )	10 minute	1. Improve sound production by enhancing the lung capacity					
	I .Yoga sectional breathing ( <i>Vibharga pranayama</i> )	2 minute						
	II .Alternate nostril breathing ( <i>AnulomVilom pranayama</i> )	4 minute		1. Reduces blood pressure and anxiety				
	III . Bumble bee breath ( <i>Bhramari pranayama</i> )	4 minute	1. Reduces anxiety					
D	Guided relaxation	5 minute	1. Reduces anxiety					

### 3. Results

The module that was sent to the thirty-two experts for their rating is provided as an Appendix (see Appendix 1). The thirty-two experts provided their rating for all the practices. Four practices scored CVR less than the 0.375; hence these practices were removed from the final yoga module. The remaining twelve practices scored  $CVR \geq 0.375$  and were included in the final module along with the CVR values (Table 2).

**Table 1. Characteristics of thirty-two experts**

<b>Characteristics</b>	
<b>Experience in yoga</b>	
Group mean $\pm$ SD	7.25 $\pm$ 7.188
Range of experience	2 to 30 years
<b>Experience in music</b>	
Group mean $\pm$ SD	8.625 $\pm$ 12.3
Range of experience	2 to 45 years
<b>Types of musician</b>	
(i) string musicians	7
(ii) woodwind musician	5
(iii) vocalists	16
(iv) percussionist	4

**Table 2. A yoga module intended for musicians.**

<b>Sl. no</b>	<b>Name of Practice</b>	<b>Duration</b>	<b>Possible Benefits<sup>#</sup></b>	<b>Ne</b>	<b>CVR</b>
A	Loosening exercises ( <i>Sithilikaranavyayam</i> )	15 minute			
	I. Neck extension and flexion	1.5 minute	1.Reduce neck pain	26	0.625

			2. Overall posture		
	II. Sideways neck stretch	1.5 minute	1. Reduce neck pain 2. Overall posture	24	0.500
	III. Lateral neck stretch	1.5 minute	1. Reduce neck pain 2. Overall posture	27	0.687
	IV. Shoulder rotation	1.5 minute	1. Range of motion at the shoulders 2. Overall posture	23	0.437
	V. Finger, Wrist and Elbow movements	3 minute	1. Upper limb repetitive stress injuries (prevention and management)	22	0.375
	VI. Upper and lower back stretches	6 minute (3 minute for upper back and 3 minute for lower back)	1. Overall posture 2. Strengthen the back muscles and relieve back pain	22	0.375
B	Yoga postures ( <i>asanas</i> )	15 minute			
	I. Triangle posture ( <i>Trikonasana</i> )	2 minute	1. Ability to hold an asymmetric posture for prolonged periods and (ii) correct postural asymmetry	15	-0.062*
	II. Cow face posture ( <i>Gomukhasan</i> )	2 minute	1. Increase the strength and flexibility of the upper extremities (i.e., upper arms, shoulder), upper back and neck	21	0.313*

	III. Downward facing dog ( <i>Ardha Padma Pavatasana</i> )	2 minute	1. Overall posture	18	0.125*
	IV. Cobra posture ( <i>Bhujangasana</i> )	2 minute	1. Reduce neck pain, 2. Increase strength and flexibility of abdomen, back and core muscles	28	0.750
	V. Locust posture ( <i>Shalabhasana</i> )	2 minute	1. Strengthens the back and core muscles	21	0.313*
	VI. Corpse posture ( <i>Shavasana</i> )	5 minute	1. Reduces anxiety and aggression	24	0.500
C	Yoga breathing regulation ( <i>Pranayama</i> )	10 minute			
	I. Yoga sectional breathing ( <i>Vibharga pranayama</i> )	2 minute	1. Improve sound production by enhancing the lung capacity	26	0.625
	II. Alternate nostril breathing ( <i>Anulom Vilom pranayama</i> )	4 minute	1. Reduces blood pressure and anxiety	26	0.625
	III. Bumble bee breath ( <i>Bhramari pranayama</i> )	4 minute	1. Reduces anxiety	25	0.563
D	Guided relaxation	5 minute	1. Reduces anxiety	22	0.375

$n_e$  = number of experts indicating ‘useful and extremely useful’ (4 or 5 in 1–5 Likert scale),  
N = Total number of experts, CVR = Content validity ratio. \*Excluded in final module

\*These practices were removed from the final module

#These benefits have been extrapolated from clinical experience and research studies on these practices in non—musicians population.

#### 4. Discussion

A yoga module for musicians especially focusing on (i) musculoskeletal functions

and (ii) on anxiety was developed and validated by thirty-two experts who had experience in both music and in yoga. The



module consists of six loosening exercises (*sithilikaranavyayam*), two postures (*asanas*), three volitional yoga breathing practices (*pranayama*) and guided relaxation. The yoga practices intended to help all categories of musicians improve their overall posture [16], since postural regulation is known to improve with yoga [17]. Using music instruments often requires assuming unusual and asymmetrical postures for long durations [18]. For example, keeping the arms raised over a sustained period of time leads to neck and shoulder pain, with different degrees of discomfort in brass players (e.g., trumpet, trombone.), woodwind musicians (e.g., oboe, clarinet) and lower string players [19]. The yoga module presented here is intended to address varying levels of musculoskeletal discomfort in musicians across a range of musical instruments, while also reducing the risk of repetitive stress injuries. Musicians are at high risk of developing repetitive strain injuries related to their long durations of practice and performance [20]. Also, musicians are more likely to have musculoskeletal complaints as compared to the general working population, with most complaints involving the upper limb and the back [21]. Previously, regular practice of yoga (including loosening exercises and yoga postures) was shown being to improve repetitive finger movements, hand grip strength, while reducing upper extremity (i) promoting positive physical health (e.g., increased stamina, endurance, and flexibility), (ii) enhancing mental functions and health (e.g., improved focusing, creativity, auditory perceptual sensitivity, and mindful awareness), (iii) lowering the risk of physical injury (e.g., repetitive stress

discomfort and backpain in professional computer users, who like musicians, also need to sustain specific postures and repetitive movements over sustained periods of time [22].

Apart from physical demands, public performance can be demanding for musicians [23] Research has demonstrated higher state anxiety before and during a performance in the presence of audience as compared to performing without an audience [24]. Musicians also show greater physiological arousal when performing in public [25]. Previously, in a two-group trial, over a six week period yoga reduced performance-anxiety in adolescent musicians [12]. Many components of the present module have been shown to reduce anxiety, especially volitionally regulated breathing practices (*pranayama*) [26], specific yoga postures (*asanas*) [27] and guided relaxation [28].

Based on the calculated CVR, four practices were removed from the final module. These were four yoga poses (i.e., Triangle posture, Cow face posture, Downward facing, and Locust posture).

## 5. Conclusions

In summary, the yoga practices included in the module can be useful for musicians by

injuries or discomfort associated with assuming asymmetric postures for an extended period of time), and (iv) reducing performance anxiety and mental stress. The yoga module presented here remains to be tested on musicians, which is a direction for future research.

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