



# Medical yoga in the workplace setting—perceived stress and work ability—a feasibility study



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## ABSTRACT

**Objective:** This study examined the feasibility of using an intervention of Medical Yoga in the workplace and investigated its effects on perceived stress and work ability.

**Design and setting:** This was a quasi-experimental pilot study comparing a group who received Medical Yoga (intervention group, N = 17), with a group waiting to receive Medical Yoga (control group, N = 15). **Intervention:** Medical Yoga in nine weekly sessions led by a certified instructor, as well as an instruction film to be followed at home twice weekly.

**Main outcome measures:** Feasibility was assessed through recruitment, eligibility, willingness to participate, response to questionnaires and adherence to the intervention plan. Stress was measured with the Perceived Stress Scale, work ability with the Work Ability Index.

**Results:** Convincing unit managers to let their employees participate in this intervention was difficult. Eligibility was perfect, but only 40% of workers were willing to participate. The subjects adhered to a great extent to the intervention and answered the questionnaires satisfactorily. Reaching target individuals requires careful attention to informing participants.

The intervention showed no significant effects on stress and work ability, though the two measures correlated significantly over time.

**Conclusion:** Factors limiting feasibility of this workplace intervention were identified. Work place interventions may need to be sanctioned at a higher managerial level. The optimal time, length and availability of the workplace intervention should be explored further. Knowledge from this study could be used as a foundation when planning a larger scale study.

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## 1. Introduction

In Sweden, as in the rest of the world, health care is a growing sector in both the public and private arenas.<sup>1</sup> Health care employs a considerable number of people – half a million individuals in Sweden alone. This represents 13% of the workforce – the largest work contingent in the country – and the majority are women.<sup>2</sup> In addition, the nursing and care professions have the highest numbers of workers on sick leave.<sup>2</sup> of all professional categories.

There are reports from the health care sector of increased workload, complex work processes, inability to perform the required work tasks within the allotted time, and a growing concern about achieving standards of quality.<sup>3,4</sup> Ultimately, this boils down to

concerns for patient safety,<sup>5</sup> which leads to stress and ill-health amongst staff.<sup>3</sup> – more so in the public than the private domain<sup>6</sup> Work stress has been found to be associated with reduced work ability,<sup>7,8</sup> i.e. reduced capacity to perform the tasks a function demands, and worker's health and competence.<sup>9</sup> Therefore, the current situation in the health care sector is costly and could potentially be a threat to safe medical management.

Yoga is an ancient Tibetan form of health-promoting activity that encompasses both the physical and the mental aspects of relaxation. It is a series of bodily movements combined with specific breathing techniques and meditation, in which the focus of attention is inwards, using the body as a tool to reach a meditative state. Its goals are health and well-being. The method has been evaluated scientifically and has been shown to have positive effects on pain,<sup>10,11</sup> stress,<sup>12,13</sup> and quality of life<sup>12,14</sup> In a study among nurses, yoga was found to improve sleep and decrease work stress.<sup>15</sup> The measurable objective effects include lower blood pressure,<sup>14</sup> reduced levels of stress hormones.<sup>16</sup> and lower blood

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glucose levels<sup>17,18</sup> The type of yoga chosen seems indifferent for the positive effects.<sup>19</sup>

Medical Yoga (MY) is a Swedish form of yoga adapted from the classic Kundalini yoga that allows people with neck and back pain to benefit from the exercises. Like traditional yoga, the movements in MY are very slow, but they are always guided by an instructor who is a trained health care practitioner. Studies of MY have demonstrated positive effects on stress,<sup>12</sup> and chronic low back pain<sup>20</sup> and the method is used in the Nordic countries, Australia, the UK and the US<sup>21</sup>.

The aim of this study, which is part of a master's (MSc) study in occupational health, was to test the feasibility of a work-based intervention with MY among medical public nursing home and home care service staff. MY could, considering its stress-reducing effects be excellently suited for these types of health care workers. The intervention was offered to the staff of one unit; the other unit served as a control. The feasibility of this type of intervention was determined through assessing recruitment, eligibility, willingness to participate, response to questionnaires and adherence to the intervention plan. Further, subjects' stress levels and perceived work ability were assessed before and after the intervention and compared between the two groups.

## 2. Materials and method

### 2.1. Study design

This was a quasi-experimental study, as the assignment to intervention/control was not randomized.

### 2.2. Recruitment and sample

The unit managers of five work groups of medical staff in public nursing homes and home care services in the target county in southern Sweden were contacted to gauge their interest in the study; three managers responded positively as regards their staff participating. Subsidiarity was the deciding factor for selecting participant workgroups; they had to be located close to the lead investigator (GF), and the sample was therefore described as a convenience sample. The medical staff categories included registered nurses, auxiliary nurses and nurses' assistants; the only inclusion criterion was that the subjects belonged to any of these three professional categories. It was decided to exclude subjects who were pregnant, as the pregnancy may lead to stress in itself,<sup>22,23</sup> as well as a decreased ability to deal with stress or reduced work ability. Though these subjects were not prohibited from taking part in the MY intervention, their data would be omitted from the analysis. In the same vein, subjects who were currently undergoing other forms of stress-reducing therapy would not be prohibited from the MY training, but their data would be excluded in the analysis.

In the first step, the participating unit managers informed their staff about the study using a leaflet supplied by the investigators, and invited staff to a meeting with the lead investigator. At the meeting, information concerning MY, the purpose of the study and the logistics involved was provided, and questions from the potential participants were answered. Care was taken to keep the information regarding the potential effects of MY as neutral as possible, only stating the outcome measures in the study and how they would be measured. A screening question regarding stress<sup>24</sup> was answered by each of the staff members interested in participating.

### 2.3. Intervention and setting

The MY training was offered to the intervention group over a period of nine weeks in the autumn of 2014. In agreement with

the local unit manager, one morning and one afternoon session – each lasting 75 min – were scheduled every week in order to allow all staff to attend once a week. The sessions were timed so that participants could attend after finishing a shift or on a day off. In addition, the participants were instructed to practice MY at home at least twice a week using a downloadable 25-min instruction video.

Due to a lack of suitable facilities at the workplace, the MY training sessions were held at a nearby training facility. The lead investigator (GF), a certified MY instructor, was in charge of all the sessions. The sessions – whose content is based on the MY protocol developed by the Institute of Medical Yoga<sup>25</sup> – started with breathing exercises while lying down followed by seated exercises for the whole body, and finished with seated meditation. The frequency of the training was based on previous research<sup>26</sup>

The control group was offered MY after completion of the study period and was thus designated a waiting-list control group.

### 2.4. Measurements and outcomes

Some demographic variables were collected for all participants: age, sex, profession, degree of employment (i.e. part or full time), type of employment (i.e. permanent or temporary) and number of years at the current work place.

The Perceived Stress Scale (PSS) was chosen because it is a generic instrument that measures the perceived level of stress in one's life.<sup>27</sup> It examines both work-related and private stress through 14 questions that are summed up on a scale from 0 to 56; the higher the value, the higher the levels of stress. A previous longitudinal study suggests that mean values for PSS range from 12.0 to 17.5 among an adult population.<sup>28</sup>

The Work Ability Index (WAI) was used to measure perceived work ability.<sup>29</sup> It contains 7 items on work ability in relation to the best perceived ability and in relation to work demands. It also involves parameters for illness and sick-listing. Guideline values exist for excellent (44–49), good (37–43), moderate (28–36) and poor (7–27) work ability.<sup>30</sup>

PSS and WAI were measured before the first training session and one week after ending the MY training for the intervention group, and at the corresponding times (i.e. nine weeks apart) for the control group.

To check compliance with the home training program, an automated text message was sent to the participants in the intervention group every Sunday afternoon asking about the number of home training sessions during the past week. This task was managed using a program called SMS Track<sup>®</sup>.<sup>31</sup>

### 2.5. Data analysis

To assess the feasibility of the study, a number of parameters were examined. Recruitment rate was calculated through dividing the number of units participating by the number of units approached. Eligibility was the number of participants excluded by the initial stress question plus any of the exclusion criteria. Willingness to participate was calculated through dividing the number of subjects in the study by the number of subjects in the source population. Response rate to questionnaires was the number of those successfully completed divided by the total number administered. Finally, adherence to the intervention was the number of exercise sessions performed (in class and at home) divided by the "desired" number (9 supervised classes + 18 at-home exercises = 27). For those participants who trained more than 27 times, adherence was noted as 27.

Descriptive analysis compared the intervention and the control group with regards to the available demographic variables using *t*-tests for parametric data and Mann-Whitney for non-parametric data. Additionally, baseline values for PSS and WAI scores were

compared between the intervention and control groups using *t*-tests.

The change in PSS and WAI scores (from baseline to follow-up) were then calculated and compared with *t*-tests between the intervention and control groups. The association between the two measurements was calculated both as a correlation coefficient (Spearman's rank coefficient) and in a regression analysis. The change in perceived work ability was the dependent variable, and the change in perceived stress was the independent variable. The total number of exercise sessions was added as a covariate in the regression analysis. Data were analysed using SPSS, version 22<sup>32</sup>.

### 2.6. Compliance with ethical standards

All participants were informed about the study verbally and in writing, and signed informed consent forms prior to participation. Ethical permission was granted by the ethics committee at Karolinska Institutet: 2014/1452-31/1.

## 3. Results

A flow-chart can be found in Fig. 1 to explain the flow of participants through the study.

### 3.1. Recruitment

One of the three unit managers who had initially expressed an interest in the study declined to participate due to high workload, suggesting that “the study result therefore would be biased”. Thus, 2 workgroups made up the final study sample, leaving the recruitment rate at 2/5, or 40%. The work group nearest to both the lead investigator's office and a training facility was chosen to be the intervention group (60 employees) and the remaining group (21 employees) thus became the control group.

### 3.2. Eligibility

According to the initial question regarding stress,<sup>24</sup> there was no risk of floor effect at baseline for either group. No subjects were excluded due to pregnancy or participation in other types of stress-reducing treatment or activity; eligibility was thus perfect.

### 3.3. Willingness to participate

In total, 32 participants registered for the study: 17 (28% of target sample) in the intervention group and 15 (71% of target sample) in the control group, which put willingness to participate at 32/81 = 40%.

### 3.4. Response rates

Two subjects were removed from each of the groups due to incomplete baseline questionnaires, producing a response rate to the initial questionnaires of 87.5%, and a total of 15/13 subjects in the intervention/control groups respectively – 88% of the original sample. Furthermore, an additional two people in each group failed to complete the follow up-questionnaire, putting the response rate to the second questionnaires at 86%.

### 3.5. Adherence to the intervention plan

Compliance with the MY training was quite varied, and ranged from 2 sessions with the instructor plus 4 sessions at home (the individual who trained the least) to 9 sessions with the instructor plus 27 sessions at home (the individual who trained the most –

actually more than requested). Mean adherence to the intervention was 21 sessions in total, giving 21/27 = 78%.

### 3.6. Sample characteristics

The sample had a mean age of 51 years (SD 8.9) and included only one man; the intervention group consisted of some registered nurses (26.7%) but no assistant nurses, whereas the control group had no registered nurses and a relatively high proportion (38.5%) of assistant nurses. There were no statistically significant differences between the intervention and control groups regarding age, degree or type of employment and number of years at the current work place (results not shown); see Table 1 for details.

### 3.7. Stress and workability

Perceived stress was found to be equal between the two groups at baseline, and an improvement was noted in both groups over the nine weeks to follow-up; no significant difference ( $p=0.850$ ) in improvement between the groups was noted, however. Perceived work ability was slightly different between the two groups at baseline. The intervention group scored 38.60, which is classified as good work ability, whereas the control group scored 36.42, which is classified as moderate work ability. However, this difference was not statistically significant ( $p=0.766$ ). During the nine weeks of the study, both groups showed improvement in work ability. The change score was not statistically significant between the groups ( $p=0.404$ ). The results are found in Table 2.

A change in perceived stress was found to correlate significantly ( $p=0.03$ ) with a change in work ability ( $r=-0.582$ ), normally considered a moderate correlation.<sup>33</sup> In the regression analysis, the association was found to be significant ( $B=-0.43$ ,  $p=0.003$ ,  $CI:-0.69- -0.16$ ). The total number of MY sessions was introduced as a covariate in the regression analysis, but did not generate significant effects ( $p=0.141$ ).

## 4. Discussion

In this study, a workplace intervention with MY was tested among health care professionals to determine the feasibility of the intervention, as well as the perceived stress and work ability of the subjects. The major strength of this study was that it was pragmatic; it was delivered in two public health care units in the same county in Sweden. The data collection took place in parallel for both groups, rendering the effect of seasonal and organisational changes negligible. Restraints as regards research personnel, logistics and time made it difficult to conduct a full-scale randomized study. The identified difficulties are nevertheless those experienced in real-life situations.

### 4.1. Recruitment and sample

Recruiting participating work units and organizing the logistics of the intervention proved to be challenging. It was noted, primarily, that the unit managers approached were rather reluctant to donate their employees' time, which resulted in a convenience sample. Convenience samples are prone to selection bias, i.e. only managers with an interest in their employees' well-being or sufficient time to spare may have agreed to participate. The health care unit with the supposed strongest need for stress reduction was too busy to participate. The intervention and control groups differed in the composition of personnel, with many registered nurses and no assistant nurses in the intervention group, and no registered nurses and many assistant nurses in the control group. It is possible that due to the higher level of education in the intervention group, these individuals may have had a lighter physical

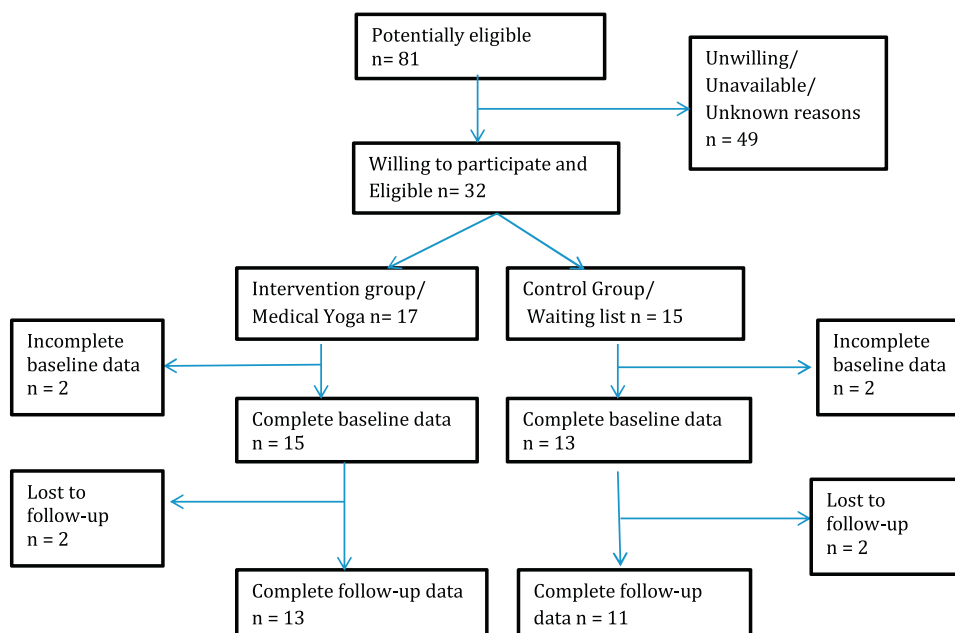


Fig. 1. The flow of participants in the study.

**Table 1**  
Descriptive statistics of the sample at baseline.

Variable	Total (n = 28)	Intervention (n = 15)	Control (n = 13)
Age, mean (SD)	51 (8.9)	54 (8.1)	47.5 (8.8)
<b>Profession,</b>			
Registered nurse, proportion	14.3%	26.7%	0%
Auxiliary nurse, proportion	67.9%	73.3%	61.5%
Assistant nurse, proportion	17.9%	0%	38.5%
Years at the workplace, mean (SD)	14.6 (8.8)	14.2 (9.6)	15.0 (8.1)
Degree of full-time employment, mean (SD)	74.1% (12.8)	74.2% (16.6)	74.0% (7.6)
<b>Type of employment</b>			
Permanent, proportion		100% (n = 15)	100% (n = 11)

**Table 2**  
PSS and WAI mean scores and standard deviations (SD) in the intervention and control groups at baseline and follow-up, the changes between the measures, test of difference between the groups and the confidence interval (CI) of the estimates.

Scores	Group	n	Mean (SD)	Test for differences <sup>a</sup>
PSS Baseline	Intervention	15	25.08 (7.207)	p = 0.714 CI: -6.06 to 6.07
	Control	13	25.08 (8.411)	
WAI Baseline	Intervention	15	38.60 (5.902)	p = 0.766 CI: -2.65 to 7.01
	Control	12	36.42 (6.244)	
PSS Follow Up	Intervention	13	17.62 (9.614)	p = 0.374 CI: -7.51 to 6.24
	Control	12	18.25 (6.566)	
WAI Follow Up	Intervention	13	39.17 (7.399)	p = 0.262 CI: -5.22 to 5.55
	Control	12	39.00 (5.360)	
PSS change	Intervention	13	-6.63 (6.413)	p = 0.850 CI: -2.48 to 7.02
	Control	12	-5.33 (5.614)	
WAI change	Intervention	13	-0.37 (5.093)	p = 0.404 CI: -2.32-5.34
	Control	11	-1.18 (3.545)	

<sup>a</sup> = T-test of difference in means between groups before and after the intervention.

work load and could better manage their stress. It could be argued, however, that the nurses have higher stress than other personnel due to greater responsibilities. As the groups were small, further subgroup analysis was deemed inappropriate.

The use of a waiting-list control group may also be problematic.<sup>34</sup> These participants had no interaction with the instructor and did not invest any time or effort into reducing their stress levels. However, as there were no significant differences in outcomes between the groups, the use of a waiting-list control group seemed to serve its purpose in this study.

#### 4.2. Eligibility and willingness to participate

The participation rate was rather low, despite obvious eligibility and room for stress reduction among the staff. It is a matter of concern for future interventions that less than 40% of the work group wanted to participate in an activity that was free and adapted to their work schedule. The initial information about the intervention was delivered by the unit managers, a method that may not be optimal and indeed could be perceived as a “top-down” approach. The intervention and control workgroups had different unit managers,

which could affect the subjects' willingness to participate, as well as their stress levels and work ability.

Information from the rest of the staff concerning stress and work ability was not collected, thus the general stress levels of the staff are not known. It is possible that the intervention reached those subjects in need of stress reduction, but it is also possible that the staff that needed it the most were too busy to participate.

#### 4.3. Response rates

The response rate to questionnaires and adherence to the MY training among the people who participated was satisfactory.

#### 4.4. Adherence to the intervention plan

Scrutinizing the intervention itself, scheduling the sessions at the end of a working shift may have been perceived as stressful, as the participants quickly had to get to the exercise facility. The intervention could possibly have been more successful if it took place at the workplace itself. Adherence to the intervention varied a great deal but the small sample makes further subgroup analysis impossible. The instructor noted which participants attended each supervised session. The number of home-exercises was measured weekly with an SMS tool to avoid memory bias, but participants may still have over-reported their compliance. The number of optimal weekly sessions was based on previous research,<sup>26</sup> but it may be speculated that the length of the intervention was too short for the full effects of MY to take place.<sup>35</sup> The fact that the MY instructor and the research assistant were the same person may have led to acquiescence bias, thus rendering self-rated measures concerning perceived stress, workability and compliance with exercise uncertain.

#### 4.5. Stress and workability

A strength of the study was the use of validated instruments to measure stress and perceived work ability. The PSS was chosen as both work-related and private stress was thought to be relevant, and the baseline values suggest that a stress-reducing intervention was indeed warranted. During the nine weeks of the study, perceived stress diminished and perceived work ability increased both in the intervention and the control groups. There were no statistical differences between the groups. Changes in perceived stress were found to correlate statistically to changes in perceived work ability.

There is the possibility of a floor effect in that the stress levels in both groups at inclusion were only moderate. In a similar study of MY that shows a stress-reducing effect, the PSS starting levels were considerably higher.<sup>12</sup> In a randomized pilot study of yoga in the workplace setting, however, the PSS levels were moderate and there was still a significantly larger decrease of stress in the intervention group.<sup>36</sup>

Concerning work ability, there could be a ceiling effect in the intervention group (reaching levels defined as "good", whereas the control group scored "moderate"), which could explain why low levels of improvement were observed.

#### 4.6. Limitations

The small sample size constitutes the major limitation as the data of one individual may substantially have affected the sample mean. The direction of perceived stress (diminishing) and perceived work ability (increasing) in the groups seem sensible. An explanation for the decrease in stress levels in both groups may have been that the information about stress provided at the introduction meeting made the participants aware of their stress management,

which may have prompted self-care strategies outside the control of the study. Further, many factors – both at the worksite and privately – may influence stress and work ability. No data were collected regarding work load, leadership, concomitant depression or other medical conditions that may have confounded the results.

The significant correlation of perceived stress and work ability is similar to that found in other studies.<sup>37,38</sup> Thus, the association found in previous cross-sectional studies was confirmed in this prospective study.

In conclusion, knowledge from this study could be used as a foundation when planning a larger scale study. The concerns raised about unit managers not prioritizing stress management should be explored further. A potential way forward could be qualitative interviews with the managers as well as the staff to investigate the reasons for the low penetration. The intervention may possibly need to be sanctioned from a higher organisational level. Care should be taken when planning the intervention in terms of information, availability, site and time of MY sessions as well as the length of the intervention and an independent instructor. When including subjects, information about health (like depression, chronic pain conditions etc.) should be collected to facilitate subgroup analysis. Additionally, the dilemma of measuring perceived work ability in conjunction with an intervention that may affect self-consciousness should be explored. To account for differences between workgroups in workload, professions etc., a randomized trial would be desirable.

#### Conflicts of interest

None.

#### Author's contributions

Both authors were involved in the design and analysis, and the presentation of data.

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