ERGONOMICS INTERVENTION REDUCES THE WORKLOAD OF HINDU PRIEST IN LEADING RELIGIUS CEREMONIES USING GENTA

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Abstract

In carrying out their duties, Hindu priests use Genta to deliver a ceremony that serves as a means of worship. A bell is an object or tool in the shape of an oval or like a high hat that is hollow and contains a clapper so that when this object is shaken, a sound will be generated. These clappers are generally made of metal, especially bronze, so they are strong and loud. The bell's weight used by the Hindu priest in Bali varies from 500 grams to 2000 grams. The sound produced will depend on the mixture of metals used to make the bell. This research uses the same subject design (treatment by subject design) with a sample size 18. The sampling technique for this study is simple random sampling using a random number table, where all samples are in the 1st period. Be a group that works on conditions and work environment that are not with ergonomic intervention and, in the 2nd period, become a group that works on conditions and work environment that have been improved ergonomically. The data obtained were analyzed using the Paired Sample T-Test at a significance level of 5%. The results showed that with ergonomics intervention, there was a decrease in fatigue by 36.24% ($p \leq 0.05$), a decrease in musculoskeletal complaints by 37.98% ($p \leq 0.05$), a decrease in workload by 13.22% ($p \leq 0.05$) increased productivity by 78% ($p \leq 0.05$). It was concluded that improving working conditions and environments with ergonomics interventions through the application of participatory and total ergonomics approaches could increase the efficiency of Hindu priests in leading a ceremony using Genta either by decreasing workload categories, decreasing musculoskeletal complaints, decreasing fatigue levels, and increasing productivity.

Keywords: Ergonomic Intervention, Hindu Priest, Genta.

INTRODUCTION

In carrying out their duties, Hindu priests use a bell to deliver a ceremony that functions as a means of worship. Genta is an object or tool in the shape of an oval or a high hat that is hollow and contains a clapper so that a sound will arise when this object is shaken. The word Genta comes from the Sanskrit Ghanta, which means bell. The body and top of the Genta can be decorated with any decoration, such as leaves, flowers, curved lines, or animal decorations, such as lions, elephants, dragons, and others. At the top of the Genta can be given a handle, either as a hanging hole or a rod. These Genta are generally made of metal, especially bronze, so they are strong and loud. The bell's weight used by the Hindu priest in Bali varies from 1000 grams to 2000 grams. The sound produced will depend on the mixture of metals used to make the bell.

A preliminary survey in Denpasar regarding the use of Genta by Hindu priests obtained the following description:

The task demands that a Hindu priest worship and use Genta as a means is as follows: a 2-week survey of the priest who performs the ceremony is between 28-35 minutes.

The physical workload of a Priestman is sitting cross-legged and holding the bell with his ring finger and middle finger. This hand position can cause muscle problems due to the exertion of muscle strength in the middle and ring fingers, and the weight of the bell will increase the muscle burden in the hand.

Work organization. In every yadnya ceremony in Bali, there are traditionally known three things in the organization, namely: Yajamana (who will lead and the ceremony = Spiritual), Tapini (who is responsible for all the yadnya ceremonies), and the Adruwe Karya (who owns the ceremony).

The physical work environment when leading the ceremony is working outdoors with temperatures ranging between 25s.d. 29o C. Sit-down position, cross-legged, cross-legged This is done not only briefly but can last for hours with an unnatural working attitude. This posture will accelerate the onset of muscle fatigue, localized in the leg muscles, back muscles, or muscles. Waist and discomfort for workers. All muscle fatigue will become body fatigue and affect the body's resistance, so it becomes a form of spontaneous rest or stolen rest. This can be seen in the form of a decreased work rhythm. This posture cannot be maintained for a long time, so there will be a change in posture, and automatically, the change in posture will prolong the time to complete the task.

5) . In the survey, there was a significant increase in fatigue scores at the end of work, namely 51.20 ± 3.96. The priest felt pain in the hands, arms, and fingers, which significantly increased (56.00±4.06; p<0.05)

The ergonomics intervention that will be carried out with a participatory approach is that everyone involved in solving the problem must be involved from the start maximally so that a conducive working mechanism can be realized and quality products are obtained following the demands of the times (Manuaba, 2003a; b). Participation involves a person's physical, mental, and emotional thoughts and behavior in a group activity situation. It seeks that everyone contributes equally to determining group results and conveying their responses (Manuaba, 2001). Based on this statement, it can be said that participatory ergonomics is a person's active participation by placing ergonomics as a reference, taking into account a holistic approach, and striving so that a person in his activities is always in a healthy, safe, comfortable, effective and efficient condition to achieve the highest productivity.

METHODS

Subject

The study populations were chosen from DENPASAR HINDU PRIEST COMUNITY denpasar Hindu Priest, who led the Hindu ceremony using Genta in the age range of 38-45 years old. The samples were chosen randomly, and the number of the samples was determined by Colton's (1974) Sampling method. From the 127 populations, 18 male priests were selected as samples in this Study. Approval was received from the head of DENPASAR HINDU PRIEST COMUNITY before conducting this Study. Informed consent was given to all of the participants, and explained to all of the participants that the data obtained would be used only for research. The Study carried on after receiving agreement from the participants.

Parameter

A thermometer (MC, Japan) measured the workplace's temperature. Humidity was measured by using a Psychometric chart. The subject's anthropometric was measured using an Anthropometer (Super 686, Japan). A Luxmeter (Gosen et al. 2, Germany) was used to measure light exposure, and Anemometer (Lutron AM-4201, Taiwan) was

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used to measure wind velocity. The subjects' body weight is measured using a Scale (Elephant, Japan) with 0.2kg accuracy.

Questionnaire

Three questionnaires were used to assess this study, namely, the Nordic Body Map questionnaire that had been modified with a 4-point Likert scoring for measuring musculoskeletal problems, 30 items of a rating scale with Likert scoring was used to evaluate fatigue levels, and a modified Boredom questionnaire with Likert scoring that was used to measure the boredom level of the participant.

RESULT AND DISSCUSION

The descriptive statistical analysis results, which include the mean, standard deviation, and range of the variables of age, weight, height, and body mass index, are presented in Table 1.

Table 1: Physical Characteristic of the Subject

No	Parameter	n	Mean	Standard Deviation	Range
1	Age (year)	18	40.94	0.938	40-42
2	Weight (kg)	18	51.56	8.354	40-68
3	Height (cm)	18	159.56	6.176	152-174
4	Body Mass Index (BMI)	18	19.94	1.955	17-24

Table 2 shows the results of participant anthropometric measurements with descriptive statistics. Anthropometric measurements in this study were sitting anthropometry, when the subject was measured in an upright sitting position. Anthropometric data is used to determine the suitability of the tools used in the process of leading religious ceremonies using Genta.

Table 2: Subject Anthropometric Data

No	Standing Position Measurement	n	Mean (cm)	Standard deviation	Percentile -5	Percentile -50	Percentile -95
1	Reach Up	18	156.30	4.562	151.76	154.65	165.54
2	Sit height	18	125.12	1.491	122.0	124.80	126.88
3	Eye height	18	113.91	1.251	111.60	113.80	115.57
4	Shoulder height	18	53.33	1.434	35.00	38.40	44.67
5	Waist height	18	18.39	2.958	11.20	19.45	21.26
6	Elbow height	18	19.52	2.575	14.30	19.50	43.40
7	Knee height	18	51.44	1.574	47.00	51.50	52.18
8	Popliteal height	18	41.37	1.475	40.00	40.90	43.81
9	Thigh thickness	18	10.87	1.394	8.80	10.60	12.68
10	Shoulder width	18	39.46	3.046	35.00	38.40	44.67
11	Elbow to fingertip range	18	43.54	2.211	40.00	42.40	46.81

Prior to the parametric test with *paired t-test*, normality was tested with the *Kolmogorov-Smirnov* test (k-s) at a significance level of 0.005. From the K-S test, it was found that all data including data on work environment, workload, musculoskeletal complaints, and fatigue in both treatments were normally distributed ($p>0.005$). Briefly, the results of the *Kolmogorov-Smirnov* test are presented in table 3.

Table 3: Analysis of data normality test with *Kolmogorov-Smirnov* test (K-S)

No	Parameter	-*p* value *K-S (0.05)*	
		P0	**P1**
1	Temperature	0.988	0.833
2	Humidity	0.272	0.573
3	Wind velocity	0.272	0.573
4	Light exposure	0.682	0.681
5	Resting Pulse	0.012	0.55
6	Working pulse	0.322	0.149
7	Increase in work pulse	0.30	0.293
8	Recovery pulse	0.017	0.008
9	Musculoskeletal Problem 1	0.176	0.322
10	Musculoskeletal Problem 2	0.747	0.106
11	Fatigue 1	0.303	0.34
12	Fatigue 2	0.124	0.661
13	Fatigue difference	0.102	0.22
14	Work load	0.967	0.602
15	Productivity	0.573	0.417

P0: Before ergonomic intervention

P1: After ergonomic intervention

p>0,05 (no different meaning)

The microclimate was measured every hour, namely 6 times during the study time from 10.00 to 15.00. The results of the analysis of microclimate data which include the mean, standard deviation and p-value of the *paired t-test* are presented in table 4. Furthermore, from the *paired t-test* of microclimate data (air temperature, humidity, *Wind velocity*, light intensity and noise) in both treatments did not significantly different (p>0.05). To determine differences in environmental conditions, paired samples T test (t) was used with the following hypothesis: H0 = environmental conditions with different meanings; and H1 = environmental conditions do not differ in meaning. In this case, a 2-way (2-tailed) test was carried out with *a* = 0.05. The decision accepts H0 if the value of t>t(a/2) and the value of *Sig.(2-tailed)* < 0.025. Work environment data as in Figure 1.

Table 4: Work Environment Data

No	Parameter	P0		P1		-*t* Value	-*p* Value
		Mean	**SD**	**Mean**	**SD**		
1	Temperature (C°)	25.50	1.046	25.50	1.046	0.791	0.466
2	Humidity (%)	72.33	0.516	72.50	0.548	0.542	0.611
3	Wind velocity (m/s)	0.19	0.005	0.18	0.005	1.00	0.363
4	Light intensity	210.50	0.837	210.33	1.003	0.349	0.741

P0: Before ergonomic intervention

P1: After ergonomic intervention

p>0,05 (no different meaning)

The air temperature data analysis results are (a) the air temperature in the period I condition is 25.50 °C with a standard deviation of 1.049 C. The mean air temperature in condition period II is 26.17 °C with a standard deviation of 0.753 °C, (b) from the results of One-Sample KS The test shows the value of Sig. (2-tailed) = 0.988 in the old workplace and 0.833 in the second period, all > 0.005. The decision to accept H0 means that the air temperature data is normally distributed; (c) because the data is normally distributed, then the paired sample test is used for the different test, with the following hypothesis: H0 = there is no significant difference between the mean air temperature in the conditions of period I and the conditions of period II and H1 = there is a significant difference between the mean temperature air in period condition I with period II conditions. The paired samples test shows the value of Sig. (2-tailed) = 0.465>0.005, and (d) the decision H0 is accepted. There is no significant difference between the mean air temperature in period I conditions and period II conditions. It means that the air temperature in period II is not different from the air temperature at the old workplace conditions.

Air humidity was measured 6 times during the study. The results of the air humidity data analysis are: (a) the mean air humidity in period I conditions 72.33% with a standard deviation of 0.516%, the mean air humidity in period II conditions is 72.50% with a standard deviation of 0.548%, (b) results One -Sample KS Test shows the value of Sig (2-tailed) = 0.272 in the old workplace conditions, and 0.573 in the period II conditions, all > 0.005. The decision H0 is accepted, meaning that the humidity data is usually distributed; (c) because the data is normally distributed, then the different test is used paired samples test, with the following hypothesis. H0 = there is no significant difference between the mean air humidity in the conditions of period I and the conditions of period II, and H1 = there is a significant difference between the mean air humidity in period I and period II conditions. The paired samples test shows the value of Sig. (2-tailed) = 0.611> 0.005, and (d) the decision H0 is accepted, and there is no significant difference between the mean air humidity in periods I and II.

The results of wind velocity data analysis are (a) the mean wind velocity in the period I conditions is 0.19 meters/second with a standard deviation of 0.005 meters/second, the mean wind velocity in period II conditions is 0.18 meters/second with a standard deviation of 0.005 meters/second; (b) the results of the One Sample K-S Test showed Sig. (2-tailed) = 0.272 in the old working conditions and 0.573 in the new working conditions, all > 0.005. Decision H0 is accepted, it means that the wind velocity data is usually distributed; (c) because the data are normally distributed, the paired T Samples Test is used for a different test, with the following hypothesis: H0 = there is no significant difference between the mean wind velocity in the conditions of period I and the conditions of period II, and H1 = there is a significant difference between the mean wind velocity in the conditions of period I with the conditions of period II. The result of paired Samples Text shows the value of Sig. (2-tailed) = 0.363 > 0.005; (d) the decision H0 is accepted. There is no significant difference between the mean wind velocity in period I and period II conditions.

The results of the analysis of the light intensity data are: (a) the mean light intensity in the period I condition is 210.50 lux with a standard deviation of 0.837 lux, the mean light intensity in the period II condition is 210.33 lux with a standard deviation of 0.408 lux; (b) the results of the One-Samples KS Test show Sig. (2-tailed) = 0.682 in the old workplace conditions, and 0.681 in period II conditions, all > 0.025 H0 decision is accepted, meaning that the Wind velocity data is usually distributed, (c) because the data is normally distributed. The difference test is used as a paired samples test, with the following hypothesis: H0 = there is no significant difference between the mean light intensity in the condition of period I and the condition of period II, and H1 = there is a significant difference between the light intensity of the condition of period I and the condition of period II. The results of the paired samples test show the value of Sig. (2-

tailed) = 0.741>0.005, and (d) the decision H0 is accepted. There is no significant difference between the mean light intensity in periods I and II. This means that the light intensity in period II conditions is not different from the light intensity in the old workplace conditions.

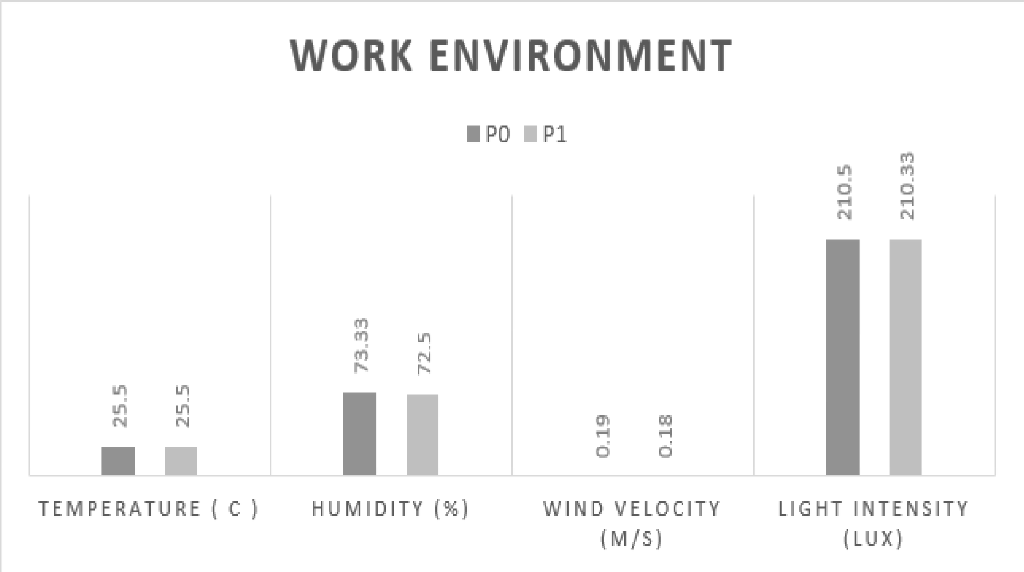

Figure 1

Workload

Before starting work on each work treatment, all subjects were counted resting pulse. The pulse rate variables measured in this study were resting pulse rate (DNI), working pulse rate (DNK) and increased working pulse rate (PDNK). To determine the spread of pulse data, the *One Sample K-S Test* was used, with the following hypothesis H0 = pulse data was normally distributed, and H1 = pulse data was not normally distributed. With a = 0.05 the decision to accept H0 if the value of *Sig.(2-tailed)*>0.005. To find out the difference in pulse rates, a different test was carried out with Paired Sample Tests with the following hypotheses H0 = pulses with different meanings, and H1, = pulse does not differ in meaning. With a = 0.05 the decision to accept H0 if the value of Sig (2-tailed) > 0.005.

It turned out that with the *paired t-test*, the resting pulse rate between the two treatments was not significantly different (p>0.05), meaning that the initial conditions were the same. Furthermore, when the subject is doing work, the pulse is calculated. With the *paired t-test*, the mean working pulse rate was significantly different between the two treatments (p<0.05). In summary, the analysis of the t-paired resting pulse and working pulse is presented in table 5.

Table 5: Analysis of the T-Paired Resting Pulse and Working Pulse

Variable	n	P0		P1		-*t* Value	-*p* Value
		Mean	SD	Mean	SD		
Resting Pulse (bpm)	18	74.44	0.616	74.56	0.784	0.622	0.542
Working Pulse (bpm)	18	110.89	0.784	96.22	1.606	54.699	0.000*
Working pulse increment (bpm)	18	36.44	1.464	21.72	1.464	35.173	0.000*
Pulse recovery (2 mnt)	18	82.06	1.349	78.29	0.312	17.237	0.000*
Pulse recovery (5 mnt)	18	74.56	0.511	74.39	0.502	1.144	0.263

P0: Before ergonomic intervention

P1: After ergonomic intervention

*: p<0,05 (different meaning)

bpm: beat per minute

The resting pulse rate was measured at the wrist using the 15-second palpation method. Measurements were carried out for 6 days at old and 4 days at new conditions. The results of the analysis can be explained as follows: (a) the mean resting pulse rate for period I is 74.44 beats/minute with a standard deviation of 0.616 beats/minute, and the mean resting pulse rate for period II is 74.56 beats/minute with a standard deviation of 0.784 beats/minute. ; (b) The results of the one Sample K-S Test show the value of Sig. (2-tailed) = 0.012 in the old workplace condition and 0.55 in the period II condition, all >0.005. Decision H0 is accepted, it means that resting pulse data is usually distributed; (c) because the data is normally distributed, then the Paired Sample Test is used, with the following hypothesis: H0 = there is no significant difference between the mean resting pulse rate in the conditions of period I and the condition of period II, and H1 = there is a significant difference between the mean resting pulse rate in the conditions of period I and the condition of period I period II. Paired Samples Test results show the value of Sig. (2-tailed) = 0.542 > 0.005; and (d) the decision H0 is accepted. There is no significant difference between the mean resting pulse rate in periods I and II. This means that the resting pulse rate in period II is not different from the resting pulse rate in the condition of the old workplace.

The working pulse was measured at the neck using the 10-beat palpation method. Suppose the pulse rate is < 75 beats/minute = very light workload category, > 75-100 beats/minute = light workload category, > 100 - 125 beats/minute = moderate workload category, 125 - 150 beats/minute = heavy workload category, >150-175 beats/minute = very heavy workload category, and > 175 beats/minute = extreme heavy category. The results of the work pulse analysis can be explained as follows: (a) the mean working pulse in period I conditions is 110.89 beats/minute with a standard deviation of 0.758 beats/minute in the medium workload category, and the mean working pulse rate in period II conditions. 96.22 beats/minute with a standard deviation of 1.060 beats/minute, in the light workload category (b) the results of the One-Sample KS test show the value of Sig. (2-tailed) 0.32% in old workplace conditions and 0.146 in period II conditions. All> 0.005. Decision H0 is accepted, it means that resting pulse data is usually distributed; (c) because the data is normally distributed, then the Paired-Sample Test is used for a different test, with the following hypothesis: H0 = there is no significant difference between the mean working pulse in the condition of period I and the condition of period II, and H1 = there is a significant difference between the mean working pulse on the condition of period I and the condition of period II. Paired-sample test results show Sig. (2-tailed) = 0.000<0.005; and (d) the decision H0 is rejected, there is a significant difference between the mean working pulse in period I and period II. It means the working pulse in the period II condition is smaller than at the old workplace.

The measurement of the working pulse increment rate from the analysis can be explained as follows: (a) the mean of the working pulse increment rate in the period I condition is 36.44% with a standard deviation of 1.464%, the mean in the period II condition is 21.72% times/day with a standard deviation of 1,274 % ; (b) the results of the One-Sample K-S test analysis show the value of Sig. (2-tailed) in the condition period I = 0.30 and in the condition period II = 0.293 all > 0.005. the decision H0 is accepted, it means that the data on the working pulse increment rate is normally distributed; (c) Since the data are normally distributed, a different test is used Paired-Sample Test, with the following hypothesis: H0 = there is no difference between the working pulse increment rate in the condition of period I and the condition of period II, and H1 = there is a difference between the deviation of the pulse rate work in the conditions of period I with period II. The Paired-Sample Test shows the value of Sig. (2-tailed) = 0.000<0.005; and (d) the decision H0 is rejected, there is a significant difference between the work pulse increment in period I and period II. This means that the increase in the working pulse rate in period II conditions is lower than in the old workplace conditions.

Recovery pulse rate is calculated from when an activity is completed to the pulse rate at rest. From the first decrease until it reaches the initial condition, it is explained as follows: the first measurement is carried out at the 2nd minute, and the subsequent measurement is carried out at the 5th minute. (a) The mean recovery pulse rate in the 2nd minute in the condition period I is 82.89 beats/minute with a standard deviation of 1.132 beats /minute. The mean pulse rate for recovery in period II was 78.29 beats/minute, with a standard deviation of 0.312 beats/minute. The mean recovery pulse in the 5th minute in the period I condition was 74.56, with a standard deviation of 0.592 beats/minute. The mean increase in work pulse in new workplace conditions is 74.39 with a standard deviation of 0.502 beats/minute (b) The results of the *One-Sample K-S* Test analysis show the value Sig (2-tailed) recovery pulse at minute 2 was explained as follows: in the period I condition = 1.109 and in the period II condition = 0.717 all > 0.005. The decision H0 is accepted, meaning the data on the increase in work pulse is usually distributed. The results of the *One-Sample K-S* Test analysis show the value of *Sig. (2-tailed)* the recovery pulse at 5 minutes was explained as follows: in the period 1 condition = 1.541 and the period II condition = 0.008, all > 0.005. Decision H0 is accepted, which means recovery pulse data is normally distributed (c) because the data is normally distributed, then the *Paired-Samples Test* is used for a different test, with the following hypothesis: H0 = there is no difference between the increase in work pulse in the conditions of period I and period II conditions, and H1 = there is a difference between deviations working pulse in period I conditions with period II conditions. From the *Paired Sample Test*, the recovery pulse in the 2nd minute shows the value of *Sig. (2-tailed)* = 0.000<0.005; and (d) the decision H0 is rejected, there is a significant difference between the recovery pulse in period I and period II. The Paired Sample Test on the 5th-minute recovery pulse shows the value of *Sig. (2-tailed)* = 0.269>0.005; and (d) the decision H0 is accepted, there is no significant difference between the recovery pulse rate in periods I and II.

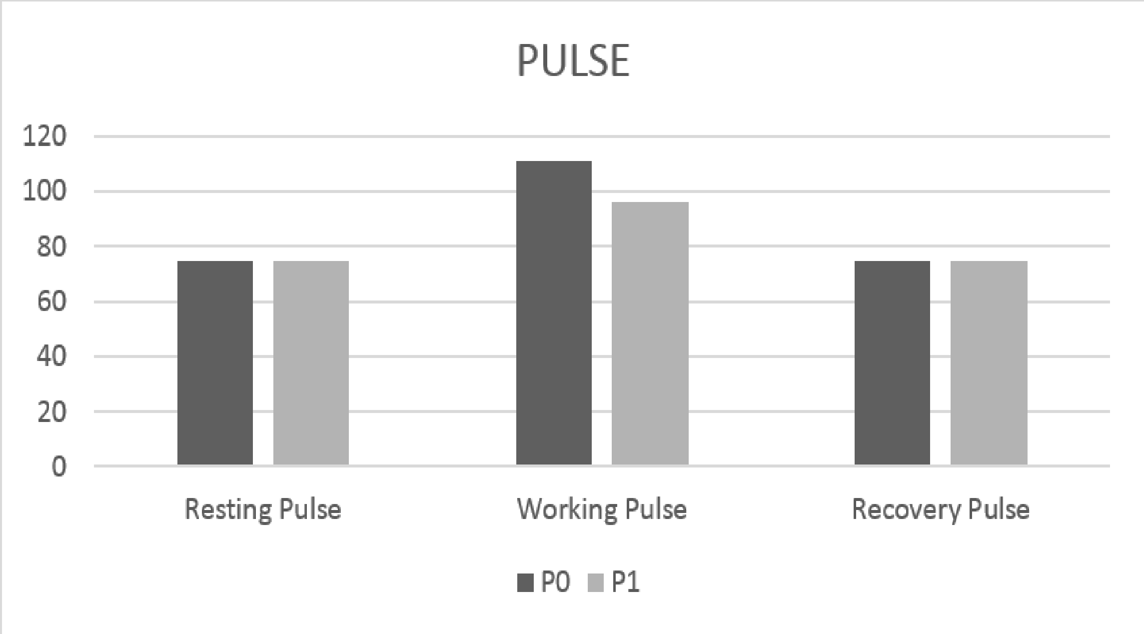

Figure 2

Nordic Body Map Questionnaire

Before starting work on each job treatment, all subjects filled out the Nordic Body Map questionnaire. NBM questionnaire was used to measure musculoskeletal complaints subjectively. If the mean value of the answers to the NBM questionnaire < 1.50 means the level of complaints is mild, > 1.50-2.00 means the level of complaints is moderate, > 2.00-3.00 means the level of complaints is high, and > 3.00 means the level of complaints is very high.

With *the paired t-test* the mean musculoskeletal complaints pretest between the two treatments was not significantly different (p>0.05). After the subject finished doing the work, it turned out that with the paired t-test the mean posttest musculoskeletal complaints between the two treatments were significantly different (p<0.05). Likewise, the mean difference in musculoskeletal complaints between the posttest-pretest treatments was significantly different (p<0.05). In summary, the paired t-test analysis of musculoskeletal complaints is presented in Table 6.

Table 6: The Paired T-Test Analysis of Musculoskeletal Complaints

No	Variable	n	P0		P1		-*t* Value	-*p* Value
			Mean	SD	Mean	SD		
1	Musculoskeletal issue prior to work	18	29.22	0.943	29.11	0.758	0.325	0.749
2	Musculoskeletal issue at the end of work	18	53.11	0.606	30.94	1.056	36.621	0.000

P0: Before ergonomic intervention

P1: After ergonomic intervention

*: p<0,05 (different meaning)

PPM: pulse per minute

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The results of the analysis of the answers to the initial work NBM questionnaire are explained as follows: (a) the mean number of answers to the initial work NBM questionnaire in the period I conditions is 29.22 with an mean answer score of 1,082 means in the category of mild complaints; (b) the mean number of answers to the NBM questionnaire at the beginning of work in new working conditions is 29.11 with an mean answer score of 1,078 which means in the category of mild complaints; (c) the results of the One-Sample K-S Test analysis show the value of *Sig.(2-tailed)* in the condition period I = 0.176> 0.005 and in the condition period II = 0.322 all > 0.005. Decision H0 is accepted, it means that the answer data for the initial NBM questionnaire work is normally distributed; (d) because the data is normally distributed, the different test is used *Paired-Sample Test* with the following hypothesis: H0 = there is no significant difference between early work musculoskeletal complaints in period I and period II conditions, and H1 = there is a significant difference between complaints early musculoskeletal work in period I conditions with period II conditions. The *Paired-Sample Test* shows the value of *Sig.(2-tailed)* = 0.454>0.005; and (e) the decision H0 is accepted, there is no significant difference between the answers to the NBM questionnaire at the beginning of work in the conditions of period I and period II. This means that early work musculoskeletal complaints in period I conditions are no different from early work musculoskeletal complaints in period II conditions.

The following is a graph of the measurement of musculoskeletal complaints at the end of work. The results of the analysis of the answers to the end-of-work NBM questionnaire are explained as follows: (a) the mean total score of answers to the questionnaire in the period I condition is 53.11 with an mean answer score of 1.96 which means that it is in the moderate complaint category; (b) the mean total score of answers to the questionnaire in the second period is 30.94 with an mean answer score of 1.14 which means that it is in the category of mild complaints; (c) the results of the One-Sample K-S Test analysis show the value of *Sig.(2-tailed)* in the condition period I = 0.747 and in the condition period II = 0.106 all > 0.005. The decision H0 is accepted, which means that the NBM questionnaire answer data at the end of work is normally distributed; (d) because the data is normally distributed, then the different test is used *Paired-Sample Test*, with the following hypothesis: H0 = there is no significant difference between end-of-work musculoskeletal complaints in period I and period II conditions, and H1 = there is a significant difference between end-of-work musculoskeletal complaints in period I and period II conditions. The Paired Sample Test shows the value of *Sig.(2-tailed)* = 0.000<0.005; and (e) decision H0 is rejected, there is a significant difference between end-of-work musculoskeletal complaints in period I and period II conditions. It means that musculoskeletal complaints in period II conditions are smaller than those in the old workplace. From the results of filling out the NBM questionnaire in each part of the skeletal muscles, the most complaints occurred in the waist, namely 79% and complaints in the back, namely 74.5%.

Questionnaire of 30 items of fatigue

Questionnaire of 30 items of fatigue symptoms used to determine the level of fatigue subjectively. If the mean value of the Questionnaire answers < 1.50 means not tired, > 1.50-2.00 means somewhat tired, > 2.00-3.00 means tired, and > 3.00 means very tired.

Table 7

No	Variable	n	P0		P1		-t Value	-p Value
			Mean	SD	Mean	SD		
1	Fatigue before work P0 and P1	18	30.89	2.494	31.11	0.758		0.172
2	Fatigue after work P0 and P1	18	61.00	0.686	38.89	0.900		0.000

P0: Before ergonomic intervention

P1: After ergonomic intervention

*: p<0,05 (different meaning)

ppm: pulse per minute

The results of data analysis on early work fatigue are explained as follows: (a) the mean number of answers to the questionnaire on early work fatigue in period I conditions is 30.89 with an answer score of 1.02 which means that it is in the tired category; (b) the mean number of answers to the questionnaire on early work fatigue in the period II condition is 31.11 with an mean answer score of 1.03 which means that it is in the category of not being tired; (c) the results of the One-Sample Test K-S analysis show the value of Sig.(2-tailed) in the old working conditions = 0.303 and in the new working conditions = 0.034 all > 0.005. Decision H0 means that the data on the answers to the questionnaire on early work fatigue are normally distributed; (d) because the data is normally distributed, then the different test is used Paired Sample Test, with the following hypothesis: H0 = there is no significant difference between the answers to the early work fatigue questionnaire in the conditions of period I and period II, and H1 = there is a significant difference between answers to the questionnaire on early work fatigue in the conditions of period I and period II. The Paired Sample Test shows the value of Sig.(2-tailed) = 0.331>0.005; and (e) Decision H0 is accepted, there is no significant difference between early work fatigue in period I and period II.

The results of the analysis of the final work fatigue data are explained as follows: (a) the mean number of answers to the initial work fatigue questionnaire in period I conditions is 161.00 with an answer score of 2.03 which means that it is in the tired category; (b) the mean number of answers to the questionnaire on early work fatigue in the condition period II was 38.86 with an mean answer score of 1.29, which means that it is in the category of not being tired; (c) the results of the One-Sample Test K-S analysis show the value of Sig.(2-tailed) in the period I condition = 0.124 and in the new working condition = 0.661 all > 0.005. The decision H0 is accepted, meaning that the data on the answers to the final fatigue questionnaire are normally distributed; (d) because the data is normally distributed, then the different test is used Paired Sample Test, with the following hypothesis: H0 = there is no significant difference between the answers to the end-of-work fatigue questionnaire in the conditions of period I and period II, and H1 = there is a significant difference between the answer to the questionnaire on end-of-work fatigue in the conditions of period I and period II. The Paired Sample Test shows the value of Sig.(2-tailed) = 0.000<0.005; and (e) Decision H0 is rejected, there is a significant difference between end-of-work fatigue period I and Period II. The fatigue condition of Period II was lower than the old workplace condition.

Work Productivity

The results of work or output, namely the results of the calculation, the average work result for 5 hours of work on work treatment without ergonomic intervention is 32.00 and on work treatment with ergonomic intervention is 57.00. With the paired t-test, the mean work results between the two treatments were significantly different (p<0.05). The input used in calculating productivity is the average pulse of group work. The average pulse of the work group in the work treatment without ergonomic intervention was 110.89 beats/minute and in the work treatment with ergonomic intervention it was 96.22 beats/minute. With the paired t-test, the mean working pulse of the groups between the two treatments was significantly different (p<0.005). Productivity is a comparison between the results of work and the pulse of work per unit time. From the results of the calculation of productivity, the average work treatment without ergonomic intervention and work treatment with ergonomic intervention showed an increase in productivity of 78%.

Table 8

No	Variable	n	P0		P1		-*t* Value	-*p* Value
			Mean	SD	Mean	SD		
1	Work result	18	21.33	10.387	22.00	2.217	15.625	0.001*
2	Work pulse	18	110.89	0.758	96.22	1.060	25.570	0.000*
3	Productivity	18	32.00	5.774	57.00	5.000	15.000	0.001
4	Material use	53	376.91	938.848	202.98	599.456	3.476	0.001

Subjects' Responses to the Ergonomics Intervention

Subject responses were measured by the SHIP approach questionnaire. If the mean score of the questionnaire answers <2.50 means not happy, >2.50-3.50 means happy, and >3.50 means very happy. Of the 18 subjects very happy with the SHIP approach with an average score of 3.89 on the questionnaire answers as described below.

Table 9

	n	Minimum	Maximum	Mean	SD
SHIP	18	3	4	3.67	.485
Response of changes	18	3	4	3,89	.323
Participatory	18	4.00	4.00	4.0000	.00000
Valid N (listwise)	18				

CONCLUSION

Based on the results of the research and discussion, the following conclusions can be drawn: (a) ergonomic intervention for Hindu Priest leading the ceremony using bells increased work efficiency by 36.24% ($p<0.005$) or from tired to not tired; (b) ergonomics intervention increases efficiency as seen from the decrease in musculoskeletal complaints of Hindus who lead religious ceremonies using bells by 37.98% ($p<0.005$) or from sick to not sick; (c) ergonomic intervention can reduce the workload of Hindu priests who lead ceremonies using bells by 13.22% ($p<0.005$) or from a moderate workload to a light workload.

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