Effect of an 8-Week Whole Body Vibration and Stretching Exercise on Low Back Pain among Law Enforcement Corps in Ibadan, Oyo State, Nigeria

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This study investigated the effectsof an 8-week whole body vibration and stretching exercise on low back pain among law enforcement corps in Ibadan Oyo State, Nigeria. Ninety law enforcement corps were divided into three groups of two experimental and one control group. The experimental groups' went through 8-week whole body vibration and stretching exercise, while the control group were placed on 8-week Fitness talk. Data was analyzed using both Descriptive andAnalysis of Co-variance**.**The study revealed that there was significant main effect oftreatment ofWhole body vibration, stretching exercise and control on low back pain($F_{(4,87)}$= 74.405, $p<0.05$, η^2=0.634), also, there was significant main effect of whole body vibration on low back pain($F_{(2,86)}$= 45.409, $p<0.05$, $?^2$=0.514). Also, there was significant main effect of stretching exercise on low back pain ($F_{(2,86)}$= 6.601, $p>0.05$, η^2 = 0.133), however, there was no significant main effect of treatment and gender on low back pain($F_{(2,83)}$ = 0.011, $p<0.05$, η^2 = 0.00). Finally, there was a significant main effect of treatment, gender and age on low back pain($F_{(6,84)}$ = 6.723, $p<0.05$, η^2 = 0.170). It was concluded that whole body vibration was more effective than stretching exercise on low back pain**.** The researcher recommends that Federal, state government and stakeholder should support and fund law enforcement corps due to the nature of their work regular provision of kits, also, training and re-training on stretching exercises and whole body vibration on ameliorating the effect of low back pain**.**

Keywords: Whole Body Vibration, Low Back Pain, Law Enforcement Corps

Introduction

Low back pain (LBP) is a considerable health problem in all developed countries and is most commonly treated in primary healthcare settings. It is defined as pain, muscle tension, or stiffness located below the costal margin and above the inferior gluteal folds, with or without leg pain

(sciatica). The most important symptoms of non-specific low back pain are pain and disability. The diagnostic and therapeutic management of patients with low back pain has long been characterized by considerable variation within and between countries among general practitioners, medical specialists, and other healthcare professionals.

Low back pain is becoming more common all over the world. It is rising as a result of the world's ageing and expanding population. Since 1990, the number of years lived with disability due to low back pain has increased by more than 50%, notably in low- and middle-income nations (Clark &Horton, 2018). It is associated with smoking, obesity, sedentary occupations, low socioeconomic level, poor quality of life, and insufficient resources in general. Disability and expenditures from low back pain will rise in the future in low- and middle-income nations, particularly where health systems are fragile and cannot cope with this growing burden ([2]HartvigsenJ, et.al, 2018). Low back pain is a major source of morbidity in the developed world, affecting both work and leisure activities. The most common cause of activity limitation in the adult population was discovered to be low back pain (Vassilaki& Hurwitz, 2014). It is estimated that 5% of the population in developed countries suffers with low back pain (LBP) at any given moment, with an annual prevalence of 15-45% (Waxman, Tennant, & Helliwell, 2015). It is estimated that 60 - 80% of the population will suffer from low back pain at some point in their lives, with LBP being the second leading cause of medical visits (after cardiovascular problems), as well as the third leading cause of hospital visits and the fifth leading cause of surgical procedures[1]. Muscle strain is the most commonly recognized cause of LBP, with overexertion and irregular (rapid, incorrect) motions such as lifting, twisting, turning, bending, pushing, and pulling being common underlying variables (Ying, X., Bach, E., & Orhede,2017).

According to (Hiroshige K, Mahbub MH, Harada, 2014), whole body vibration is a quick, oscillatory movement. It was first used medically in the Soviet Union to prevent cosmonaut hypotonia. Initially utilised in segmental form, it evolved to whole body vibration using machines, with overall effect (Lora, Granados, Corrales & Páez, 2019). Whole body vibration (WBV) is an alternative to resistance training because it stimulates muscle receptors via the vibratory tonic reflex (Tseng SY, et.al, 2016). Whole body vibration (WBV) consists of the transfer of relatively low frequency ambient vibration to the human body via a broad contact area (Adegoju, Abon, & Olatoomirin,2021). These frequencies range from 0.5 to 80 Hz. When in touch with a vibrating surface, transmission occurs through the feet when standing, the buttocks when sitting, or the reclining torso (Adegoju, Abon, & Olatoomirin,2021). This response is produced by muscle and tendon oscillation, which causes modest and rapid changes in muscle-tendon unit length. These alterations are then sensed by muscle spindles, which try to avoid muscular stretching by contracting reflexively (Lora, Corrales & Páez LC, 2010).

The high frequency and low amplitude vibration boosts gravity force through acceleration variations, which benefits bone morphology and promotes muscular toning. This vibration mode can be employed by groups with low tonus and movement, such as the elderly (FMLam, et.al, 2018).

Furthermore, as an intervention strategy, whole body vibration (WBV) training can treat chronic low back pain (CLBP). WBV settings have varying effects on lumbar-abdominal muscle performance. There has been little research on the effect of WBV training on patients with CLBP measured by lumbar-abdominal muscle activation. As a result, it investigates how WBV and exercise, as well as their interactions, influence lumbar-abdominal muscle activity in CLBP patients. In patients with CLBP, adding whole body vibration to exercise may promote lumbar-abdominal muscle activation. 15 Hz is the ideal frequency for lumbar-abdominal muscles. Plank for multifidus and erector spinae, V crunch for rectus abdominis, and single bridge for abdominal oblique externus are the greatest workouts ([41]Lam FMH, Liao LR, Kwok TCY, Pang MYC,2016).

In Nigeria, Low back pain problemsamong law enforcement corpshas been the most prevalent musculoskeletal condition and major occurrence of injury in pelvic dysfunctionality of spinal muscles, nerves, bones, discs or tendons, mostly during the daily duties of Nigeria Army (NA), Nigeria Police Force (NPF), Nigeria Security & Civil Defense Corps (NSCDC) (Ying, Bach, & Orhede,2017). Also the law enforcement corps was mostly affected by Low back pain problems due to prolonged standing classified as a task component prevalent standing for long hours, carrying and walking with heavy arms were reasons for the negative consequence of low back pain (Ying, Bach, &Orhede, 2017). In Ibadan, Oyo state the effects of low back pain remains among law enforcement corps, studies have reported the efficiency of exercise especially stretching exercises but not much information is available regarding whole body vibration on ameliorating the effect of low back pain.

Statement of the Problem

A survey among Physical Fitness components of Securities in the University of Ibadan, lack knowledge of exercise especially stretching exercises and poor preventive behavior toward whole body vibration. Finding a way to motivate and educate law enforcement corps on Clinical practice guidelines is recommended for the prevention and management of Low Back Pain (LBP) (Foster NE,et.al, 2018). These practice guidelines include education that supports stretching exercises, whole body vibration and self-management of normal activities and exercise, use of medication, imaging, and surgery. To fill the gaps there is need to ascertain the applicability of effects of eight (8) weeks whole body vibration and stretching exercise on low back pain of law enforcement corps to reduce the negative effects of low back pain. Therefore, the study is aimed at investigating the effects of an 8-week whole body vibration on low back pain of law enforcement Corps among law enforcement corps and compare the interaction effect of treatment, gender and age on low back pain of law enforcement Corp Ibadan, in Oyo state, Nigeria.

Hypotheses

The following null hypotheses are formulated and tested in the study:

Ho1: There will be no significant effect of an 8-week whole body vibration on low back pain of law enforcement Corps in Ibadan, Oyo State.
Ho2: There will be no significant effect of an 8-week stretching exercise on low back pain of law enforcement Corps in Ibadan, Oyo State.
Ho3: There will be no significant main effect of gender on low back pain of law enforcement Corp in Oyo state.
Ho4: There will be no significant main effect of age group on low back pain of law enforcement Corp in Oyo state.
Ho5: There will be no significant interaction of treatment, gender and age on low back pain of law enforcement Corp in Oyo state.

Methodology

The randomized pre-test post-test control group experimental research design of 3x2x2 factorial matrixes was adopted for this study. Purposive sampling technique was used to select 90 participants of equal (45) males and (45) females with low back pain within the age range of 30 to 50 years was then randomized into experiments group 1 (30), experimental group 2 (30) and into control groups of (30). Data was collected by dividing the groups into Experimental group I & II and a control group.

(i) Treatment Group: There were pre-test measures of the selected independent variables:

(a) Experimental Group I (Whole body vibration),

(b) Experimental Group II (Stretching exercise)

(ii) Control Group: There was pre-test of the selected Nigeria Army (NA), Nigeria Police Force (NPF) and Nigeria Security & Civil Defense (NSCDC) dependent variables on Fitness talk (concept of exercise) on the participants in the control group before they were placed on low back pain at non-consecutive days per week.

Training programme was adhered to training principles of progression in the exercises, intensity, frequency and duration. Training programmes was drawn from various literatures with slight modification. Training was in progression and conducted three times a week with a day rest in between the sessions. The training programmes for the participants was varied on daily basis (1st day, 2nd day and 3rd day) of the 8 weeks training duration. All sessions were preceded by a 10 minute dynamic warm-up which was include brisk walking, leg swing (forward/back and left/right), shoulder bridge and arm rotation.

This was followed by the training exercises session which were lasted for thirty (30) minutes. The training sessions on each day was concluded with cool down exercises five (5) minutes. Hence, the total duration of training on each day was forty five (45) minutes. The test location was at the Law Enforcement premises at Eleyele Police Headquarters Ibadan, Nigeria Army Headquarters, Odogbo Ibadan, Oyo State, Nigerian Security & Civil Defence Corps (NSCDC) Headquarters at Secretariat

Ibadan, Oyo State. **T**he use of whole body vibration and stretching exercise on low back pain among law enforcement corps. Whole body vibration, stretching exercise and low back pain were variables of interest. Descriptive statistics of frequency count, percentages, was used to analyze the demographic data of the participants; mean and standard deviation was used to determine the anthropometric compositions of the participants, while the hypotheses was tested using T-test and Analysis of Co-variance (ANCOVA) at 0.05 level of significance.

Results

This chapter presents and discusses the result of data collected on the field as well as the analysis of results and discussion of findings based on the research questions answered and the hypothesis tested.

Demographic Data Presentation.

The analysis of socio-demographic characteristics of participants is presented as follows:

Table 1 Division of enforcement corps

Division of enforcement corps	Frequency	Percent
Nigeria Army Force	30	33.3
Nigeria Police Force	30	33.3
Nigerian Security & Civil Defence Corps (NSCDC)	30	33.3
Total	90	100.0

Source: Fieldwork, 2022 Researcher

Table 1 reviews that the Division of enforcement corps distribution of respondents on the table above shows that out of the total respondents of 90, 30(33.3%) were from Nigeria Army (NA), Nigeria Police Force (NPF) and Nigeria Security & Civil Defense (NSCDC) respectively .

Table 2 Gender of the Respondents

Gender	Frequency	Percent
Male	45	50.0
Female	45	50.0
Total	90	100.0

Source: Fieldwork, 2022 Researcher

Table 2 above reveals that equal numbers participants 45(50.0%) were males and females respectively.

Hypotheses

The following hypothesis were tested at 0.05 level of significance

Ho1: There will be nosignificant main effect of treatment(Whole body vibration, stretching exercise and control) **on low back pain of law enforcement Corps in Ibadan, Oyo State.**

Table 3 Summary of Analysis of Covariance of Main Effect of Treatments on low back pain of law enforcement Corps

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	7748.998	3	2582.999	202.190	.000	.876
Intercept	403.281	1	403.281	31.568	.000	.269
Pretest	99.909	1	99.909	7.821	.006	.083
Treatments	1901.066	2	950.533	74.405	.000	.634
Error	1098.658	86	12.775			
Total	57801.000	90				
Corrected Total	8847.656	89				

a. R Squared = .876 (Adjusted R Squared = .871)

Table 3 shows that there was a**significant main effect of treatment of**(Whole body vibration, stretching exercise and control) **on low back pain** ($F_{(4,87)}$= 74.405, p<0.05, η^2=0.634) **of law enforcement Corps in Ibadan, Oyo State.** The null hypothesis was therefore, this implied that the combined treatment (Whole body vibration, stretching exercise and control) was effective in reducing the **low back pain of law enforcement Corps in Ibadan, Oyo State** in the study. The eta square value of 0.634 shows the treatment effect size of 63.4%**.**

Table 4: Estimated Marginal Means of Treatments on low back pain of Participants

			95% Confidence Interval	
Treatment	Mean	Std. Error	Lower Bound	Upper Bound
Exp Group I(Stretching Exercise training(SET)	32.748[a]	.872	31.014	34.482
Exp Group II(Whole Body Vibration(WBV)	22.816[a]	.741	21.342	24.290
Control Group (Fitness Talk)	14.403[a]	1.137	12.143	16.662

a. Covariates appearing in the model are evaluated at the following values: Pre_Test = 17.82.

Table 4 reveals that after controlling for initial difference on **low back pain**, the participants exposed to Stretching Exercise training (SET) had the highest mean score (mean=32.748), followed by those in the Whole Body Vibration(WBV) (mean= 22.816), while the control group had a mean score of 14.403. This implies that Stretching Exercise training (SET) with the highest mean score may be more effective in reducing **low back pain of law enforcement Corps in Ibadan, Oyo State.**

Ho^2: There will be no significant main effect of whole body vibration on low back pain of law enforcement Corps in Ibadan, Oyo State.

Table 5: Summary of Analysis of Covariance of Main Effect of whole body vibration on low back pain of law enforcement Corps

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	7388.664[a]	3	2462.888	145.174	.000	.835
Intercept	118.917	1	118.917	7.010	.010	.075
Pretest	2145.551	1	2145.551	126.469	.000	.595
WBV	1540.732	2	770.366	45.409	.000	.514
Error	1458.992	86	16.965			
Total	57801.000	90				
Corrected Total	8847.656	89				

a. R Squared = .835 (Adjusted R Squared = .829)

Table 5 shows that there was a significant main effect of whole body vibration on l ow back pain ($F_{(2,86)}$= 45.409, p<0.05, $?^2$=0.514) of law enforcement Corps in Ibadan, Oyo State. The null hypothesis was therefore rejected. This implied that there a significant main effect of whole body vibration on low back pain has effective in reducing the on low back pain of law enforcemen t Corps in the study. The eta square value of 0.514 shows the contributing effect size of treatment was 51.4%.

Table 6: Estimated Marginal Means of pretest- posttest of Whole Body Vibration on Low Back Pain of Participants

Whole Body Vibration	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Low	19.748[a]	.599	18.557	20.939
Moderate	26.021[a]	.960	24.113	27.929
High	32.011[a]	1.097	29.831	34.191

a. Covariates appearing in the model are evaluated at the following values: Pre_Test = 17.82.

Table 6 shows that the whole body vibration had the high posttest mean score (mean=32.011), followed by moderate (mean=26.021), while low had the least post mean score of 19.748. This implies that whole body vibration had the high post mean score in reducing low back pain of law enforcement Corps .

Ho[3]: There will be no significant main effect of stretching exercise on low back pain of law enforcement Corps in Ibadan, Oyo State.

Table 7: Summary of Analysis Covariance of **main effect of Stretching Exercise on Low Back Pain of Participants**

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	6247.151[a]	3	2082.384	68.865	.000	.706
Intercept	48.464	1	48.464	1.603	.209	.018
Pretest	683.935	1	683.935	22.618	.000	.208
SE	399.219	2	199.609	6.601	.002	.133
Error	2600.505	86	30.238			
Total	57801.000	90				
Corrected Total	8847.656	89				

a. R Squared = .706 (Adjusted R Squared = .696)

Table 7 shows that that there was significant main effect of stretching exercise on low ba ck pain ($F_{(2,86)} = 6.601$, $p>0.05$, $\eta^2 = 0.133$) of law enforcement Corps in Ibadan, Oyo State. The null hypothesis was therefore considered rejected. This implied that there was significant main effect of stretching exercise on low back pain of law enforceme nt Corps in the study area. The eta square value of 0.133 shows the treatment effect size of 13.3%.

Table 8: Estimated Marginal Means of pre-post test of Stretching Exercise on Low Back Pain of Participants

			95% Confidence Interval	
Stretching Exercise	Mean	Std. Error	Lower Bound	Upper Bound
Low	18.021[a]	1.697	14.648	21.394
Moderate	26.786[a]	1.240	24.321	29.251
High	25.041[a]	1.107	22.840	27.241

a. Covariates appearing in the model are evaluated at the following values: Pre_Test = 17.82.

Table 8 shows th at the **stretching exercise** had the moderate post mean score (mean=26.786), followed by high (mean=25.041), while low had the least post mean score of 18.021. This

Table 9: Summary of Analysis Covariance of main effect of treatment and gender on low back pain of law enforcement Corp

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	7749.714[a]	6	1291.619	97.641	.000	.876
Intercept	399.451	1	399.451	30.197	.000	.267
Pre	100.459	1	100.459	7.594	.007	.084
Treat	1894.723	2	947.361	71.617	.000	.633
Gender	.428	1	.428	.032	.858	.000
Treat * Gender	.290	2	.145	.011	.989	.000
Error	1097.941	83	13.228			
Total	57801.000	90				
Corrected Total	8847.656	89				

a. R Squared = .876 (Adjusted R Squared = .867)

Table 9 shows that that there was no **significant main effect of treatment and gender on low back pain** ($F_{(2,83)} = 0.011$, $p<0.05$, $\eta^2 = 0.00$) **of law enforcement Corps in Ibadan, Oyo State.** The null hypothesis was therefore considered tenable. This implied that t **here was no significant i nteraction of treatment and gender on low back pain of law enforcement Corps in** the study area. The eta square value of 0.00 shows the treatment effect size of 0.00%.

Table 10: Estimated Marginal Means of low back pain by Gender

			95% Confidence Interval	
Gender	Mean	Std. Error	Lower Bound	Upper Bound
Male	23.253[a]	.543	22.174	24.332
Female	23.391[a]	.543	22.312	24.470

a. Covariates appearing in the model are evaluated at the following values: Pre_Test = 17.82.

Table 10 shows that female participants had a slighthigher posttest mean score (23.391) than their male (23.253) counterpart. This implied that the female gender may have a slight high reduction in low back pain than the male.

Figure 10 shows that female participants had marginal different posttest mean score (23.39) than their male (23.25) counterpart. This implied that the female gender had similar reduction in low back pain as the males.

Ho[5]: There will be no significant interaction of treatment, gender and age on low back pain of law enforcement Corp in Oyo state.

Table 11: Summary of Analysis Covariance of main effect of treatment gender and age on low back pain of law enforcement Corp

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	7749.714[a]	6	1291.619	97.641	.000	.876
Intercept	399.451	1	399.451	30.197	.000	.267
Treat	1894.723	2	947.361	71.617	.000	.633
Pre	100.459	1	100.459	7.594	.007	.084
Treat * Gender * age	152.109	6	50.564	6.723	.001	.170
Error	1097.941	83	13.228			
Total	57801.000	90				
Corrected Total	8847.656	89				

a. R Squared = .876 (Adjusted R Squared = .867)

Table 11 shows that that there was a significant interaction of treatment, gender and age on low back pain ($F_{(6,84)}$ = 6.723, $p<0.05$, η^2 = 0.170) of law enforcement Corps in Ibadan, Oyo State. The null hypothesis was therefore rejected. This implied that there is a significant effect of treatment, gender and age on low back pain of law enforcement Corp in Oyo state. The eta square value of .170 shows the treatment effect size of 17.00%.

Discussion of Findings

The study revealed that there was significant main effect of treatment of Whole body vibration, stretching exercise and control on low back pain. Thisfinding is in-line with the studies which showed that Whole body Vibration (WBV) comprises the transfer of relatively low frequency environmental vibration to the human body through a broad contact area.This response is produced by muscle and tendon oscillation, which causes modest and rapid changes in muscle-tendon unit length. These alterations are subsequently sensed by muscle spindles, which attempt to minimize muscular stretching by reflex muscle contraction, resulting in pain reduction (Lora MH, Corrales BS, Páez LC,2017). It has also been demonstrated that high frequency and low amplitude vibration enhances gravity force through acceleration changes, hence enhancing bone morphology and encouraging muscular toning. This vibration mode can be employed by groups with low tonus and movement, such as the elderly (FMLam, PFChan, LRLiao, JWoo, EHui, CWLai, TCKwok& M.YPang,2018).

Furthermore, as an intervention strategy, whole body vibration (WBV) training can treat persistent low back pain (CLBP). WBV settings have varying impacts on lumbar-abdominal muscle performance, which is the source of low back pain (FMH, Liao LR, Kwok TCY & Pang MYC,2016). According to a comprehensive study, low back prevention and treatment programmes with an exercise component are the most likely to be beneficial (Michaleff,et.al, 2018). There is no evidence to suggest that one sort of exercise is better than another. Guidelines should, however, take into account individual preferences, needs, and capabilities when deciding on the type of exercise to be used (Foster NE,et.al, 2018). According to the results of hypothesis two, there was a significant main effect of exercise on low back pain. This conclusion supports the earlier discovery that exercise improves back extension strength, mobility, endurance, and functional impairment(Manniche, Lundberg & Christensen,2019). To alleviate chronic LBP, many activities have been advocated, including lumbar stabilization exercise (SE), motor control exercise, core exercise, lumbar flexion exercise, walking exercise, and bracing exercise. These exercises are designed to improve lumbar stability and core strength. However, no single exercise has been proved to be better to others (Geneen , Moore, & Clarke,2017).

Hypothesis three demonstrated that stretching exercise has a significant primary effect on low back pain. Lumbar SE is primarily intended to improve neuromuscular control, strength, and endurance of the muscles, all of which are thought to be critical to maintaining dynamic spinal and trunk stability. It is regarded as a safe workout with the benefits of numerous stages as well as cost-effectiveness (Lee, Kim, & Oh, Y, 2016). Because everyone has distinct lumbar muscle strengths, lumbar SE programmes

should be tailored to each individual, incorporating a variety of postures with differing intensities to maximize therapeutic benefit (Kim, Park, & Lee, 2016). There was no significant main influence of treatment and gender on low back pain treatment outcome. This data supports previous findings that low back pain (LBP) is the most common health condition causing pain and disability in older persons (Bressler HB, Keyes WJ, Rochon PA, Badley,2019). Earlier study reveals that LBP prevalence progressively increases from teenage to 45 years of age and subsequently falls, which may be ascribed to occupational exposure among working-age people, or age-related changes in pain perception or stoicism (Bernabei , Gambassi, Lapane, Landi, Gatsonis , Dunlop , et al. 2018).

Hypothesis five demonstrates it in terms of interaction. The results reveal that treatment, gender, and age all have a significant main influence on low back pain. The findings supported the hypothesis that the ageing process causes muscle, joint, and bone degeneration, diminishing muscle mass and strength by up to 40% after the 40th life year (Nilwik , Snijders , Leenders, Groen ,van Kranenburg , Verdijk , et al.,2017). Although resistance exercise is the preferred treatment for reducing sarcopenia and increasing strength, it is regarded as a very harsh training for the elderly due to its large range of motion and the danger of fractures and strains (Keller & Engelhardt, 2019).

Conclusion

Based on the findings of this research work, it was concluded that results showed that the effect of stretching exercise had the highest mean score while the whole body vibration **and** fitness talk on low back pain respectively. This implies that participants exposed to stretching exercise performed better than those exposed to whole body vibration and fitness talk on low back pain. It is therefore concluded that there was a significant effect of an 8-week whole body vibration on low back pain of law enforcement Corps in Ibadan, Oyo State, In conclusion low back pain treatment, stretching exercise, and sling are prevalent. Stretching exercise relieves muscle tension, leads to improve blood circulation. Increase the movement in the trunk and legs by stretching improves muscle strength, alleviate low back pain, and help recovery of normal movements.

Recommendation

Based on the findings of this study the following recommendations were made:

i. Level of low back pain is severe so law enforcement officers should be given proper education regarding low Back Pain and provided with opportunity for regular exercises to strengthen body muscles.
ii. The researcher also recommends that Federal, state government and stakeholder should support, provide and funds law enforcement corps due to the nature of their work regular provision of kits, and training and re-training on stretching exercises and whole body vibration on ameliorating the effect of low back pain.

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