

Ergonomic Intervention for Preventing Musculoskeletal Disorder

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Abstract – Notwithstanding the increasing frequency of musculoskeletal injuries among casual sector workers because of openness to workplace hazard factors, there is a lack of writing inspecting the adequacy of interventions to forestall musculoskeletal disorders. The point of this examination was to research the adequacy of interventions to forestall musculoskeletal medical conditions as well as diminish hazard factors among casual sector workers. A deliberate audit of the writing was directed utilizing an examination agenda created by the Joanna Briggs Institute. The heterogeneity of the investigations blocked a meta-examination, so an account blend strategy was utilized. Intervention contemplates met the incorporation rules. These interventions gave high and moderate proof to help the utilization of these techniques for counteraction of musculoskeletal injuries or workplace hazard. The impacts, regardless of whether positive, negative or none was affected by test size, inspecting strategy, examination gathering and time analyzed. Horticulture is most prevailing sector in India. India positions second worldwide in horticulture. In most formative nations, horticulture is perceived as perhaps the most dangerous ventures. Ranchers and homestead workers face the absolute most noteworthy risks of work-related musculoskeletal injury and sickness in the country. Because of some musculoskeletal disorders, a few investigations showed that some constant handicap. Point of the re-visitiation of work, improvement in work status (for workers performing changed obligations) as well as the accomplishment of a more elevated level of capacity. In this examination, ergonomic advices were given to counteraction of musculoskeletal disorder and physiotherapy intervention like manual treatment, extending exercise, reinforcing exercise and so forth. The reason for this examination was to look at viability of ergonomic advice and physiotherapy intervention in management musculoskeletal disorders, (MSD) in rancher and workers.

Keywords – Musculoskeletal Disorder, Ergonomic Intervention, Treatment.

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INTRODUCTION

Farmers are about a large portion of the world's whole workforce, with a gauge of 1.3 billion workers (ILO, 2003). In most formative nations, horticulture is perceived as quite possibly the most perilous enterprises. There is a large group of injuries and diseases in horticulture that have been reliably distinguished through epidemiological and local area based examinations as deprived for controlling because of their high detailing rates among agrarian workers. These incorporate musculoskeletal disorders, respiratory sickness; commotion instigated hearing misfortune, mental, pesticide-related diseases, and expanded revealing of malignancy cases. Notwithstanding, it has been reliably shown that musculoskeletal disorders (MSDs) are the most well-known of all word related non-lethal injuries and ailments for ranch workers, particularly the individuals who are associated with work escalated rehearses.

Horticultural workers associated with work serious practices are presented to a huge number of

musculoskeletal disorders hazard factors. The writing has shown three fundamental danger factors that are of most extreme need in horticulture (Meyers et al., 2000, 1997, 2001). These include: lifting and conveying weighty burdens (more than 50 lb); supported or rehashed full body twisting (stoop); and profoundly dull hand work (cutting, Cutting) during cultivating, creature mindful. Some house hold exercises are more normal in musculoskeletal disorder.

Because of some musculoskeletal disorders a few examinations showed that some persistent incapacity missing in work and experiencing some psychosomatic disorders. Henceforth now a the very beginning of the main consideration for rancher self-destruction in India's every single state Farmer self-destruction in India is the deliberate completion of one's life by an individual ward on cultivating as their essential wellspring of job. In 2012, the National Crime Records Bureau of India announced 13,754 rancher suicides. The rancher self-destruction rate in India has gone between 1.4 to 1.8 per 100,000

absolute populaces, over a 10-year time span through 2005. India is an agrarian country with around 60% of its kin depending straightforwardly or in a roundabout way upon horticulture. Rancher suicides represent 11.2% of all suicides in India. Activists and researchers have offered various clashing purposes behind rancher suicides, like rainstorm disappointment, high obligation troubles, hereditarily altered harvests, government arrangements, public emotional well-being, injury, wellbeing related disorder, private matters and family issue. Rancher related wellbeing cause self-destruction like constant disease, musculoskeletal disorder, handicap and so forth, and 9.73 % in India.

MSD's are additionally alluded to as overexertion/abuse injuries, total injury disorders, dull strain injuries, and injuries and strains. Nonetheless, working in a stooped stance during execution of various farming exercises brings about a rating of uneasiness and exhaustion.

RISK FACTOR FOR MUSCULOSKELETAL DISORDERS IN FARMER AND WORKERS

Low back disorders

The relationship of physical workload with low back disorders by depended on companion and case-control examines. Rancher has a lot of sum work like lifting, bowing, turning and so forth the surveys show that the proof is solid for manual materials dealing with, bowing and turning stances at work, and entire body vibration as being hazard factors for LBP. Regarding patient taking care of, the proof is moderate. Consequently base o surveys past examination showed that due to back torment debilitated leave and missing in workers, and farmers.

Neck and upper limb disorders

The Bone and Joint Decade Task Force has as of late summed up the determinants of neck torment among the working (Côté et al. 2008) and the all-inclusive communities (Hogg-Johnson et al. 2008). The two audits inspected the writing from 1980 to 2006. These surveys are the first wherein an adequate number of accomplice examines were accessible to permit solid ends to be drawn. The best proof blend among the working populace depended on 19 accomplice studies and 1 RCT. The accompanying take an enormous risk torment were recognized: drawn out sitting, monotonous and accuracy work, delayed neck flexion, elbow and shoulder pose while working, for example, overhead action. Fundamental proof was tracked down that off-kilter work stances, monotonous work, and openness to glare may be related with neck torment.

Ergonomics

Ergonomics (or human components) is the logical discipline worried about the comprehension of communications among people and different components of a framework, and the calling that applies hypothesis, standards, information and strategies to plan to improve human prosperity and generally framework execution. Physical ergonomics is worried about human life structures, and a portion of the anthropometric, physiological and bio mechanical attributes as they identify with physical action. Physical ergonomic standards have been broadly utilized in the plan of both customer and mechanical items. Physical ergonomics is significant in the clinical field, especially to those determined to have physiological infirmities or disorders like joint inflammation (both ongoing and brief) or carpal passage condition. Pressing factor that is unimportant or vague to those unaffected by these disorders might be exceptionally excruciating, or render a gadget unusable, for the individuals who are. Numerous ergonomically planned items are likewise utilized or prescribed to treat or forestall such disorders, and to treat pressure-related persistent agony.

Low back pain: The back school or ergonomic advice is generally helpful or avoidance for additional incapacity and missing aggregate for their work or useful exercises. The utilization of dark belts, lumbar backings (Jellema et al. 2001; Linton and van Tulder 2001; van Poppel et al. 2004; Ammendolia et al. 2005; Bigos et al. 2009), and shoe additions or latrines have additionally been demonstrated to be in successful (Burton et al. 2006, Bigos et al. 2009). Preparing in manual materials taking care of or the utilization of lifting supplies isn't successful in case it is utilized as the solitary intervention (Bos et al. 2006; Martimo et al. 2008; Bigos et al. 2009). Preparing and schooling joined with the utilization of mechanical or different guides might be powerful, which can be incompletely clarified by an abatement in the recurrence of manual lifting (Bos et al. 2006).

Physiotherapy Intervention

Early intervention with physiotherapy can lessen the measure of time individuals are off wiped out and is fundamental to forestall an intense issue becoming persistent. Self-reference to physiotherapy has been demonstrated to be clinically fruitful with high quiet fulfillment just as practical. Constant musculoskeletal torment is on-going agony during the bones and joints of the body, for instance toward the back or knees. It very well might be the aftereffect of a musculoskeletal infection or injury or the reason may not be known.

Exercise can be any movement that upgrades or keeps up with muscle strength, physical wellness and generally wellbeing. Individuals exercise for some, various reasons including weight reduction and reinforcing muscles, and working on their

energy. Once in a while it tends to be hard to proceed with the exercise program that your primary care physician, attendant or physiotherapist suggests. One method of assisting individuals with adhering to exercise is called 'evaluated exercise action'. This implies the exercise is focused on to more vulnerable muscles or agonizing regions and gets increasingly seriously testing. Alternate ways included managing exercise meetings, giving 'boost' meetings to go over the exercise program once more, and giving sound or tapes of the exercises to bring home.

REVIEW OF LITERATURE

Hassan Sadeghi Naeini, Karmegam Karuppiah, Shamsul Bahri Tamrin and Koustuv Dalal (2014) had concentrate on Ergonomics in agribusiness: An Approach in Prevention of Work-related Musculoskeletal Disorders (WMSDs) they presume that Ergonomists had the option to create and present some possible answers for farming undertakings, which are moderate as far as financial ideas, particularly for lower-pay social orders. Furthermore, the execution of money saving advantage ergonomic arrangements should be possible by related administrative bodies, enormous scope rural firms, and managers.

Clinical framework for the conveyance of physiotherapy administrations to harmed workers they said that in article, while torment might in any case be the worker's predominant manifestation, it may not be proper to proceed with treatment choices pointed exclusively at nearby relief from discomfort (for example electrotherapy or manual strategies). Physiotherapists need to think about the entirety of the contributing components when settling on management decisions and their adequacy for ongoing torment. The Clinical framework for the conveyance of physiotherapy administrations to harmed workers, while adjusted to this general record, furnishes physiotherapists with more explicit and thorough direction on seven framework standards to help and guarantee the conveyance of result centered physiotherapy management.

Rekha Vyas, (2012) article named "Alleviation of musculoskeletal issues and body uneasiness of rural workers through instructive intervention", led an examination about WMSDs among 120 Indian farmers (60 guys and 60 females) and furthermore fostered an instructive intervention to further develop conditions for workers as far as security. A body map and Visual Analog Discomfort 11-point scale (VAD) were utilized for information gathering. The outcomes showed that the entirety of the respondents had some level of MSDs, particularly in the neck, shoulder, upper arm, and fingers. The general inconvenience rating (ODR) additionally showed that the workers revealed a higher uneasiness rate during exercises, for example, land planning, planting, water system, weeding, gathering and sifting. Notwithstanding, the general inconvenience rating among the females was more

than male workers. This examination showed that instructive intervention worked on the workers' information about WMSDs.

Bhattacharyya and Chakraborty (2012), in their paper named "Ergonomic bin configuration to lessen combined injury disorders in tea leaf culling activity", showed that tea leaf culling activity is the fundamental assignment in tea manor including some WMSDs hazard factors. Their examination was done in India among 180 female workers who worked on tea ranches. As culling needs some extreme body exertion, ergonomics interventions will make more secure conditions. In this investigation, a few strategies and polls, for example, the techniques for Occupational Repetitive Assessment (OCRA), Quick Exposure Check (QEC), and Heart rate observing, NMJ and Rating of Perceived Exertion (RPE), were OCRA results that affirmed the presence of the danger of WMSDs. In this investigation, and thinking about the accumulated information, another bushel was planned. Two containers conventional and new plan were thought about during use as far as certain physiological markers, for example, pulse, energy consumption, and rating of apparent effort. These markers showed the viability of the new container plan as far as work physiology and ergonomics.

Lucia Bertozzi et al 2012 considered that Effect of Therapeutic Exercise on Pain and Disability in the Management of Chronic Nonspecific Neck Pain: Systematic Review and Meta-Analysis of Randomized Trials they inferred that Consistent with different surveys, the outcomes support the utilization of Therapeutic Exercise in the management of Chronic Nonspecific Neck Pain. Specifically, a huge in general impact size was discovered supporting Therapeutic Exercise for its impact on torment in both the short and moderate terms.

Pragya Ojha et al 2012 contemplated An Ergonomic Study on Human Drudgery and Musculoskeletal Disorders by Rice Transplanting This examination has featured the likely relationship between postural inconveniences and rice relocating action. Subsequently, it tends to be inferred that manual evacuating and relocating is all the more physically requesting movement when contrasted with mechanical removing and relocating action. A large portion of the occasion's workers received standing, bowing and sitting stance for performing manual and mechanical rice relocating. They were not taking legitimate rests in the middle and during the exercises. Respondents associated with manual strategy were experiencing undeniable degree of MSDs in back, neck, shoulders, legs and thighs though extremely low degree of MSDs was found in ranch workers playing out the movement utilizing mechanical removing and relocating. Accordingly it tends to be presumed that through automation, the degree of MSDs can be decreased or limited.

The impact of the intervention in 3 examinations was determined by utilizing univariate measurable tests (Choobineh et al, 2004 a, b; Veiersted et al, 2008), while 1 investigation utilized univariate measurements to depict member discernments (Pun et al, 2004). Two examinations fostered a multivariate model dependent on blended and strategic relapse models (Haukka et al, 2008; Jensen and Friche, 2008). Two examinations utilized a blend of univariate and multivariate models to survey between bunch contrasts (Carrivick et al, 2002; Heinrich et al, 2009).

Veiersted et al (2008) dissected two interventions, composed data just versus that data and individual follow-up seeing the procedure as they identified with grumblings of the neck and shoulders. Results from a combined t-test uncovered a critical diminishing in the length of times beauticians raised their arms above 90o from 4.0% to 2.5%, however no present moment (1-2 months) impact was seen on neck and shoulders side effects.

Jensen and Friche (2008) analyzed the impacts of preparing among floor layers to lessen knee strain contrasted and a benchmark group. The danger of having knee grievances for over 30 days (changed OR 2.46; 95% CI 1.03-5.83) or locking of the knees (OR 2.89; 95% CI 1.11-7.5) was more than twofold among subjects who utilized the new technique for short of what one year contrasted with the individuals who utilized the strategy more noteworthy than one year. Nonetheless, there were no distinctions among workers who previously had serious knee torment preceding the intervention (OR 0.85; 95% CI 0.38-1.92).

Carrivick et al (2002) directed an accomplice study to assess the viability of a participatory workplace hazard appraisal group in lessening the rate and seriousness of musculoskeletal and non-musculoskeletal injuries 3 years post-intervention. There was a relationship between the participatory ergonomics intervention and a decrease in both danger and seriousness of musculoskeletal injuries; however the noticed changes in non-musculoskeletal seriousness were not critical. The participatory methodology decreased musculoskeletal injury term and guarantee cost rates by 40% and 65%, separately.

OBJECTIVE OF THE STUDY

1. To distinguish the viability of physiotherapy intervention in management musculoskeletal disorders, (MSD) in rancher and workers.
2. To decide the pervasiveness of musculoskeletal disorders, (MSD), in rancher and workers.

RESEARCH METHODOLOGY

At premise of standard Nordic poll, Body part inconvenience scale and General Assessment design divided Sub gatherings concurring Musculoskeletal Disorder Like Low back torment, neck torment, shoulder torment, elbow torment, Hand and wrist agony, Hip and crotch torment, knee torment, lower leg and foot torment, and upper back torment. In Subgroups, some Musculoskeletal Disorders are thought of

Low back Pain group:

Methods:

Group A (30 Farmers) Ergonomic interventions, Group B (30 farmers) Ergonomic heartbeat physiotherapy interventions. Subjects were clarified about the Research and treatment convention. Advise assent structure was endorsed by the subject before the treatment start. Subjects were screened utilizing an Assessment Form and Outcome measure benchmark, 3month.

Both group received ergonomic interventions:

- The break might comprise of incessant brief breaks, like 5 minutes after consistently.
- The workers might convey saplings/crops on their back rather than head and investigate the chance of proper rucksack.
- Alternate low-reiteration assignments with errands that require dreary movement, for example, in picking or weeding, for sufficient recuperation from the redundant movement task.
- Strain on the lower back and legs are diminished by plunking down while working. Standing makes legs swell (more than strolling does). The best positions are ones that permit workers to do various sorts of work, changing from sitting, to remaining, to strolling and back once more.

Group B: Physiotherapy interventions.

Each subject got physiotherapy medicines double seven days for 90 days. Manual treatment included indication management as per the watchfulness of the treating physiotherapist, who browsed spinal activation/control, delicate tissue knead, however not electro physical modalities.

Neck Pain group:

Methods:

Group A (30 Farmers) Ergonomic interventions, Group B (30 farmers) Ergonomic heartbeat physiotherapy interventions. Subjects were clarified about the Research and treatment convention. Advise assent structure was endorsed by the subject before the treatment start. Subjects were screened utilizing an Assessment Form and Outcome measure standard, 3month.

Both group received ergonomic interventions:

- The break might comprise of regular brief breaks, like 5 minutes after consistently.
- The workers might convey saplings/crops on their back rather than head and investigate the chance of proper knapsack.
- Alternate low-reiteration errands with undertakings that require monotonous movement, for example, in picking or weeding, for sufficient recuperation from the dull movement task.
- The best positions are ones that permit workers to do various sorts of work, changing from sitting, to remaining, to strolling and back once more.

Group B: Physiotherapy interventions.

Each subject got physiotherapy treatments two times every week for 90 days. Manual treatment included manifestation management as indicated by the caution of the treating physiotherapist, who browsed spinal activation/control, delicate tissue knead, Neck Stretching, reinforcing, yet not electro physical modalities.

Shoulder pain group

Methods: Group A (30 Farmers) Ergonomic interventions, Group B (30 farmers) Ergonomic heartbeat physiotherapy interventions. Subjects were clarified about the Research and treatment convention. Illuminate assent structure was endorsed by the subject before the treatment start. Subjects were screened utilizing an Assessment Form and Outcome measure pattern, multi month.

Both group received ergonomic interventions

- The break might comprise of regular brief breaks, like 5 minutes after consistently.
- The workers might convey saplings/crops on their back rather than head and investigate the chance of suitable rucksack.

- Alternate low-redundancy undertakings with errands that require dull movement, for example, in picking or weeding, for satisfactory recuperation from the dreary movement task.
- The best positions are ones that permit workers to do various kinds of work, overhead movement.

Group B: Physiotherapy interventions.

Each subject got physiotherapy treatments two times per week for 90 days. Physiotherapy interventions incorporate manual physical treatment where latent joint activation was farmers to prepare and extend the delicate tissue. Managed and recommended exercises mean to further develop scope of development and muscle work by reestablishing shoulder portability and solidness, however not electro physical modalities.

Elbow pain group:

Methods: Group A (30 Farmers) Ergonomic interventions, Group B (30 farmers) Ergonomic heartbeat physiotherapy interventions. Subjects were clarified about the Research and treatment convention. Advise assent structure was endorsed by the subject before the treatment start. Subjects were screened utilizing an Assessment Form and Outcome measure benchmark, multi month.

Both group received ergonomic interventions:

- The break might comprise of incessant brief breaks, like 5 minutes after consistently.
- The workers might convey saplings/crops on their back rather than head and investigate the chance of proper rucksack.
- Alternate low-reiteration assignments with errands that require tedious movement, for example, in picking or weeding, for satisfactory recuperation from the monotonous movement task.
- The best positions are ones that permit workers to do various kinds of work, overhead movement.

Group B: Physiotherapy interventions.

Each subject got physiotherapy treatments two times every week for 90 days. Physiotherapy interventions incorporate manual physical treatment where inactive joint activation was farmers to prepare and extend the delicate tissue. Managed and recommended exercises mean to further develop scope of development, agony, strength and useful movement, however not electro physical modalities. Patients were additionally shown a graduated

exercise treatment routine including extending exercises and reformist opposed exercises.

1. **Stretching:** Static extending to lower arm extensors ought to be applied for 30secs. Absolute 6 redundancies with rest of 30 seconds between every meeting were given.
2. **Strengthening exercise:** Perform wrist expansion gradually and keep up with the situation of augmentation for 2 seconds and bit by bit get back to beginning position. Dynamic movement of wrist expansion with elbow flexed 90, 2-3 arrangements of 10 reiterations were begun, advancing to 5 arrangements of 10 redundancies as endured. At the point when subject can perform 50 redundancies without overcompensation of different muscles 1 pound of weight is added and performed 3 arrangements of 10 reiteration progress to 5 sets. Then, at that point add 1 pound of weight and progress till 3 pound weight. As resistance further develops elbow is taken in to augmentation.

Hand and Wrist pain group:

Methods: Group A (30 Farmers) Ergonomic interventions, Group B (30 farmers) Ergonomic heartbeat physiotherapy interventions. Subjects were clarified about the Research and treatment convention. Advise assent structure was endorsed by the subject before the treatment start. Subjects were screened utilizing an Assessment Form and Outcome measure benchmark, multi month.

Both group received ergonomic interventions:

- The break might comprise of successive brief breaks, like 5 minutes after consistently.
- The workers might convey saplings/crops on their back rather than head and investigate the chance of suitable knapsack.
- Alternate low-redundancy assignments with undertakings that require tedious movement, for example, in picking or weeding, for satisfactory recuperation from the dull movement task.
- The best positions are ones that permit workers to do various sorts of work, overhead action.

Group B: Physiotherapy interventions.

Each subject got physiotherapy treatments two times every week for 90 days. Physiotherapy interventions incorporate manual physical treatment where inactive joint preparation was farmers to activate and extend the delicate tissue. Administered and recommended

exercises mean to further develop scope of development, agony, strength and utilitarian action, and wrist activation or carpal bone preparation delicate tissue assembly agreeing included region however not electro physical modalities. Patients were likewise shown a graduated exercise treatment routine including extending exercises and reformist opposed exercises.

Wrist flexion and extension

- Place your lower arm on a table, with your hand and influenced wrist reached out past the table, palm down.
- Bend your wrist to move your hand up and permit your hand to close into a clenched hand, then, at that point bring down your hand and permit your fingers to unwind. Stand firm on every foothold for around 6 seconds.

DATA ANALYSIS

Statistical Methods: Illustrative factual investigation has been completed in the current examination. Out Come estimations are estimated utilizing VAS scale and Elbow Function SD. Importance is evaluated at □Assessment (EFA) and introduced as mean 5% degree of importance $p < 0.005$ (2-followed speculation test considered).

Statistical tests:

Matched 't' test as a parametric and wilcoxon marked position test as a nonparametric test have been utilized for examination of VAS scale and Elbow Function Assessment (EFA) variables inside the Group An and Group B with computation of level of progress.

Free't' test as a parametric and Mann Whitney U test as a nonparametric test have been utilized the analyze the method for VAS scale and Function Assessment (EFA) factors between the groups with computation of level of contrast between the means.

Statistical software:

The Statistical programming to be specific SPSS 17.0 were utilized for the investigation of the information and Microsoft word and Excel have been utilized to produce charts, tables and so on

Results:

Group An Ergonomic interventions, Group B Ergonomic heartbeat physiotherapy interventions.

Table 1: Gender distribution of Subjects

Gender	Group A (Ergonomic interventions)		Group B (Ergonomic pulse physiotherapy interventions.)	
	No of Subjects	Percentage	No of Subjects	Percentage
Females	10	33%	9	30%
Males	20	67%	21	70%
Total	30	100%	30	100%

P<0.000**

The above table shows that there is Gender dissemination of subjects between two groups are not critical distinction. In Gender orientation dispersion in Group A.

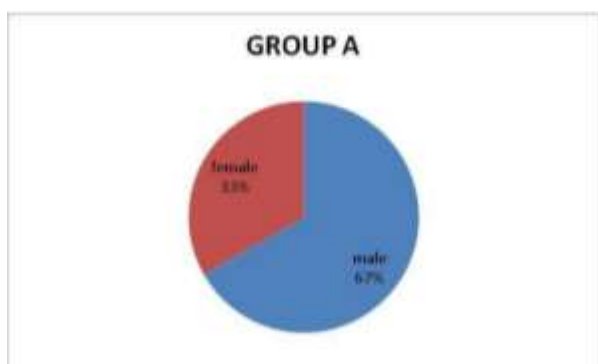


Figure 1: Gender distribution of Subjects In Group A

The above graph shows that there are 33% of Females and 67% of males in Group A.

CONCLUSION

In this investigation, found in the wake of giving physiotherapy in addition to ergonomics intervention farmers worked on practical action and forestalls further inability and injury. It likewise forestalls and diminishes hazard of injury. Likewise, decreased debilitated leave and further develop crop creation. With expansion in crop creation there is checked expansion in the economy of the country. This examination presumes that Physiotherapy in addition to ergonomic intervention gives more prominent improvement in torment, and utilitarian execution in all musculoskeletal disorder. (Shoulder, Elbow, Wrist and hand, Hip, Knee, foot and lower leg, Neck, Upper and lower back). The horticultural sector showed that the significant degree of manual taking care of hazard with the errand that necessary conveying hefty burdens with abnormal stances which are the likely causative elements of musculoskeletal disorders among farmers. The significance of this exploration is to research the word related wellbeing related issues and stances received by farmers during individual agrarian exercises and Prevention musculoskeletal disorder and early intervention. There is abundant proof of boundless openness of the individuals who work in horticulture to serious ergonomic danger factors consistently. As a rule, hazard factor openings can

surpass those found in a portion of the non-agrarian ventures presently ordinarily refered to as among the most risky for musculoskeletal disorders And counteraction Chronic Disability in rancher, and there is no any physiotherapy center and absence of therapy.

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