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ENP 61
Literature Review Assignment

The Sit-Stand Workstation

Humans are not designed to be perpetually sitting or standing. Our bodies tell us that through pain, discomfort, and other signs. But many professions require us to do stationary work. When solely sitting and solely standing are not satisfactory options for extended periods of time, a compromise must be made. That compromise is the sit-stand workstation in which the worker alternates between sitting and standing while doing work. Although this workstation has its disadvantages, they are outweighed by its advantages, demonstrating that the sit-stand workstation is a better alternative than both the exclusively sitting and exclusively standing workstations.

Sitting and standing workstations are not the most suitable options for working for long durations. Sedentary posture is associated with cardiovascular disease and musculoskeletal disorders (Callaghan, 2015). These health issues have led to a shift towards a standing workstation (Callaghan, 2015), because standing posture is supposedly better for the musculoskeletal system and has been shown to improve cognitive performance (Husemann, 2009). However, the standing workstation has its health disadvantages as well.

Prolonged standing can cause musculoskeletal disorders, cardiovascular disorders, and negative pregnancy-related health outcomes. The most common musculoskeletal complaint is lower back pain. Extended periods of standing reduce blood flow to the muscles, causing muscular fatigue and discomfort. This is especially pronounced in the lower back, but workers also complain of lower limb discomfort, sore feet, and stiffness in the neck and shoulders. This fatigue is measured through both subjective and biomechanical measures. Prolonged standing also leads to cardiovascular disorders, especially chronic venous insufficiency (CVI). When a person stands for an extended period of time without moving, blood pools in the veins of their legs. This pooling leads to varicose veins and causes their legs to swell. If not treated, this swelling will only increase, causing even greater discomfort. In addition to these disorders, prolonged standing can cause negative pregnancy-related health outcomes such as spontaneous abortions, preterm delivers, low birth weight, and stillbirths (Waters, 2015).

The solution, suggested by all three articles, is simple: a sit-stand workstation. This workstation allows the worker to complete a task while sitting or standing, so the worker is encouraged to periodically alternate between the two positions as needed. The goal of this workstation is to maintain the benefits of the two positions while eliminating the problems associated with being in each position for an extended time.

The advantages of the sit-stand workstation are increased comfort and health benefits. In the studies from each article, participants who used the sit-stand workstation either made fewer complaints or reported less discomfort than participants who used the sitting or standing workstations. This discomfort was measured subjectively in 2009 and through biomechanical measures in 2015. The latter study showed that even short standing breaks after an hour of sitting made a difference in reducing musculoskeletal discomfort (Callaghan, 2015). And, by reducing this discomfort, participants reduce their likelihood of developing the resulting musculoskeletal and cardiovascular disorders.

Nonetheless, there are still some concerns regarding the ratio of time spent sitting to standing and the efficiency of the sit-stand workstation. Since it is a relatively new paradigm, not enough research has been done to determine the optimal ratio of time spent sitting to time spent standing. While some researchers recommend a 1:1 ratio, they also point out that lower back pain starts to develop after 15 minutes of standing (Callaghan, 2015). If the user has to change positions every 15 minutes before discomfort begins, this time spent constantly changing positions could reduce efficiency (Husemann, 2009). Although I think this is a substantial concern, I believe that the sit-stand workstation is more efficient in the long term, because there will be less time lost changing positions than there would be if the user had to take time off to treat musculoskeletal and cardiovascular disorders caused from prolonged sitting or standing without changing positions. Although this problem could be fixed with workers who are easily replaceable, an even better solution is to improve the design of the workstation. This latter solution is why the sit-stand workstation evolved to include a work surface whose height could be adjusted quickly, efficiently, and safely (Callaghan, 2015).

In conclusion, since prolonged sitting and prolonged standing can cause musculoskeletal disorders, cardiovascular disorders, and other problems, and the sit-stand workstation reduces the risk of these health problems and improves comfort, the sit-stand workstation is the best alternative for the otherwise stationary worker. Furthermore, although productivity remains constant between the sitting or standing workstations and the sit-stand workstation, through more research and improvements the sit-stand workstation is likely to eventually optimize productivity. In fact, I imagine this sit-stand workstation paradigm will be implemented not only in offices but also in classrooms around the world.

References

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