Musculoskeletal Risk Related to Housework

Risco Osteomuscular Relacionado ao Trabalho Doméstico

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ABSTRACT

The Musculoskeletal Diseases related to work have been discussed for years in Brazil, but still are causes of health problems throughout life and the quotidian of many workers. In the case of those who work in the domestic sector, these houseworkers have no access to adequate security measures within their work environment and lack supervision and official control about this condition. In addition, the occupational diseases related to domestic work remain neglected. In order to identify risk factors for development of these diseases, were noticed the daily activities of a domestic worker for a full day in her workday. The most common risks were constituted by inadequate postures, repeatability of movements with spinal flexion, prolonged standing positions, bad organization of the activities and of the work environment and lack of adequate guidance to the worker on such problems. It was concluded for the need of creation and routine application of protocols and standardized guidelines to minimize the occurrence of musculoskeletal diseases related to the domestic work and to the risk of accidents, and to establish care practices and social policies that make possible to qualify the physical, mental and labor condition of those who live and occupy as domestic workers.

Keywords: Health Education, Curriculum, Health Professional Training.
As WMSDs are chronic conditions often manifested by subjective symptoms without identification of corresponding organ damage, many of the workers affected by them wander, without success, through the health services seeking improvement in their symptoms and returning to the same generation working conditions of their problem. Thus, these workers experience progressive clinic worsening, socioeconomic losses by reduced working capacity and relationship conflicts, becoming stigmatized. In this condition, they lose self-esteem, become insecure and feel frustrated and helpless. That is, they also start to suffer emotionally.

Still relating to WMSDs and their impact, there are several studies related to several specific occupational branches; however, there are very few studies in relation to domestic work. Moreover, it is likely that the epidemiological underreporting on the health of housemaids is significantly higher than what happens in relation to other categories, since most of those who work in the domestic sector operate informally.

On the other hand, the domestic work is still an activity predominantly performed by women. Be as professional that receives income of this branch; or as a worker who, although working in another branch, assumes most or almost all of the care tasks of your own home. These workers act mainly in an informal way, as already mentioned, they do not have social security or health protection in the workplace.

However, these professionals are at high risk for developing occupational health problems, especially diseases of the...
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Material and Methods

In addition, there is a higher frequency of mood disorders, difficulty in concentrating and psychosomatic manifestations in housemaids than in other occupational categories. Similarly, non-fatal accident in the workplace is 7.3% more frequent among housemaids. The most cited accidents are the accidents from falls, the twists of the lower limbs, cuts the skin and burns.

The housemaids commonly have problems related to work overload, lack of fixed time for the close of the workday and the lack of time to rest or eat properly. Certainly, this situation has historical reasons at the origin of domestic work as a slave activity, so that the home professional occupation seems to keep still some unique identity that affects the treatment that is given to worker of this area.

The main working tools of the workers that act in the domestic cleaning sector are their own bodies that wear out by the use as any other tool. In this sense, backaches or leg pain and swelling in the lower limbs are common complaints among housemaids.

Adding to what has been exposed, 22% of users of the Unified Health System (SUS) are housemaids. In this way, the concern for the occurrence of WMSDs in this category of workers is very relevant.

Given the biomedical and social importance of WMSDs among the housemaids and the current lack of attention on this issue, we decided to observe the labor activity of a housemaid during a full workday, in order to describe risk factors for developing WMSDs in this type of occupation and propose triggers for a reflection on the subject.

Results

The general organization of the house consisted of storing toys, clothes and shoes; getting the garbage; making the beds; tidying and cleaning wardrobes and mirrors (Figure 1). Several of these tasks were performed simultaneously. All tasks were held upright without breaks, with the repetitive use of the spine, knees and ankles bending or twisting.

To clean the floor, the housemaid had to sweep, scrub and dry floors. This activity required the worker to move continuously with the spine in at-bent twist due to short cable squeegees and brooms (Figure 2). The housemaid also had to carry heavy buckets by excessive physical and postural exertion, manifested by imbalance of the march, lever burden on the higher members and the spine as well as airflow limitation by sharp contraction of the chest muscles in order to sustain weight in his arms. In addition, the buckets had unstable handles that required great flexor effort of fingers and wrist to hold them while carrying water. The housemaid wore a slipper that did not guarantee security or stability for the march, increasing the need for efforts on ankles and feet.

To put the clothes in the washing machine, the housemaid lowered and raised herself several subsequent times through repetitive movements of ante-bending and twisting of the spine with some weight in her arms and fingers flexed against resistance to return to the standing position (figure 3). This problem could be minimized by placing the bucket in a position above the ground (on a bank, for example).

The activity of ironing was sometimes done using a bed as the ironing table. As the bed was low, the housemaid

Figure 1. House organization.
remained with sustained spine in flexion for about half an hour while doing this service. The correct use of a table to iron would certainly minimize this spine overload.

The kitchen cleaning demanded activities as washing, drying and storing dishes. We observed that the most used utensils in the kitchen, such as cutlery, plates and cups were stored at lower places of the cabinets, requiring repeated movements of flexion-extension of the spine (figure 4).

**DISCUSSION**

The findings described allowed highlight the following risk factors for WMSDs in domestic work: continuous dynamic muscle movement in the limbs under overload; repetitive or continuous movements, some under overload in ante-bending and twisting of the spine; improper handling of loads requiring effort or vicious attitude of the spine, knees and ankles; improper postures and tools with risk of accidents and diffuse myotendinous overload; and lack of housemaid’s awareness about the importance of minimizing situations of occupational risk.

With respect to each of these factors, the dynamic muscle movement causes the muscles to contract and relax several times, acting as a blood pump in which the contraction expels the blood with metabolic waste and the relaxation allows the replacement of renovated blood with nutrients and oxygen. However, as the muscles contract subsequent times long, its accumulated metabolic consumption exceeds the replacement so that functional ability of the muscle decreases by metabolic exhaustion, which can manifest in symptoms of weakness, fatigue, pain or subjective muscle discomfort.10

The observed housemaid, while organizing the house, moved by several continuous hours and without resting intervals, mobilizing many mioarticulars groups simultaneously or alternately in activities that required frequent posture changes, but all the time standing. In this case, even in a dynamic activity, the standing posture determining static strain on the muscles that may contribute to the occurrence of pain in the lower limbs. In fact, this was a complaint by the observed person, as described by Corlett and Manenica diagram showed in figure 5.

Furthermore, the standing posture impedes the venous return and thus elevates the blood hydrostatic pressure in the veins of the lower extremities, causing accumulation of liquids with swelling and pain in this region.14

The repetitive or continuous movements, some under overload in ante-bending and twisting of the spine, may be related to the back pain complaint, as described by her through the Corlett and Manenica diagram.

The explanation for this may come from the fact that the human spine is a segmented and complex osteoarticular system that has supporting, balance, posture and movement
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The loads lifting must always be performed with the column in vertical position, using the muscles of the legs which are more resistant. The spine is able to sustain axial or vertical direction forces, but is extremely weak to forces acting perpendicularly to its longitudinal axis.\textsuperscript{20}

This physiologic aspect can be explained by the fact that the intervertebral disc is constituted by a thick outer ring, formed by fibrocartilage, called the fibrous ring and pulposus nucleus consists of central gelatinous material. The collagen fibers in the ring form angles of approximately 30° to each other and are fundamental in the disc mechanics. Depending on the load applied to the rings, there may be disruption of this collagen microstructure. The nuclei of young healthy discs consist of approximately 90% of water and the remainder by collagens, proteoglycans, and osmotically active ions. The high water content of the nucleus protects them against compressions.

Mechanically, the rings act as springs that join the vertebral bodies to the nucleus. During flexion and extension of the spine, the vertebral bodies compress one side of the intervertebral ring and distend simultaneously the opposite side.\textsuperscript{21} At physiological levels, this movement contributes to proper blood supply to the disk and determines the transtisular water exchange necessary to adapt the pressure on the spine. This adaptation is what causes the intervertebral discs act as load shock applied axially on the column.\textsuperscript{21, 22}

Thus, when a disk is compressed, it fits losing water and absorbing sodium and potassium until its internal electrolyte concentration is sufficient to prevent any further loss of water. When this osmotic equilibrium is reached, the disc internal pressure becomes equal to the external pressure, which corresponds to the disk adaptive threshold. A continuous overload for a period of several hours results in reduced blood perfusion of the disk and an additional loss of intradiscal fluid beyond its adaptive capacity and can lead to degeneration or disc shifts that ultimately can cause a disc protrusion with neurologic compression and their clinical and functional repercussions.\textsuperscript{21, 22}

Returning to the lumbar discomfort complaint filed by the observed housemaid, we observed that this postural discomfort by itself is an indicator of antiergonomic use of motor structures of this body region. Associated with repetitive and stents movements that employ excessive force, it favors the passing of anatomical and functional capacity tissue and can cause damage to musculoskeletal and osteoarticular structures involved in the operation of the spine.\textsuperscript{23}

In this case, the bending associated with weight lifting practiced in function of the working activity can be an important cause of lumbar embarrassments and symptomatic and functionally limiting spinal injuries and their connections. Incidentally, this is the most common cause of recurrent work absences.\textsuperscript{23}

As the incorrect handling of loads, the use of inappropriate tools can also affect the spine structures, since they can lead to maintenance antiergonomics postures as it was observed.

For the maintenance of posture and efforts in anterior flexion of the spine, the muscles and the dorsolumbar ligaments need to remain in continuous contraction, causing increased pressure on the intervertebral discs and strain on
the paraspinal ligaments, with consequent onset of neck and back pain.24

Ergonomically it is ideal that the cables brooms and squeegees are in the height of the shoulder line of those who will use them so that the hands can hold them in a height above the line of the elbows. This posture keeps the spine straight, avoiding overloading its structures.25

Regarding the task of ironing, it requires a static posture of the lower limbs and spine, with repetitive adduction-abduction movement of the shoulder and flexion-extension of the fingers. To protect the column from a position in flexure and consequent overload paravertebral myotendinous, it is important that the height of the bench is adjusted to move according to the working height, should be located 18 cm below the elbow flexed to 90°.26 When passing the clothing on a very low bed, the observed housemaid was exposed to the development of important new health problems on your spine in addition to those already seen in other activities that she played.

According to the literature, the main causes of work-related diseases are associated with inadequate work activities to the human body, which mainly involve issues related to the pace of activities, repetitive movements, overload muscle, absence of breaks and the use of inadequate equipment.26, 27 All this was present in the work of the housemaid observed in this study.

In this case, intermittent breaks and systematic switchover between activities are important for continuous overload relief on specific muscle groups while also bring benefit to the mental activity of management of the own activity.28,29

In this regard, it is known that work breaks allow relief to the most claimed muscles for labor activity and mental rest by providing moments of lower concentration; therefore the work breaks are essential to prevent musculoskeletal pain and mental fatigue.28,29

To avoid accidents and WMSDs, the adequacy of clothing and work tools to the task being performed and the worker’s body functional structure is as important as taking care of the posture and movements. In this sense, the World Health Organization (WHO) warns of the importance of preventing musculoskeletal disorders through proper management of the work environment, the correct setting of the equipment and its use, and the organization of instruments and work method. This warning includes diagnosis and precise approach of environmental, labor and medical problems related to WMSDs as strategies for the benefit of the worker and the actual result of the work.30

Another noted aspect, not ergonomic, but with impact on this sphere, was the lack of planning and organization of the work environment, the correct adjustment and use of equipment.31,32 This warning includes diagnosis and precise approach of environmental, labor and medical problems related to WMSDs as strategies for the benefit of the worker and the actual result of the work.30

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Regarding WMSDs, as risk factors in observed domestic work, the repetitiveness of ante-flexion and spine twist and dynamic work in long standing position of the lower limbs stood out. These factors might be related to the symptoms of pain and discomfort manifested by the housemaid.

Then we observed the weight lifting in an anterograde way, the inappropriate use of inadequate tools and equipment to the task in which they were used, resulting in mioartrotendineous supraphysiological postures and overload, the lack of planned activities, disorganized environment adding risk of accidents, no use of appropriate protective clothing or equipment and lack of awareness of working on all these issues. This lack of awareness prevented the housemaid applies protective measures to her own health, to her well-being and to her productivity, what reduced the efficiency of their movements and postures over the conduct of her work activity process.

In addition to these objective questions and despite the limitation of this study to allow generalizations because of the epistemological nature of the method, it was possible to reflect on domestic work as an activity that seems to dispense with any technical or scientific support for its implementation, as if it depended only on a set of instinctive actions destined for a result in which the process to achieve does not need to be considered.

In this way, the body of the housemaid becomes to be used as any other non-human tool and therefore exposed to the same type and wear process as a device that requires no maintenance and that is consumed over time and use.

However, the housemaids are human workers who, being neglected, suffer physically and mentally without this being recognized, even burdening the Health System and the Social Security System with their problems preventable by relatively simple measures proposed by the ergonomics, by the physical therapy, by the occupational medicine and by several other areas of applied knowledge.

Are mood disorders and WMSD, manifested by anxiety, sadness, frustration, as well as everyday pain, injuries, disorders and derivatives mioarticolares disabilities of mental alienation, lack of information as the application moves, appropriate body postures and use correct tools and other equipment, factors that are absent in the work activities of a domestic worker.

**Final Considerations**

This study approach to focus the WRMD in home workers, but allowed to expand slightly in the direction of occupational accidents and reflect on social policy issues related to the profession of a maid. Exceeded the goal and the possibility offered by the methodology also addressing biological accidents that home workers are potentially exposed.

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In this environment, the establishment of political and social measures and technical actions that enable to properly care the work and the housemaid is needed, among which it is possible to propose monitoring and continuing education programs for housewives (mistresses) and her housemaids about the occurrence of WMSDs and other occupational diseases, and the creation and standardization of protocols and guidelines for the management and enforcement of domestic labor activities focusing on worker health.

In terms of individual care, it is important that housemaids carry out their activities under proper guidance as to the movements, to the posture, to the use of tools, clothing and equipment, as well as to the safety in the workplace. It is necessary that the housemaids alternate between the various activities throughout the working day to avoid continuous and vicious use of one specific muscle group and have regular periodic rest breaks throughout the day. These measures should aim at the whole body and mind set of the worker. However, in the case of WMSDs, it is important to emphasize the need and the importance of preserving the spine and lower limbs because these are the areas that are most heavily burdened by domestic labor activity.

As health professionals, it is important that they remain attentive to so common occupational problems in housemaids through an expanded and comprehensive care centered on the person provided by a multidisciplinary team, which should participate, too, the housewife and her housemaid.

REFERENCES