Universidade Federal de Pelotas
Departamento de Medicina Social
Programa de Pós-graduação em Epidemiologia

Trabalho Infantil e Saúde:

Perfil Ocupacional e

Problemas Músculo-Esqueléticos

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Dissertação apresentada à Universidade Federal de Pelotas, sob a orientação do Prof. Dr. Luiz Augusto Facchini, como parte das exigências do Programa de Pós-Graduação em Epidemiologia para obtenção do título de Doutor

Pelotas, julho de 2000

Para Ana e Pedro, minha família

AGRADECIMENTOS

Às crianças entrevistadas pelo estudo e suas famílias pela paciência e disponibilidade com que responderam as nossas perguntas.

Aos auxiliares de pesquisa pela perseverança quando o trabalho de campo e a entrada de dados pareciam não ter mais fim.

Ao Rodrigo e à Juliana por serem incansáveis na limpeza dos dados e pelo entusiasmo, curiosidade e sagacidade que os fez continuar participando deste projeto.

À Fátima pelas muitas dicas na revisão bibliográfica e pela eficiência com que intermediou o meu contato com o resto da equipe quando eu estava no exterior.

À Mercedes pelo excelente trabalho de secretaria executiva e ao Alessander pela competente assessoria de informática que possibilitaram o bom andamento deste projeto de pesquisa.

Aos meus colegas do Takemi Program in International Health, em particular a Mavis Hermanus e Marilen Danguilan pelas inúmeras vezes que contribuíram com perguntas instigantes e sugestões criativas para o desenvolvimento deste trabalho.

Aos meus colegas do Grupo de Discussão sobre Direitos da Criança do Harvard Center for Population and Development Studies por me ajudarem a compreender a real dimensão e a complexidade do problema que eu estava estudando.

À Marinel por ter me estimulado a estudar trabalho infantil e saúde e pela competência com que coordenou o trabalho de campo e a entrada de dados.

Ao David Christiani, meu orientador no Takemi Program, pela dedicação e pelas críticas e sugestões a este trabalho.

Ao Facchini , meu orientador, meu professor, meu amigo, por ter usado todos os meios de comunicação disponíveis para estar perto mesmo quando longe, incentivando, discutindo as dificuldades e participando em todos os momentos da construção deste conhecimento.

Aos meus pais e irmãos por me apoiaram em todo os momentos.

APOIO FINANCEIRO

Este estudo foi financiado pelas seguintes agências brasileiras de fomento a pesquisa: CAPES, Ministério da Educação; CNPq, Ministério de Ciência e Tecnologia e Rede Unitrabalho. Este estudo foi também apoiado pela seguintes instituições: Fulbright Scholars Program; Organização Pan-Americana de Saúde e pelos programas da Harvard School of Public Health, Boston, USA - Takemi Program in International Health através da Merck Company Foundation e Harvard Program in Occupational Safety and Health através do NIH ESO 002 e da Liberty Mutual.

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Problems and Perspectives

Publicado no International Journal of Occupational and

Environmental Health VOL 6/NO1, JAN-MAR 2000

Pelotas, julho de 2000

Title: Child Labor and Health: Problems and Perspectives

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- The Health Office of Pelotas, RS, Brazil (MMD'A); and
- The Occupational Health Program, Department of Environmental Health, Harvard School of Public Health, Boston, Massachusetts (DCC).

Supported by

- CAPES – Ministry of Education, Brazil;
- The Fulbright Scholars Program; and
- The Takemi Program in International Health through the Merck Company Foundation

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ABSTRACT

Child labor remains a widespread problem. Although it can have positive effects, in some situations it has negative effects on health and development of the children. Although mainly a problem in developing countries, it is also possible to find child workers, some working in hazardous activities, in developed countries. The authors describe the child labor profiles in developed and developing countries, the principal occupations of children and their concomitant hazards. They summarize the epidemiologic evidence for a greater impact of some occupational exposures on the health of children as compared with adults, and the theoretical concerns about the impact of child labor on health, and suggest policies that can be used to combat harmful child labor.

Key words: child labor, developing countries, developed countries, occupational health

INTRODUCTION

Child labor remains a widespread problem in the world today. There are at least 250 million working children between the ages of 5 and 14 in developing countries, but due to imprecision in the estimates, some authors believe that this number could be much higher, reaching 500 million children. The majority of the child workers live in the developing countries of Latin America, Asia, and Africa, but there are also pockets of child labor in many industrialized countries. [1, 2]

There is a consensus that work can have positive effects on children, such as the development of discipline, responsibility, self-confidence, and independence; teaching children how to manage money; and providing valuable models to teach them work skills. On the other hand, work can also have a negative impact on health and development of the children. [3]

The plain fact that the children are working is not a concern in itself, but it is the types of work they perform that will determine whether work is harmful to them. Child labor is more harmful if it occurs at younger ages; interferes with school, recreation, and rest; involves an erratic work schedule, long hours or frequent nocturnal work; or includes hazardous occupations and low wages (Figure 1). [4]

Some child labor is clearly light, such as the activity performed by a child delivering newspapers for two hours a day. This work is not likely to harm the child's health or development, or reduce his or her attendance in school. But even in this situation there is some level of exploitation in the fact that the child probably receives a lower wage than an adult would receive to perform the same job. There are also some socially or morally intolerable forms of exploitation, such as child prostitution, which

most people would agree it is necessary to eliminate. Even so, it is very difficult to get consensus on how to address this problem. However, most of the jobs children do do not involve extreme situations such as the ones noted above, and hence it is necessary to balance their beneficial and harmful aspects in order to define which occupations are appropriate for children. [4]

In most countries it is possible to find children working in very hazardous conditions, that is to say, exposed to objects, substances, or conditions, with the potential to have adverse effects on humans. But it is difficult to find good data about the impact of child labor on health to evaluate its harmful aspects. Some environmental epidemiologic studies and research on young workers suggest that children could be at higher health risks than adults are when exposed to the same hazards. Moreover, several theoretical concerns about the impact of occupational exposures on child health need to be studied. [1, 3, 4, 5]

In this article we describe the child labor profile in developed and developing countries, summarize the epidemiologic evidence that some occupational exposures are more hazardous to children than to adults, and outline the theoretical concerns about the impact of child labor on health. In addition, we suggest policies that could be used to combat harmful child labor.

We consider child labor to be activities performed by persons less than 18 years of age that contribute to the production of a marketable product, good, or service, whether that activity is done for pay or not. This includes household work performed in the parents' home in situations where such work can be assimilated to an economic activity, as, for example, when a child must devote his or her entire time to that work so

that his or her parents can be employed outside the home and is therefore deprived of the possibility of going to school. We also use “child work” as a synonym of child labor.[3]

THE CHILD LABOR PROFILE

It is very difficult to estimate the number of child workers in the world. Definitions of child labor vary greatly in terms of the ages and activities covered by the statistics, preventing valid comparisons. Moreover, child labor has a hidden nature, as great numbers of the children are working in the informal sector and some are in illegal situations, making it very hard to generate reliable national statistics. [6]

The available statistics indicate that about 96% of child workers are in the developing countries of Africa, Asia, and South America. It is important to consider that these regions account for 87% of the children under 18 years old of the world. Considering child workers between the ages of 5 and 14, Asia makes up 61% of child workers in developing countries, while Africa accounts for 32%, and Latin America 7%. However, while Asia has the largest number of child workers, Africa has the highest prevalence of child labor (40%), and in Latin America, one child in five works. [2, 4, 7]

Although child labor is primarily a developing-country problem, it is emerging in many East European and Asian countries, which are in transition to a market economy. When considering all forms of child labor, the prevalences in developed countries are surprisingly high. A study in United States found that 80% of high school students surveyed reported that they held jobs during the school year at some point during high school. Research in the United Kingdom showed that between 15 and 26% of children

11 years old and between 36 to 66% of children 15 years old were working. Some of these workers are engaged in hazardous jobs. [2, 3, 4, 6]

Therefore, in addition to the differences in the size of the problem, there are also differences in the characteristics of child labor between developed and developing countries. In developing countries, the children start to work at a very young age, some are malnourished, many work for long hours in hazardous occupations, and they frequently do not attend school. They receive very low wages or are unpaid, and their incomes and help are usually essential for family survival. They are mainly employed in the informal sector. Bonded labor, the virtual enslavement of the children to repay debts incurred by their parents or grandparents, remains a problem in several regions. For the most part, children work in jobs related to internal markets. It is estimated that probably less than 5% are employed in export industries. [1, 4, 8]

The developed countries have apparently been able to eliminate bonded labor and street work. Moreover, the informal sector is much smaller than in the developing countries, and child workers generally attend school. Some relatively wealthy children work for discretionary money. But child labor, including hazardous forms of it, can be found in most rich countries, and very poor people, especially ethnic minorities and migrants, can face child labor conditions similar to those in developing countries. [4]

As set forth in the ILO Convention 182, the worst forms of child labor should be prohibited and eliminated. The worst forms of child labor includes all forms of slavery or practices similar to slavery; the use, procuring, or offering of a child for prostitution; and the use, procuring, or offering of a child for illicit activities or work that is likely to harm the health, safety, or morals of children. This is a challenge for governments that need

to prepare themselves to offer reasonable alternatives to child labor. Some such alternatives are discussed bellow. [2,9]

CHILDREN'S ACTIVITIES AND THEIR HAZARDS

Many of working children labor in very dangerous or hazardous occupations, such as agriculture, manufacturing, construction, retail, and marginal economic activities. A quick overview on the characteristics and hazards of these appears bellow.

AGRICULTURE

Agriculture is the most common child occupation worldwide, employing more working children than any other sector. This activity is consistently ranked among the most hazardous industry in terms of both mortality and morbidity. [10, 11, 12]

Despite its hazards, however, agriculture is one of the less regulated sectors, and it is among the sectors where existent laws are very difficult to enforce. [3, 12]

Moreover, most farms are no longer family units where the children are helping their parents with the daily chores and learning their future job. There is an international trend towards mechanization, specialization (monoculture), and technologic advances in the fields. These processes decrease the numbers of farms, especially small family farms, reducing the numbers of workers employed, with concomitant increases in the sizes of farms and in productivity. Thus, there are fewer children and adolescents of the owners working on farms, and more adolescents hired as farm workers or farm workers' children that are working alongside their parents in the fields. [3, 12]

The children generally start to work in agriculture at very young ages and usually work for long hours for little or no payment. The seasonal characteristics of the work,

the long hours required, the distances from school, and the lack of schools with higher grades in the rural areas are some of the factors that reduce school attendance. [12]

In agricultural work, children are exposed to dangerous farm machinery, which is a common cause of fatal and nonfatal injuries, whether they are operating or just working near these machines. Children are also exposed to strenuous labor, such as carrying or lifting heavy loads and working in uncomfortable positions such as stooping in the same position, or bending very frequently. These ergonomic hazards could affect their musculoskeletal development. Other hazards present in the fields are pesticides and adverse weather, especially heat, which can be particularly dangerous for children. Poor field sanitation contains its own hazards, facilitating the transmission of communicable diseases and worsening the pesticides and the heat hazards due to the lack of potable water for drinking and washing. Migrant workers can be particularly at risk since their housing conditions are frequently inappropriate. [3, 12, 13]

MANUFACTURING

Manufacturing very often uses child labor, but the types of industry vary widely from country to country. Most of these children are employed in small workshops or in home-based work. They seldom work in medium-sized or large enterprises, but such establishments sometimes contribute indirectly to child labor by subcontracting out certain production tasks to small workshops and home workers that make extensive use of child labor and generally are not covered by national child labor laws. [4, 8,13]

Industry has hazards linked to production processes that are specific to the tasks performed. On the other hand, there are some general hazards that arise not from the production process but from negligent management. Examples of these problems are

naked electric wires, lack of first aid facilities, poor ventilation, lack of sanitation, lack of sufficient light, heavy lifting, exposure to loud noise, proximity or operation of dangerous machines, and the lack of protective equipment. In some cases physical punishments are frequent. [14]

Specific hazards vary according to the industry type. Thus, child workers will be exposed to high temperatures, to high risks of accidents caused by cuts and burns in the brassware and glass-bangle industries, to silica dust in the earthenware and porcelain factories, and to chemical hazards and risks of fire and explosion at match and fireworks workshops. [4, 8]

Child workers are also exposed to important hazards in the export sector. In the carpet industry in India, the children are exposed to repetitive movements, chemical hazards, inhalation of wool dust contaminated with biological agents, and ergonomic hazards. In the production of soccer balls in Pakistan, children are exposed to ergonomic hazards, and in the shoe industry in Portugal, Italy, and Brazil, children are exposed to glue. [8, 15]

Manufacturing is a very hazardous sector, and the subcontracting practices of manufacturers are an issue of high concern. Subcontracting divests the medium-sized and large-enterprise industries of hazardous activities by outsourcing this type of work to small workshops and home-based work, which frequently are exempt from existing legislation. Moreover, even if these establishments were covered by law, they are much more difficult to monitor and have less economic capacity to work towards higher standards. [13]

CONSTRUCTION

Even for adults, the construction sector presents a very high risk of accidents. Despite this fact, this sector employs considerable numbers of children in several parts of the world. In Brazil, 4% of the workers between the ages of 10 and 14 and 8% of those between 15 and 17 work in the construction sector. In the United States, 2.5 % of teenaged workers are employed in construction, although this sector is responsible for 11% of the fatal work-related injuries in workers younger than 18 years old. In addition to the risk of accident, there are exposures to noise, silica, asbestos, harmful dusts, heavy loads, and many other hazards. [3, 16]

RETAIL

The retail sector employs half of the working teens in the United States, for the most part in restaurants. This sector is responsible for half of the nonfatal injuries that occur in adolescents between 14 and 17 years old and 20% of the fatal injuries that occur in children less than 18 years old, in United States. Although this type of work seems to be safe, some tasks can be very hazardous and are forbidden by law to be performed by teens, such as working with hot grease and slicer machines. Since job titles may not reflect the natures of the tasks performed, it is difficult to distinguish the activities that are legal from those that are in violation. Also, these sectors often require long hours of work and changing schedules, which can entail leaving the work late at night and difficulties in combining work and school. [3]

MARGINAL ECONOMIC ACTIVITIES

Domestic services

The informal and hidden nature of the domestic work makes difficult to estimate the number of domestic workers around the world, but it is one of the most common forms of urban child labor in developing countries and employs a large number of girls. In Brazil, 8% of workers between the ages of 10 and 14 were found to be domestic workers. [13]

It is very difficult to study domestic workers since it is hard to contact them in order to obtain interviews. But it is known that domestic service does not need to be hazardous, although frequently it is. Workers often live in the workplace, are expected to work at all hours of the day with few days off, and are deprived of attending school. Far from their own families, they are very vulnerable and can receive harsh treatment from their employers, sometimes suffering physical, mental, and sexual abuse. In some cases, they lack appropriate places to sleep and do not receive sufficient food. They usually receive low or no wage; bonded labor is very common in some places. [4,13]

Commercial sex workers

Child prostitution has been defined as “the act of engaging or offering the services of a child to perform sexual acts for money or other consideration...”. This definition emphasizes that child prostitution is committed not by children but by the adults who engage in prostitution or offer a child’s sexual services to others. [13]

Non-Governmental Organizations estimate that at least 1 million girls worldwide are lured or forced into this scandalous form of child exploitation. Child prostitution is more frequent in developing countries, such as Brazil, where 200,000 children are

exploited, but it can be found in developed countries such as the United States, which has at least 100,000 child prostitutes. Although girls are the most frequent targets, boys are also often exploited. There are documented cases of children as young as 6 or 7 being exploited in this way in Brazil. While this huge problem may be widely visible to child-prostitution exploiters, it remains virtually invisible to the people who could help these children. [4, 14, 17]

Commercial sexual exploitation frequently involves trafficking of children whether they are kidnapped or sold by their parents. Children are often recruited under the false pretense of marriage or a good job in the city. While the main media focus is sex tourism, in which persons from developed countries travel to developing countries in search of sex with children, it is important to keep in mind that local persons also exploit these children. But the new face of exploitation is transnational, with criminal networks that take place not only in neighboring countries but also across the globe. [4, 13, 17]

Child prostitutes face a very hazardous form of exploitation once they suffer extreme physical and mental abuse. They also risk drug addiction, early and unwanted pregnancies, and HIV and other sexually transmitted diseases. [4, 13]

The process of rescue and rehabilitation of these children is very complicated. They are frequently prosecuted by the system that should be protecting them. Even if they manage to return to their homes, they often face stigma and rejection by their families and communities. [4, 13]

Street workers

With its high level of urbanization, Latin America has the largest number of street children. In the Russian Federation after the transition to a market economy, street child

labor is a growing problem. Many of them are not street children in the strict sense, since the majority of these street workers return home each night and provide critical financial support for their families. [4]

They perform jobs such as shining shoes, washing and guarding cars, carrying luggage, selling goods at traffic-light intersections. They also scavenge garbage dumps and waste bins, and search the streets picking up used papers, plastics, rags, bottles and tin and metal pieces to sell to recycling enterprises.[4]

Street workers are mainly exposed to street violence. Many are lured to drugs, prostitution and illegal work (thieving, trafficking in drugs). They often need to defend their spaces on the street, and can be prosecuted by the police (in Rio de Janeiro, Brazil, for example, three street children are killed every day, many by the police). They are also exposed to traffic accidents and extreme weather conditions and seldom attend school. [4]

Scavenging is one example of a very hazardous street work. It adversely affects the child's self-esteem and is very unhygienic. [4]

Work for the family

While working for their families, children can learn from a reasonable level of participation in the household chores that can develop a sense of self-worth. But sometimes, working for the family is essential to enable the parents to work outside the home. [4]

This is a hidden form of exploitation that affects mainly girls and it is often not even considered work. In Brazil 4% of children between the ages of 10 and 14 and 9%

of children between 15 and 17 perform exclusively household activities without attending school. [16]

Work for the family can demand long hours, thus preventing the children from going to school or doing well in school, perpetuating the poverty cycle. It also includes some heavy chores such as taking care of siblings and carrying heavy loads of firewood and buckets of water. [4]

EXPOSURES PARTICULARLY DANGEROUS FOR CHILDREN

Children are susceptible to all of the dangerous exposures faced by adults when placed in the same environments. However, children differ biologically from adults in their anatomic, physiologic, and psychological characteristics because they are undergoing process of growth and development. Thus, exposure hazards that affect adults can affect children much more strongly. [2, 8,14] In this section we examine the epidemiologic evidence and theoretical concerns with respect to exposures that could be particularly dangerous for children.

Epidemiologic Evidence

Most of the studies of impact of child labor on injuries have taken place in the United States. These studies show that children have a higher risk of injuries than adults. In a U.S. study, teens between 15 and 17 were found to have an injury rate of 4.9 per 100% full-time equivalent workers, while in the group of 16 years of age and older this rate was 2.8. [3]

Other epidemiologic evidence that highlights the danger of exposures for children comes mainly from studies of young workers and from environmental studies. These

studies show that children have higher susceptibility to toxicity from lead, silica, and benzene. In addition, children are more susceptible to noise, heat, and ionizing radiation. [3, 14]

Theoretical Concerns

Work environment.

The Institute of Medicine report raises concerns that inappropriate assignments of children to perform tasks that they are developmentally incapable of undertaking result in hazardous activities. Inappropriate structuring of difficult work schedules (long hours, early/late hours with frequent changes) and lack of supervision could increase the risk of work-related injuries and illnesses. Also, such characteristics of children and adolescents as inexperience, lack of physical and emotional maturity, adolescent sleep needs, and the need to balance school and work would necessitate environments that are structured to minimize the risks to which young people are exposed. [3]

Ergonomic factors.

The report also focuses upon the developmental factors that could put teens at a higher risk than adults. Childhood and adolescence are periods of rapid growth in a young person's life. Thus, they could be at particularly high risk of injuring ligaments and damaging bone-growth plates. Although little research has been done on the long-term consequences of premature exposure to heavy work and to repetitive back-straining movements, ergonomic factors, nevertheless, remain a concern. [3]

Carcinogenic exposures.

Expert panels have hypothesized that children are particularly vulnerable to potential carcinogens due to their rapid cell growth. [3, 8, 14]

Chemical exposures.

There are concerns that chemical exposures could have adverse effects on normal hormonal development of adolescents, altering the delicate balance of hormones and their feedback loops. Chemical exposures could result in devastating effects, given the importance of the endocrine system during this life period. Some authors also believe that exposures to toxic chemicals at a very young age may alter the body's response to future toxic exposures. [3, 8]

Long latency period.

Rapid cell growth could strengthen the exposure effects, thus shortening the latency periods of some diseases. Even in situations where this does not happen, children have longer periods of exposure to cumulative hazards. Precocious exposure might predict that children become ill in young adulthood instead of at older age. [8]

Machines, tools, work furniture, and personal protective equipment are not designed for children.

Children using machines, tools, and work furniture (seats, workbenches, etc.) designed for adults may develop musculoskeletal disorders such as chronic repetitive-strain injuries, repetitive-motion trauma, back problems, tenosynovitis, vibration-induced disorders, and white-finger syndrome. They may also be at higher risk for injuries due to fatigue.

Moreover, personal protective equipment is made for adults and frequently does not fit children. Thus, they often have to work without it or use alternative devices that do not provide real protection. [8]

The appropriateness of permissible exposure limits for children established for adults.

Since children respond differently than adults to physical and chemical exposures, the permissible exposure limits (PELs) established for adults might not be sufficiently protective for children. Thus, children should not work in environments with such exposures until more is known about their effects on child health. [8]

INTERVENTIONS TO COMBAT CHILD LABOR

Although most people agree that harmful child labor should be eliminated, controversy nevertheless remains about the possibility of accomplishing this without eliminating poverty. [4, 15]

Of course, the reduction of poverty, one of the prominent causes of child labor, is a very important issue and should be addressed. But child labor can also perpetuate the poverty cycle, and children, however poor their families might be, should not be harmed by work. [4]

Thus, the goal must be the elimination of harmful child labor, realizing that it will not be eliminated overnight. In this process it is important to establish priorities and try to offer as much protection as possible to child workers. [15] The priorities also seem clear, and they should include the removal of child workers from hazardous work and bonded labor and the prevention of child labor at a very young age. [15, 18]

In the next section we will outline the main types of interventions that could be used to combat harmful child labor.

Child Labor Law and Enforcement

Historically, an important response to child labor has been the adoption of legislation to regulate the admission of children to work and the conditions under which the legislation is undertaken. [15]

Child Labor legislation needs to be updated, and it is necessary to develop ways to enforce it. The large child-worker concentrations in the informal sector and agriculture indicate that this initiative needs to be articulated with other mechanisms that can support and complement the law enforcement. [15]

Education

Primary education.

Schools can play a major role in the battle against child labor. Making primary education universal is still a challenge for developing countries, but reaching this goal can have an immediate impact on the reduction of child labor. [13]

A great majority of countries have laws establishing compulsory education. But the existence of this law is not sufficient. Many developing countries have a long way to go before they can provide enough schools that are within reasonable traveling distance for all children, and free of charge at least for the poor. Moreover, it is necessary to improve the quality of the public schools. To be attractive to working children, schools need to make a difference in their chances to get better jobs. Also, it is necessary to remember that working children frequently are living in extreme poverty, often to the point that in many cases, schools will need to provide minimum conditions to make it possible for the children to learn: books, meals, and flexibility in the school calendar in order to accommodate their seasonal work. As mentioned earlier, children's income is

very often essential to family survival. Thus, once enrolled in school, working children will need to work less or stop working. In many cases, outside financial support will have to be provided for the family as, for example, scholarships. [4, 6]

Education on child labor.

Developed and developing countries need initiatives in the education of children, parents, teachers, physicians, and employers about child labor and its hazards. Once enlightened about the problem, they can make a difference in decisions whether or not to have children start to work and with respect to the types of jobs chosen.

Education in occupational health and safety.

Knowing that there are hazards in most jobs, it is important to educate young workers about occupational safety and health. This initiative should raise awareness about workplace hazards and ways of preventing illnesses and injuries; raise awareness about their rights on the job and resources available to assist and encourage them to be active participants in creating and maintaining safe and healthful work environments. [19]

School-to-work programs.

Vocational education teaches knowledge and skills for employment in specific fields. This type of training can qualify the teen jobs and build a bridge between the school and the work environment, which sometimes appear to be very disconnected from the real world and future adult jobs. [3]

Market-based initiatives

Market-based initiatives have played an important role in raising public awareness, particularly in developed countries, and represent a strategy that can be

explored in developing countries. These initiatives include a variety of product-labeling schemes and/or corporate codes of conduct designed to inform consumers that the goods they are buying are not made or processed by children. However, to avoid the migration of the child labor to more hazardous, more hidden, and worse paid jobs, these policies should be complemented by investments in schooling and the inclusion in the codes of conduct of the payment of decent wages for adults, so that the need of the families to rely on child labor may be reduced. [6]

Long-term initiatives

Poverty alleviation programs that generate income and employment can also have a long-term impact in the reduction of child labor. [15] Government's challenge, then, is to articulate different policies and to provide reasonable alternatives to child labor, specifically, primary education should be universal and should be of good quality, and, for families that depend upon child labor to survive, other sources of income will need to be provided.

CONCLUSION

For teens, it is probably beneficial to work, in a non-hazardous job of low or medium intensity. Such work is better as the quality of work increases and bears a relationship to a future career. But child labor can have a major adverse impact on health and development, so it is important to eliminate child work in hazardous activities, child work in bonded labor, and the work of the children at very young ages.

The information system regarding this subject is very rudimentary. Thus, the system should be built such that it includes the agricultural sector and the informal

sector, the major child employers. Also, more research is necessary to evaluate illegal child labor, such as the work of the very young and work in activities such as prostitution and drug trafficking.

The impact of child labor on health is an issue that needs further research. It is known that the children are subjected, at least, to the same exposures as adults performing the same activities. There is also epidemiologic evidence that children can be more susceptible to some exposures than adults are. But there is much yet to be known; many theoretical concerns about the higher susceptibility of children to exposures need to be studied.

The shape of child labor is very dynamic and changes in time. New trends need to be examined in order to establish their impacts on health. Things that have already happened in developed countries are beginning to occur in the most developed areas of the developing countries. More and more children combine school and work, so if, on the one hand, the work is not depriving the child of school attendance, on the other it can be creating a great burden in terms of the time consumed byboth activities, reducing the time available for rest and play. [3, 16]

Another trend is the exclusion of the very poor from the market. It is already established that very poor children work in more hazardous jobs than advantaged children. Moreover, as markets become sophisticated, the very poor, who are the ones in most need, have difficulties finding jobs, since they do not have the minimum necessary skills. This trend reinforces the importance of primary education as a way to decrease the number of excluded people and minimize social inequities. [3, 16]

Some advantaged children, mainly in developed countries, work for discretionary money. Their pay represents relatively large amounts of money for people who not have family obligations and are not saving for future big expenses. Some authors have questioned whether it is beneficial to promote children's money-management skills, since it could generate subsequent dissatisfaction with their living standards when they need to deal with the general expenses of adult life.[3]

The developing countries have some particular problems that need to be studied. Most of the child workers in these regions are very poor, and an excessive number are malnourished. Thus, it is important to evaluate the impact of work exposures on malnourished children as a way to support the need for policies addressing the adequate food intake of workers in general and child workers in particular, such as the provision of meals at work.

Some activities that occur only in developing countries also need to be evaluated. Bonded labor is not justifiable in today's world and its elimination needs to be a priority in every place it exists. The huge informal sector is a phenomenon of current economies. In a small city in the south of Brazil 85% of the child workers are in the informal sector. Thus, despite the difficulties in accessing data about it, the informal sector, with its more visible and more hidden child labor activity, street workers, and domestic services, needs to be studied and covered by policies to combat child labor.

Another hidden activity in developing countries that cannot be forgotten is the exclusive household activities performed in their parents home without attendance at school. Almost nothing is known about the impact of this type of work on health. Work done at home usually has a poor status and is unpaid. Often it is not recognized as

work, and besides depriving children, mainly girls, of education, it can have important health consequences.

Policies to combat child labor should be as comprehensive and articulated as possible, and great care should be taken to avoid undesired consequences, such as the migration of child workers to the worst types of jobs. The priorities and the goals should be established according to the size and shape of the problem in each place. But it seems reasonable to say that, for the developing countries, the single most effective policy to combat child labor is the universalization of good primary education. On the other hand, in both developed and developing countries, the elimination of the illegal child work and the promotion of good jobs for teens, as apprenticeships for future careers are probably policies that should be applied.

BIBLIOGRAPHY

1. Parker D. Child Labor: the impact of economic exploitation on the health and welfare of children. Minn Med 1997;80(7):10-13-52-55.

2. International Labour Office. Child Labour: Targeting the Intolerable. Geneva, Switzerland: ILO, 1998.

3. Committee on the Health and Safety Implications of Child Labor. Protecting Youth at Work: Health, Safety, and Development of Working Children and Adolescents in the United States. Washington, DC: National Academy Press, 1998.

4. UNICEF. The State of the World's Children 1997. Oxford, UK: Oxford University Press, 1997.

5. Subida RD, Angluben RU. Defining Hazardous Undertakings for Young Workers below 18 Years of Age. Working Paper Series. Manila, Philippines: International Labour Office, 1997.

6. International Labour Office: Child labor: how the challenge is being met. International Labor Review. 1997;136:233-57.

7. Organización Mundial de la Salud. El Trabajo de los niños: riesgos especiales para la salud. Informes Técnicos. 52 ed. Vol. 756. Ginebra, Suiza: OMS, 1987.

8. Forastieri V. Children at Work: Health and Safety Risks. Geneva, Switzerland: International Labour Office, 1997.

9. International Labor Conference. Convention 182: Convention Concerning the Prohibition and Immediate Action for the Elimination of the Worst Forms of Child Labor. <http://www.ilo.org/public/english/10ilc/ilc87/com-chic.htm>, 1999 Geneva, Switzerland: International Labor Organization, 1999.

10. Cooper S, Rothstein M. Health hazards among working children in Texas. South Med J 1995;88:550-4.

11. Landrigan P, Pollack S, Belville R, Godbold J. Child labor. Pediatr Ann 1995;24:657-62.

12. Wilk V. Health hazards to children in agriculture. Am J Ind Med. 1993;24:283-90.

13. Bureau of International Labor Affairs. By the Sweat and Toil of Children, Vol. 5: Efforts to Eliminate Child Labor. ILAB's Child Labor Series. Washington, DC: U.S. Department of Labor, 1998.

14. Bequele A, Myers WE. First Things First in Child Labour: Eliminating work detrimental to children. Geneva, Switzerland: International Labour Office, 1995.

15. Fyfe A, Jankanish M. Trade Unions and Child Labor. ILO Child Labour Collection. Geneva, Switzerland: International Labour Office, 1996.

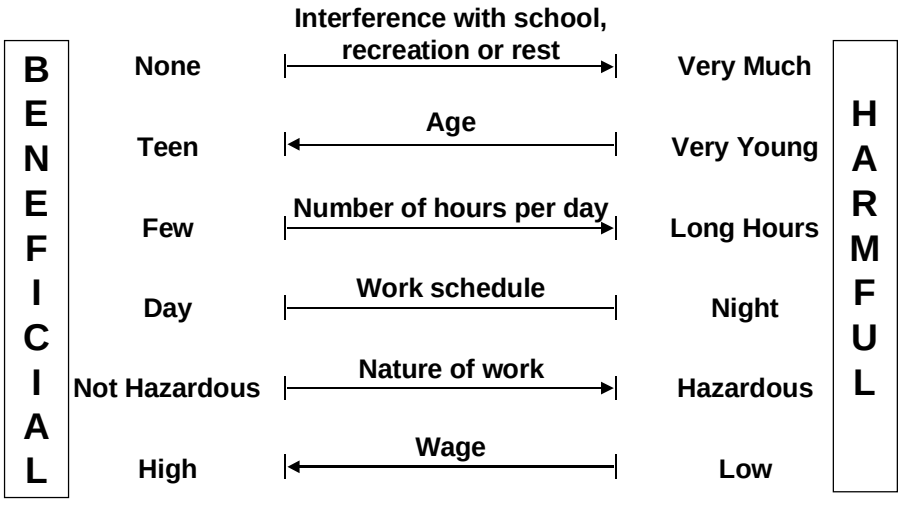
16. Fausto A, Cervini Ro. O Trabalho e a Rua: Crianças e adolescentes no Brasil urbano dos anos 80. São Paulo, SP, Brazil: Cortez Editora, 1996.

17. Bureau of International Labor Affairs. Forced Labor: The Prostitution of Children. Washington, DC: U.S. Department of Labor, 1996.

18. Fyfe A. Child Labour: A Guide to Project Design. Geneve, Switzerland: International Labour Office, 1993.

19. Children's Safety Network/MA Dept of Public Health. Safe Work/Safe Workers: A Guide for Teaching High School Students about Occupational Safety and Health. Newton, MA: Education Development Center, 1997.

Figure 1- Child Labor: Harm vs. Benefit



Universidade Federal de Pelotas
Departamento de Medicina Social
Programa de Pós-graduação em Epidemiologia

Artigo 2

Characteristics of Child Labor in a City in Southern Brazil

Submetido para publicação no

International Journal of Public Health

Pelotas, julho de 2000

Title: Characteristics of Child Labor in a City in Southern Brazil

Running Head: Child Labor in Brazil

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Word counts:

Abstract: 168

Text: 4,383

References: 410

Number of tables: 6

Key words: child labor, developing countries, population-based study, cross-sectional study

CHARACTERISTICS OF CHILD LABOR

IN A CITY IN SOUTHERN BRAZIL

ABSTRACT

Objectives: The study describes the characteristics of child labor in an urban population in southern Brazil, work locations and conditions.

Methods: We performed a population-based study with a cross-sectional design in a randomized sample of the low-income areas of Pelotas. All children between 6 and 17 years old in the selected areas were interviewed about their work, schooling and health. An adult in the household provided information on the family.

Results: Most child labor in the city was illegal. The workers started to work in a very young age, worked in hazardous activities, for long hours, some times at night, and for low wages.

Conclusion: The type of work children engage in routinely should be avoided if it involves conditions that could harm the child health and development and disturb school attendance or school performance. It is important to define polices that could avoid harmful child labor, increases awareness about the problem and at the same time offer alternatives to cover the family needs in terms of income.

INTRODUCTION

In the year of the 10th birthday of the Convention on the Rights of the Child, child labor is in evidence. Following an important decrease after the industrial revolution, child labor has increased and new problems have arisen as a result of economic globalization and the changes in work.

Child labor differs in magnitude and characteristics among the developed and developing countries but remains a problem worldwide. According to the ILO there are 250 million children under 14 years old working in the world, but some authors believe that this number is very underestimated and the real number could reach 500 million children. [1, 2, 3]

It is estimated that Brazil has 9,3 million children between 10 and 17 years old working and data from 1989 showed that 25 percent of the children in this age group were active in the labor force. [4, 5] The country combines a very heterogeneous situation. In the less developed areas of the country it is possible to find slavery and high prevalence of child prostitution. Street children are a widespread problem in the country, particularly in the big cities. On the other hand, in the most developed areas of the country the very poor do not even have the minimum skills to get a job.

Official data generally underestimate informal sector work, family work and frequently excludes the unpaid work. There are few population-based health studies on child labor, particularly in developing countries. [6]

To obtain detailed information about child labor, we developed a population-based study in a medium size city in Southern Brazil. Pelotas is located in one of the most developed areas of the country where the occurrence of scandalous child labor

exploitation seems unlikely. But the city is in a situation of economic stagnation and de-industrialization, leading to high rates of unemployment and an increase in the informal market. In this situation child labor could be an important family economic strategy.

This study describes the characteristics of child labor, health and education in the low-income areas of Pelotas and evaluates the associations between child labor and injuries, musculoskeletal problems, respiratory and behavioral problems.

In this paper we describe the characteristics of child labor in Pelotas in terms of demographic and socioeconomic aspects of the insertion of children in the labor force, the main types of work, the main jobs, the jobs status, the type of employer, the prevalence of the work at the informal market, the intensity of work and the types and amount of payment. Moreover, we evaluate the child labor in the city in the context of Brazilian law.

METHODOLOGY

In this paper we present methodological aspects related to the development of an occupational profile of children and teens. The impact of child labor on health and educational will be published in further papers. However, it is included the whole characteristics needed to the reliability of the study.

Through a population-based cross-sectional design we investigated a sample of 4,924 children between 6 and 17 years old in the urban low-income area of the city. [7, 8] The sample size was estimated to be sufficient to perform multivariate analyses in order to evaluate associations among child labor and health. Using as reference a child work prevalence of 10% and a health problem prevalence of 3% in non-working subjects, and

adding 15% to control confounding and 10% to control missing data it was estimated a sample size of 4,390 children. Thus this sample is large enough to describe child labor characteristics in the city.

Pelotas has an urban population of 265,192, with an average of 3.5 people per household and a proportion of 23% between 6 and 17 years. [9] The city has 70 neighborhoods that were considered low income areas with less than 1,5% of household heads earning more than 2,000 dollars monthly (US$ 100 = one Brazilian minimum salary). [9]

To reach the estimated children we randomly sampled 22 of the 70 neighborhoods. We interviewed all children between 6 and 17 years old in each household in the period between January to June 1998. A research staff of 24 students of medicine and nursing were specially trained to collect the data. Detailed maps of the sampled neighborhoods were used to cover the whole area. In each household, the mother or her substitute was interviewed about family aspects and child behavior while the children and teens between 6 and 17 years old were interviewed about their work, health and education.

The questionnaires were reviewed, the missing data and the imprecise answers identified and rectified whenever possible. Approximately 5% of the questionnaires were partially redone by supervisors to check the data quality.

The data set was codified, double entered in Epi Info 6.0, and the inaccuracies and inconsistencies were rectified. Data analysis was done using SPSS for Windows 8.0.0 and Epi Info 6.04b. [10, 11]

The work of children and teens was defined as activities performed by persons between 6 and 17 years of age that contribute to the production of a marked product, good, or service, including activities done without pay. Also, it includes household work performed in the parents home, when it can be assimilated to an economic activity as, for example, when a child must devote his or her entire time to that work so that his or her parents can be employed outside home and is therefore deprived of the possibility of going to school. However, since household work performed at parents' home is rather specific, it was not analyzed further in this paper.

The variables used in this paper are subdivided into two groups: explanatory variables (work of children and teens) and variables for stratification (from children and teens: schooling, age, and gender; from family: socioeconomic level). The characteristics of child labor were evaluated through unadjusted and stratified analysis.

Since the procedures of data gathering included only interviews, the project was approved and considered minimal risk by the Ethical Committee of the Federal University of Pelotas. [12] The researchers requested the parents, teens and children to provide informed consent to be interviewed, assuring the right to refuse to participate and complete confidentiality of the information.

RESULTS

We studied 4,924 children in 3,171 households in 22 low-income areas of Pelotas. We estimated that we were not able to interview 7.5% of the children in the target age group that live in these areas. Among the surveyed children, 51% were

males, 76% were white and 50% were from families with family income lower than US$ 375.

The great majority of the children older than 7 years old (n=4136) (age when usually they start the school) were attending school (95%) and 10% combined work and school. Among the study children, we found that 20.6% have ever worked, 3.4% were currently unemployed and 9.7% were currently working.

The prevalence of workers increased with age and was higher for males than for females. For males, the prevalence of workers in the age group of 6 to 9 years old was 2.4%; for the 10 to 13 years old was 10%, and for the 14 to 17 years old was 28.8%. The prevalence of workers among females was 0.5% in the age group of 6 to 9 years old; 4% for the 10 to 13 years old and 12.6% for the 14 to 17 years old (Table 1).

In the group that was working currently (476 workers), 70% were in the age group of 14 to 17 years old, 24.8% were 10 to 13 years old, while 5.3% were 6 to 9 years old; 71% were males and 87.7% of the workers older than 7 years old were also at school. Among the workers, 16.4% worked for the first time when they were 5 to 9 years-old, 40.5% were 10 to 13 years-old and 40.3% were 14 to 17 years-old. The males started to work in a younger age than females, 19.3% of the males worked for the first time when they were 5 to 9 years old while 10.6% of the females were in this age group when they worked for the first time.

Half of the child workers were working in services. Among them, half were enrolled in domestic, and half in non-domestic services. The second most frequent type of work was retail (34%). But there were also an important number of children working in construction (12.7%), manufacturing (4.7%) and marginal activities (2.5%) (Table 2).

Females were 3 times more prevalent in domestic services, and 37% more prevalent in retail than males, while males were 77% more prevalent in non-domestic services than females. Construction and manufacturing were almost exclusively male activities (Table 2). Non-domestic services, manufacturing and retail had the highest prevalence of attendance in school (more than 90% each). In domestic services and construction, the prevalence was around 80%, while marginal activities had the lowest prevalence (54.5%).

The most frequent jobs were stonemason assistant (10.1%), restaurant and groceries assistant (9.5%), seller (9.2%), yard cleaner (6.5%), nanny (6.1%) and maid (5.3%). The majority of the workers were employees (74.4%, n=352), 9.3% helped with family work, 9.3% were self-employed and 7.0% had temporary jobs.

Among the employees and the ones that helped with family work (n=396) half part worked for a boss, 36.7% worked for a parent and 15.5% worked for other family member. More than half of the child workers at the manufacturing, construction and retail sectors worked for their parents, domestic services had the highest prevalence of the children working for other family member (32.4%) while more than 60% of the workers in non-domestic and domestic services worked for a non-related boss (Table 3).

In Brazil, employees are required by law to have a card and when they are working employers are required to register the employment on their cards in order to acknowledge legally workers rights and benefits. But since children are not allowed to work before the age of 14, they can not possess the work card before this age. Hence, 83.2% of the employees that were between 14 and 17 years old were not registered

workers. Construction, manufacturing and retail were the types of work with higher prevalence of non-registered workers in this age group (94.3%, 86.7% and 86.4% respectively) while domestic services had a prevalence of 80.4% non-registered workers, and non-domestic services 75.7%. Among employees who were 14 to 17 years old and work for their parents, 97% were not registered while 92.9% of 6 those that work for other family member, and 73.8% of the ones that work for a boss were unregistered.

Despite the high prevalence of missing data about the number of hours worked (18.4%) it is possible to say that at least 31.8% of the workers worked 40 hours or more a week (full-time schedule) and 51.7% worked more than 20 hours a week. Among the workers who were 6 to 9 years old, 20% were already working full-time. Construction, domestic services and manufacturing had the highest prevalence of children working 40 or more hours per week (around 36% in each activity). The highest prevalence of part-time work was among marginal activities (41.7%), followed by non-domestic services (36.8%) (Table 4).

It was considered night work the work done from 6 PM to 7 AM. Despite the high prevalence of missing data for this variable (17.8%), were identified that at least 12.9% of the workers worked more than 10 hours per week in the evening or at night. The highest prevalence of work of 10 or more hours per week in the evening or at night were among workers on marginal activities (25%) and retail (19.9%). For non-domestic services, domestic services and construction the prevalence of evening/night work were respectively 11.4%, 9.4% and 6.7%.

Most of the child workers received money exclusively (71%), and 4.5% did not receive any compensation to perform their job. More males received money exclusively (75.6%) than females did (59.7%), while more females received money and other things, or other things except money (35.9%) than males did (19.8%).

Work in manufacturing and non-domestic services were the most frequently activities without any type of compensation (respectively 14.3% and 6.3%). Construction and non-domestic services were the most frequently compensated by money exclusively (89.7% and 86.6% respectively), while retail and domestic services were most frequently paid by mixed forms of compensation (42.1% and 29.8% respectively).

Among employees and children who helped with family work (n=396), parents were employers that most frequently compensated by mixed methods (money plus other forms or other forms except money) (45.2%). The prevalence of children who did not receive any compensation for their work was not different according the type of employer (around 4.5%), and non-related employers most frequently paid by money exclusively (83.3%).

Among child workers, 16.2% did not receive any money for their work and 58.2% had a monthly wage between US$ 1 and US$ 100. The average wage was US$ 61 per month (S.D. (standard deviation) US$ 72). The type of work that paid the highest wages was manufacturing (mean US$ 84, S.D. US$ 73.92), followed by non-domestic services (mean US$ 77.45, S.D. US$ 64.95) and construction (mean US$ 71.70, S.D. US$ 62.38) (Table 5).

DISCUSSION

This study has a wide definition of child labor including aspects traditionally excluded from the official statistics such as the unpaid work, informal work and the work of the very young. Thus, the study brings to light a lot of details about the characteristics of child labor in a medium-size city of Brazil.

The study in Pelotas showed lower prevalence of child labor, lower participation of the females in the labor force, lower intensity of work and higher prevalence of non-registered workers than the Urban Brazil. It also showed a lower proportion of child workers in manufacturing and higher proportion in services and construction when compared with data from urban Brazil (Table 6). [5]

The prevalence of child labor among the 10 to 14 years old varied little in the Brazilian urban context, with a prevalence of about 8%. On the other hand, the prevalence among teens (15 to 17 years old) varied widely according to the type of market. [5] Economic stagnation and deindustrialization of the city that decrease work possibilities for the general population, including this stratum of age, could explain the lower prevalence of child labor among the 15 to 17 year olds, and the lower prevalence of child in manufacturing when compared to the country as a whole.

The higher prevalence of non-registered workers and the lower intensity of work could indicate a larger informal sector in Pelotas. This pattern could be related to the increasing flexibility of the markets since 1989 (date of Brazilian data) and 1998 (date of the Pelotas study), and the economic situation of the city, as well as the inclusion of informal jobs generally not covered by the official statistics.

The fact that Pelotas had a lower prevalence of child labor and lower intensity of work than Urban Brazil probably means that there are areas of the country were the child economic exploitation is even worst than in Pelotas. However, the situation in Pelotas deviates from what is established by law. The work of very young children, work in hazardous activities, in conditions that could be harmful to the health or development, in conditions that could disturb school attendance or school performance and work in illegal situations are serious problems in the city.

By the Brazilian law no one younger than 14 years old can work. [4] Thus, 30% of the workers in Pelotas did not reach minimum working age and 51% had their first job when they were younger than 14 years old.

Attendance in school is mandatory from 7 to 14 years old. In Pelotas attendance in school for children older than 7 years old was high (95%), but was lower for the working children (87.7%). Work seemed to affect school attendance in Pelotas, since the prevalence of attendance in school was lower for workers than for the general population studied. But since most of the workers combined work and school, and 30% worked full-time, children were exposed to an overload that could affect negatively both children's health and their school performance. [13]

The size of the informal sector is staggering, even when it was considered just the workers that were employees. Although, the majority of self-employed workers, those that helped with family work, and all unpaid workers were not legally registered as workers as well. A high proportion work for their parents, but informal work also encompasses those that work for a non-related boss or other family members. This aspect makes it difficult to control and inspect children's work situations.

The Brazilian Federal Constitution and the Statute of Children and Adolescent establish that it is forbidden for children younger than 18 years to work in activities at night (10 PM to 5 AM), and to work in dangerous conditions, in arduous or in unhealthy jobs. Moreover, the time expended in the work activity should permit attendance in school and the employer is obliged to allow the necessary time for school attendance. [4]

Bellow we discuss the characteristics of child labor in each type of work in order to evaluate its appropriateness for younger than 18 years old. Once we don't have the information on night work from 10 PM to 5 AM to check the agreement with the law we will use the available information, the ones working at least 10 hours a week between 6 PM to 7 AM, as an approach.

Both males and females worked mainly in services. Non-domestic services are not considered a very hazardous activity, particularly taking into account that this activity is among the ones that mostly offered part-time jobs (table 4) with low prevalence of night work. It also had the highest attendance to the school, was among the ones better paid (table 5) and despite the high prevalence of non-registered workers, which was generalized, was the activity that mostly registered the workers.

Very little is known about the impact of domestic services on health and education. But it is known that the hazards vary a lot according type of cultures and places and the attitude of the employer largely determines the child's level of exploitation. This type of work enlists mainly females. The occupational hazards are largely related with the long hours and with the employer relationship that could result in more physical, mental and sexual abuse than with the work itself. But there are hazards

related to cooking, boiling water, chopping vegetables, using chemical fluids and carrying heavy items. [14], [15], [16], [17], [18]

In Pelotas females were 3 times more likely to be in domestic workers than males. Domestic work was among the activities that more frequently required full-time work (table 3), it was one of the worst paid types of job (table 5) and it was in an intermediary situation in relation to attendance in school. However, frequently considered an activity of the informal sector, in Pelotas this activity appeared in third place among the activities that more registered the workers.

Retail activity seems to be a safe type of work but some tasks can be very hazardous. In the United States this sector employs half of the workers between 14 and 17 years old accounting for half of the non-fatal injuries and 20% of the fatal injuries in these workers age-group. The long hours and the night work use to be additional hazards in this type of work. [13], [16]

In Pelotas this activity had an intermediary intensity in terms of number of hours (table 4) and is among the activities that mostly require night work. The children were working mainly for their parents (table 3). The average salary was low (table 5) due to the high proportion of payment by other things except money and the number of non-registered workers was a bit higher than the average. The attendance in school was also among the highest ones.

Construction and manufacturing, two male activities, are usually considered very hazardous. Construction is an activity known predominantly by its high risk of accident, particularly fatal accidents and the exposure to silica, asbestos, harmful dusts and

heavy loads. Manufacturing has hazards that are specific to the production process and hazards resultant from the lack of care with the work environment. [13, 16, 19]

In Pelotas, construction work was mainly a full-time job (table 4), and these children had the highest prevalence of non-registered workers and a lower prevalence of attendance in school. Most of these workers worked for their parents (table 3), but in this case, the majority of the workers were paid by money exclusively. This work ranked third place in terms of average salary (table 5).

In the manufacturing sector in Pelotas, the main jobs were home-based food industries. These children worked long hours, but they were among the group that had the highest rates of attendance in the school and higher average salary (table 5). They worked mainly for their parents (table 3) and the prevalence of non-registered workers was a bit higher than the average.

The marginal activities that the children were enrolled in Pelotas were watching and washing cars. These jobs performed at street carry a lot of hazards from the risk of traffic accidents to aspects related to the street violence such as disputes, and lure to drug traffic or other illegal activities. [17] In the Pelotas study this activity was mainly part-time (table 4) but had the highest prevalence of evening/night work. The workers in marginal activities had the lower prevalence of attendance in school. Typically from the informal sector none of the children were registered workers and they had the lower average salary among all types of work (table 5).

Therefore, construction and marginal activities as well as some tasks in the manufacturing and retail sector seem inappropriate for children younger than 18 years. Although, when considering policies to combat harmful child labor it is important to

consider that most of the hazardous activities in Pelotas (construction, manufacturing and retail) were frequently performed for parents. Moreover construction and manufacturing were among the highest average salaries. Thus, these types of job have been an important family economic strategy to increase their income and to make feasible their small business. Other relevant aspect is that when the children are working on family business, this type of work, in many cases, is an informal preparation for their adult job. Then, polices addressing the support for family business (subsidized loans) could relieve the need to use the child labor work force, moreover formal apprenticeship that really prepare the children to give continuity and improve the family business could make the difference on the opportunities of the future generation.

More analyses need to be done to understand the impact of the domestic services on the health and development of the children and to establish efficient strategies to combat the harmful aspects of this job. But it is already possible to say that the long hours and non-attendance in school need to be avoided, particularly for the very young. The marginal activities are very hazardous, frequently an unsupervised type of job, but probably an important source of income for the very poor families. Thus, alternatives other than child labor need to be found to complement the family income.

One of the alternatives could be to give scholarship or other forms of incentives that can generate income for the family once the children keep attending the school and stop working. [15] This is a policy that has been successfully applied in some cities in Brazil. This policy needs to be articulated with a wide access to the public school and strong efforts to improve the schools quality.

Furthermore, most of the parents want to do in their children best interest but sometimes they are not aware about the risks of child labor and make uninformed decisions. So, it is important to aware the parents, the boss and the children themselves about the hazards at work and the impact the work could have on health and education, as well as, about the legislation. [15]

This study showed that the majority of the child labor in the city is against the law and very concentrated in the informal market. The law enforcement could be an important strategy to combat the harmful child labor. Although, previous initiatives to combat child labor in other parts of the world lead to a migration of workers from a hazardous job to others even more hazardous, worst paid and more informal jobs. So, this kind of effect need to be avoided and all polices need to be carefully monitored. [9] Long-term polices are also important to reduce child labor as strategies to relive the poverty, to decrease the levels of adult unemployment and to improve the adult income. [20]

As for the validity of this study, it is important to point out that the cross-sectional design is appropriate for the description of the child labor characteristics. The size of this study has been planned to evaluate association between characteristics of child labor and health, thus it is sufficient for this description. There is little information on missing data, but the prevalence of missing data is very low and should not have biased this description.

Another source of bias could be the misclassification of exposure. Despite the efforts to capture the unpaid and the informal work some activities were not considered as work by the children and therefore were not reported, others did not fit clearly in the

work concept (e.g. bagging). These marginal activities seem to be particularly underestimated in this study. The interviews were performed in the households and although we have studied very poor neighborhoods, the workers in marginal activities probably live on the street and in more irregular areas, like under bridges or in tunnels. Moreover, some of the children could be ashamed to report that they performed some types of activities as, for example, scavenging and rag picking. Furthermore, this study did not intend to cover illegal child activities, such as child prostitution or drug trafficking.

This paper detailed the characteristics of child labor in Pelotas contributing to our understanding where children work and what conditions. Further analyses will be performed to detail the impact of child labor on health (musculoskeletal problems, injuries, respiratory problems and child behavior) and education.

BIBILIOGRAPHY

1. International Labor Organization. Child Labor: How the challenge is being met. *International Labor Review*. 1997;136(2):233-257.

2. Forastieri V. *Children at Work: Health and Safety Risks*. Geneva: International Labour Office; 1997.

3. Parker D. Child Labor: the impact of economic exploitation on the health and welfare of children. *Minnesota Medicine*. 1997;80(7):10-13-52-55.

4. Cruz Neto O, Moreira MR. Child and adolescent labor: factors, legal aspects, and social repercussions [In Process Citation]. *Cad Saude Publica*. 1998;14(2):437-41.

5. Fausto A, Cervini R. *O Trabalho e a Rua: Crianças e adolescentes no Brasil urbano dos anos 80*. São Paulo, SP: Cortez Editora; 1996.

6. Graitcer PI, Lerer LB. Child Labor and Health: Quantifying the global health impacts of child labor. Washington, DC: The World Bank; 1998.

7. Kleinbaum DG, Kupper LL, Morgenstern H. *Epidemiologic Research: Principles and Quantitative Methods*. New York: Wiley, John & Sons, Incorporated; 1982.

8. Rothman KJ, Greenland S. *Modern Epidemiology, 2nd Edition*. Philadelphia: Lippincott-Raven Publishers; 1998.

9. Instituto Brasileiro de Geografia e Estatística. Censo demográfico 1991: resultados preliminares. Rio de Janeiro: IBGE; 1992.

10. SPSS for Windows. Chicago, Illinois: SPSS Inc.; 1997.

11. Jeffrey A. Dean, Denis Coulombier, Donald C. Smith, Karl A. Brendel, Thomas G. Arner, Dean AG. Epi Info, Version 6: A Word-Processing, Database, and Statistics Program for Public Health on IBM-compatible Microcomputers. Atlanta, Georgia: The Division of Surveillance and Epidemiology Epidemiology Program Office Centers for Disease Control and Prevention (CDC); 1995.

12. Council for International Organization of Medical Sciences/ World Health Organization. *International Ethical Guidelines for Biomedical Research Involving Human Subjects*. Geneva: CIOMS/WHO; 1993.

13. Committee on the Health and Safety Implications of Child Labor. *Protecting Youth at Work: Health, Safety, and Development of Working Children and Adolescents in the United States*: Washington, DC; 1998.

14. UNICEF. Child Domestic Work. *Innocenti Digest*. 1999;5:20.

15. Bureau of International Labor Affairs. *By the Sweat and Toil of Children, Vol. 5: Efforts to Eliminate Child Labor*. Washington, DC: U.S. Department of Labor; 1998.

16. Fassa AG, Facchini LA, Dall'agnol MM, Christiani DC. Child labor and health: problems and perspectives. *Int J Occup Environ Health*. 2000;6(1):55-62.

17. UNICEF. *The State of the World's Children 1997*. Oxford: Oxford University Press; 1997.

18. Black M. *Child Domestic Workers: A Handbook for Research and Action*: Anti-Slavery International; 1997.

19. Bequele A, Myers WE. *First Things First in Child Labour: Eliminating work detrimental to children*. Geneva: International Labour Office; 1995.

20. Fyfe A, Jankanish M. *Trade Unions and Child Labor*. Geneva: International Labour Office; 1996.

Table 1: Prevalence of workers by age and gender (n=4924). Pelotas, RS, Brazil, 1998.

Age(years old)	Gender	n	% of workers
6-9	Male	860	2.4
	Female	792	.5
	Total	1655	1.5
10-13	Male	860	10
	Female	800	4.0
	Total	1660	7.1
14-17	Male	806	28.8
	Female	803	12.6
	Total	1609	20.7

Table 2. Distribution of child labor among the types of work according gender (n=476). Pelotas, RS, Brazil, 1998.

Type of work	Male (n=339) %	Female (n=137) %	Total (n=476) %	RR (CI 95%)
Non-domestic services	27.6	15.6	24.2	1.77 (1.1-2.7)
Domestic services	13.1	38.5	20.3	2.9 (2.1-4.2)
Retail	30.9	42.2	34.1	1.37 (1.1-1.8)
Construction	17.2	1.5	12.7	11.62 (2.9-46.9)
Manufacturing	6.2	0.7	4.7	8.41 (1.1-61.9)
Marginal activities	3.0	1.5	2.5	2.0 (0.4-9.0)
Agriculture	2.1	-	1.5	-
Total	100	100	100	

- The relative risks are in relation to the gender with higher prevalence
- RR - relative risk
- CI 95% - 95% Confidence Interval

Table 3. Type of employer according type of work (n=396). Pelotas, RS, Brazil, 1998*

Type of Employer	n	Parent	Other family member	Boss
Type of work				
Non-domestic services	93	22.6	9.7	67.7
Domestic services	68	2.9	32.4	64.7
Retail	141	54.6	11.3	34.0
Construction	50	52.0	18.0	30.0
Manufacturing	18	55.6	11.1	33.3
Marginal activities	6	50.0	-	50.0
Agriculture	5	20.0	20.0	60.0
Total	381**	36.7	15.5	45.8

*Among the workers that were employees and that helped with family work

** Missing cases = 15

Table 4. Number of hours worked in each type of work (n=476). Pelotas, RS, Brazil, 1998.

Intensity of work (hours/week)	n	20 or less %	21 to 39 %	40 or more %	Missing %
Type of work					
Non-domestic services	114	36.8	24.6	21.9	16.7
Domestic services	96	26.0	13.5	36.5	24.0
Retail	161	28.0	20.5	33.5	18.0
Construction	60	26.7	18.3	36.7	18.3
Manufacturing	22	27.3	22.7	36.4	13.6
Marginal activities	12	41.7	16.7	25.0	16.7
Agriculture	7	28.6	28.6	42.9	
Total	472*	29.9	19.9	31.8	18.4

* Missing cases = 4

Table 5. Average children wage in each type of work (n=476). Pelotas, RS, Brazil, 1998.

Children Wage in US$	n	Mean	S.D.
Type of work			
Non-domestic services	107	77.45	64.95
Domestic services	92	50.31	93.37
Retail	152	54.79	66.97
Construction	53	71.70	62.38
Manufacturing	20	84.00	73.92
Marginal activities	12	18.33	13.08
Agriculture	7	36.67	27.48
Total	443*	61.40	72.42

S.D. standard deviation

* Missing cases = 33

Table 6. Comparisons among Urban Brazil and the Pelotas study. Pelotas, RS, Brazil 1998.

	Pelotas Study	Urban Brazil
Prevalence of child labor		*
10 to 14 years old	8.3	12.6
15 to 17 years old	23.3	46.6
10 to 17 years-old	13.8	24.8
Female Participation		**
10 to 14 years old	27.7	35.1
15 to 17 years old	30.6	38.2
Attendance in school (10-17 years-old)		**
Non-workers	94.8	87.4
Workers	87.1	51.5
Total	93.7	86.7
Job Status (10 to 17 years-old)		**
Registered employee	18.0	25.5
Non-registered employee	62.1	59.7
Self-employed	16.0	7.1
Unpaid	3.9	7.7

Continuing Table 6

	Pelotas Study	Urban Brazil
Type of work (10 to 17 years-old)		**
Services	47.2	45.9
Retail	33.9	17.4
Manufacturing	4.7	18.5
Construction	12.9	6.8
Agriculture	1.3	10.4
Percent of children that worked 40 hours per week or more		*
10 to 14 years old	27.0	53.7
15 to 17 years old	45.7	79.1
10 to 17 years-old	39.3	70.7

* FIBGE/PNAD 1989

** FIBGE/PNAD 1988

ACKNOWLEDGMENTS

This study was supported by the following Brazilian agencies: CAPES, Ministry of Education, Brazil; CNPq, Ministry of Science and Technology and Rede Unitrabalho. This study was also supported by the Fulbright Scholars Program; the Pan-American Health Organization (PAHO); the Takemi Program in International Health through the Merck Company Foundation and the Harvard Program in Occupational Safety and Health through the NIH ESO 002 and the Liberty Mutual, of the Harvard School of Public Health, USA.

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Artigo 3

Child Labor and Musculoskeletal Disorders: The Pelotas (Brazil) Epidemiologic Survey

Será submetido para publicação no

American Journal of Industrial Medicine

Pelotas, julho de 2000

Title: Child labor and musculoskeletal disorders: The Pelotas (Brazil) epidemiological survey

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Running Head: Child labor and musculoskeletal disorders

ABSTRACT

Background: Although studies presented a high prevalence of musculoskeletal disorder among children, the association of this morbidity with work was not evaluated. This study describes the prevalence of musculoskeletal pain in several sites and its association with work adjusting for confounders and mediators.

Methods: A population-based cross-sectional study interviewed 3,269 children from 10 to 17 years old in the low-income areas of Pelotas – Brazil.

Results: The prevalence of pain in the neck, knee, wrist or hands and upper back was higher than 15%. Workers in manufacture and in domestic services presented a higher risk of pain in any site and particularly in the back, in the year before the interview when compared with non-workers (odds ratios higher than 1.5).

Conclusions: Our results suggest that strategies to prevent musculoskeletal disorders in child workers should be developed; but further studies are necessary to deepen the understanding about the association under study.

Key Words: child labor, musculoskeletal disorders, back pain, logistic regression, prevalence

INTRODUCTION

The exploitation of child labor is a problem worldwide with more than 250 million children working between 10 and 14 years old [Parker, 1997]. The developing countries concentrate 95% of the working children and a country like Brazil has 9,3 million children between 10 and 17 years in the labor market [OMS, 1987]; [Cruz Neto et al., 1998].

Despite the limitations, there is some information about the occupational characteristics of working children, but a lot of controversy exists in the attempt to define what work is appropriate for children. Part of this controversy is related to a different understanding about what is a child, what is the children's role in society and what is work. On the other hand, this controversy has also to do with the lack of information about the work impact on children and teens health and education.

It is known that children and teens are exposed to the same hazards as adults when performing the same activity. But they differ from adults in their anatomical, physiological, and psychological characteristics, thus they could be more susceptible to occupational hazards at their workplace than adult workers are, even when exposed to the same hazards [ILO, 1998]; [UNICEF, 1997]; [Forastieri, 1997]; [Fassa et al., 2000b]; [Asmus et al., 1996].

The musculoskeletal disorders are one of the major health problems in Western Societies with a prevalence of about 30% among people aged 25 to 74 years old [Liira et al., 1996]. The lifetime occurrence of low back pain is estimated at 80% [Ebrall, 1994]. Frequently, this problem in adults is related to work, particularly with the activities that involve repetition, vibration, lifting, forceful movement, awkward posture, heavy

physical work and static work posture [National Institute of Occupational Safety and Health, 1997]; [Liira et al., 1996]; [Roncarati et al., 1988].

According Parker et al. [1994] sprain and strains are the most frequent type of injury among teens and low and mid back injuries represent 73% of the work-related strains that cause adolescents to miss work or school. The sample prevalence of low back pain in a school children study were 57% [Ebrall, 1994]. The risk factors for musculoskeletal disorder most frequently evaluated were age, gender, smoking, practice of sport and sedentary activities [Balagué et al., 1988]. Although children and adolescents are commonly employed in activities where they are exposed to workloads associated with musculoskeletal disorders, little research has been carried out on these workers age groups and on the impact of child labor on this type of morbidity [Olsen et al., 1992].

There is great concern that due to characteristics of children and teens development they are in greater risk of musculoskeletal disorders than adults are. Between the ages of 10 to 20 years an individual acquires 15 to 20% of his/her height. About half of that growth occurs during a two-year period that includes the phase of most rapid growth, which girls reach at an average of 12 years old and boys reach at an average of 14 years of age [Committee on the Health and Safety Implications of Child Labor, 1998]. During this period teens are at particularly high risk of injuries to ligaments and to bone growth plates. [Committee on the Health and Safety Implications of Child Labor, 1998]; [Fassa et al., 2000b]. Ergonomic factors could also contribute to the increased risk of musculoskeletal disorders among children and teens because of mismatches between their size and the dimension of equipment or machinery designed

for adults [Committee on the Health and Safety Implications of Child Labor, 1998]; [Fassa et al., 2000b].

Studies have described that injuries of growth plates in teens could result in various osteochondroses, some of which can have long-term orthopedic consequences, including limbs of unequal length [Committee on the Health and Safety Implications of Child Labor, 1998]. Furthermore, prior back problems are one of the strongest predictors of new back injuries [Brooks et al., 1996]. Thus, another reason for concern is the long- term consequences of a precocious musculoskeletal disorder.

The Pelotas survey describes the characteristics of child labor, health and education in the urban low-income areas and evaluates the associations between child labor and injuries, musculoskeletal problems, respiratory and behavioral problems.

The objective of this paper is to describe the prevalence of musculoskeletal disorders in children and teens and to investigate the association of these disorders with types of work activities adjusting for age; gender; smoking; practice of sports; use of the computer, video-game or watching VCR; domestic activities, taking care of other children, and taking care of sick or elderly family member.

MATERIALS AND METHODS

In this paper we present methodological aspects related to the description of the prevalence of musculoskeletal disorders in children and teens and their association with work activities. The impact of child labor on other health aspects and on education will be published in further papers. However, we have included all the characteristics needed for the reliability of the study.

Study Design

Through a population-based cross-sectional study we interviewed 4,924 children between 6 an 17 years old in the low-income areas of Pelotas-Brazil. We estimated 7.6% of missing cases [Rothman et al., 1998]; [Kleinbaum et al., 1982]. As the prevalence of workers in the youngest age group was very low, in this paper we present analyses of 3,269 children between 10 and 17 years of age.

To calculate the sample size we used the following parameters: a confidence level of 95%, a statistical power of 80%, an exposure prevalence of 10%, an expected frequency of disease in unexposed group of 5% (disease of lower prevalence in the study low back pain in the year before the interview) and a relative risk of 1.8. Adding to the estimated sample 15% for control of potential confounding factors and 10% for missing cases we established a sample size of 4,390 subjects.

The focus on children between 10 and 17 years old reducing the sample size does not affected the description of the prevalence of musculoskeletal disorders. On the other hand, the smaller sample size added to the need to evaluate different work activities breaking up the exposed group demanded that we concentrate the logistic regression in outcomes of high prevalence in order to maintain the same confidence level and statistical power [Rothman et al., 1998]; [Kleinbaum et al., 1982].

Sample Selection

The urban area of Pelotas has 300,000 inhabitants and 70 low-income areas with an average of 3.5 people per household and a proportion of 23% between 6 and 17 years old [Instituto Brasileiro de Geografia e Estatística, 1992]. To find the established

sample we randomly selected 22 neighborhoods interviewing all children between 6 and 17 year old in each household of those areas.

The low-income neighborhoods are the areas established by the population census where less than 1,5% of household heads earns more than 2,000 dollars monthly (US$ 100 = one Brazilian minimum salary) [Instituto Brasileiro de Geografia e Estatística, 1992].

Students of medicine and nursing (24 interviewers), specially trained to collect this information applied the interviews, between January and June of 1998. The subjects (mother or her substitute and child) gave an informed consent to participate in the study, the confidentiality of the information was guaranteed as well as the right to refuse to participate. The mother or her substitute was interviewed about general characteristics of the family while the children answered questions about their work, health and education.

A supervisor reviewed all questionnaires identifying missing data and imprecise or inconsistent answers as a way of continuously train the research staff and standardizes the data collection. Moreover, 5% of the questionnaires were partially redone to check the data quality.

The Exposures

The work of children and teens was defined as activities performed by persons between 6 and 17 years of age that contribute to the production of a marketable product, good, or service, including activities done without pay. Although, household work performed in the parent's home can be considered an economic activity in some circumstances, this particular type of work was not analyzed in this paper.

The types of work currently performed in the moment of the interview were categorized in non-domestic services, domestic services, retail, construction, manufacture and others. The children also gave information about type of job, intensity of work, their participation in the informal market, type of payment and income.

Awkward posture, monotonous work, repetition, noise and heavy physical work were also evaluated as mediators in the association between type of work activities and musculoskeletal disorders

The Outcomes

The general standardized Nordic questionnaire for analysis of musculoskeletal symptoms proposed by Kuorinka et al. [1987] was used to characterize the musculoskeletal disorders identifying pain in the year before the interview in the following sites: neck, shoulders, elbows, wrist/hands, upper back, lower back, thighs, knees and ankles. We asked the ones who complained of pain wether this pain prevented from carrying out any activity. In order to obtain more specific details about the site of pain, other than the verbal question we also presented a graphic picture where the different sites of the body were shown in different colors.

The different sites were used for the descriptive analysis, while for the logistic regression we defined two main outcomes: pain in any site in the year before the interview, grouping those who answered yes for any of the sites in study; and back pain in the year before the interview, grouping those who gave positive answers for pain in the neck, shoulders, upper back or lower back.

The Confounding Factors

The identification of the confounding factors took into account the bibliographic review and the statistical association. We considered potential confounding factors the examined variables associated with the exposure and the outcome with a $p<0.2$.

We evaluated individual factors associated with musculoskeletal disorders as age, gender and smoking. We also examined non-occupational activities that could be confounding the association between work activities and musculoskeletal disorders as school attendance and the habit of spending their leisure time practicing sports; using the computer, playing video-game or watching VCR.

Moreover we analyzed activities performed at home that could be related with musculoskeletal problems such as domestic activities, taking care of other children, and taking care of sick or elderly family member. The domestic activities were categorized as none, for those who do not realize any of the following activities; light for those who tidy up the house, carry things or are sent for small activities; moderate for those who help with cooking, dusting, shopping, sweeping out the house, washing dishes, or fixing things; at least one of the heavy activities for those who cook, clean the house, wash clothes or hang clothes to dry and heavy for those who do all heavy activities.

The Analysis

The descriptive analyses examined the prevalence of child labor characteristics and musculoskeletal disorders. The logistic regression evaluated the association of work activities with pain in any site in the year before the interview, and with back pain in the year before the interview, adjusted for confounding factors. The analyses were

carried out at the software SPSS, and complemented at the Stata in order to perform the regression diagnosis (Figure I).

RESULTS

We studied 3,269 children between 10 and 17 years old with an average age of 13 years old (s.d. (Standard Deviation) = 2.25). Half of them were males, 76% were white, 93% were attending school and 50% were from families with a family income of 4 or less minimum salaries per month (US$ 400.00).

Of the population studied 13.9% were currently working and 15.7% were not currently working but had already worked previously. Among the 451 children that were currently working 32.2% were in retail, 24.1% in domestic services, 22.5% in non-domestic services, 13.6% in construction, 4.1% in manufacture, 3.7% in other activities. The child workers had an average monthly income of 0.75 minimum salary (US$ 74.00), 85% were not registered workers being in the informal sector and 39.3% worked 40 hours per week or more. The attendance at school was 87.1% and among the child workers between 14 and 17 years old 33.5% were studying at night.

More than 60% of the children reported musculoskeletal pain in any site in the year before the interview and 41.5% of them said the pain brought difficulties to perform some activity (Table I). Back pain in the year before the interview was mentioned by 41.8% of the children and 32.8% of them said the pain brought difficulties to perform some activity (Table I). Pain in the neck, knee, wrist or hands and upper back in the year before the interview made up more than 15% of the sample (Table I). The

association of the outcome with age and gender varies a lot according to the sites of pain.

The workers in manufacture had the highest prevalence of pain in the year before the interview in the neck (42.9%), shoulder (19%), wrist or hands (42.9%), upper back (23.8%) and thigh (19%). Construction workers had the highest prevalence of pain in the elbow (6.9%) and low back (17.2%). The workers in domestic service had the highest prevalence of pain in the leg (18.9%) and in the knee (25.6) and those in non-domestic services had the highest prevalence of pain in ankles and feet (13.6%) (Table I).

There was no significant difference in the prevalence of musculoskeletal pain in any site in the year before the interview or in the prevalence of back pain in the year before the interview among workers when compared to non-workers. Compared to non-workers, the ex-workers presented an increased risk of musculoskeletal pain in any site in the year before the interview (40% in the crude analyses and 28% when adjusted for age).

Musculoskeletal pain in any site in the year before the interview affected 90.5% of the workers in manufacture followed by those in domestic services (78.9%), while back pain affected 71.4% of the workers in manufacture and 54.4% of the workers in domestic services (Table I). Gender and age rates vary greatly according type of work.

Considering the workloads that could be related to musculoskeletal disorders, noise, awkward posture, monotonous work, repetition and heavy physical work, we identified that among the workers the most frequent workload was repetition (40.3%) with more than half of the workers in manufacture and construction exposed. The

workers on manufacture presented the highest prevalence of exposure to all workloads excepting heavy physical work which is more prevalent in construction (32%) (Table II) The workloads had 10% of missing data reaching 24% among workers in domestic services and 13% among workers in construction (Table II).

Musculoskeletal pain in any site in the year before the interview increased with age but was not associated with gender or smoking (Table III). Children who practice sports or use computer, play video game or watch VCR in their leisure time presented 20% more risk of musculoskeletal pain in any site in the year before the interview (Table III). The children that attended school had a risk of 1.3 for this musculoskeletal disorder when compared to those who do not attended school (Table III). Domestic activities were related to musculoskeletal pain in any site in the year before the interview with linear tendency ($p=0.0001$), as heavier the domestic activity higher the risk (Table III). To take care of other children and to take care of sick or elderly family member was also associated with the outcome (odds ratios of 1.18 and 1.41 respectively) (Table III). The practice of sports and taking care of sick and elderly family members were not associated with the type of work activity therefore were not considered in the multivariable analyses.

More than 75% of the child workers exposed to the workloads under study reported musculoskeletal pain in any site in the year before the interview. Excepting noise all others workloads were significantly associated with the outcome presenting risks from 60 to 100% (Table IV).

In the logistic regression the workers in manufacture and domestic services presented a significant increased risk of musculoskeletal pain, in any site, in the year

before the interview when compared with non-workers (odds ratios of 4.73 and 1.89 respectively) and retail workers after adjustment for confounding factors (Table V). The adjustment for the mediators decreased the odds ratios in approximately half for construction and manufacture, 40% for non-domestic services and 30% for retail and domestic services. This decrease occurred not only taking into consideration the work activities that were risk factor for the outcome but also taking into consideration those activities that were not significantly associated with the morbidity (Table V).

The risk of back pain in the year before the interview increased with age (Table VI). The females presented 30% more back pain in the year before the interview than males, and smokers 60% more than non-smokers (Table VI). The heavier the domestic activities the higher the risk for this morbidity, presenting a linear tendency (p=0.000) (Table VI). The children who took care of other children presented a significant increased risk of back pain (OR=1.23) (Table VI). Practice of sports and use of computer, playing video game or watching VCR in their leisure time were not significantly associated with back pain in the year before the interview, as well as, school attendance and taking care of sick or elderly family member (Table VI).

Around half of the children exposed to repetition and heavy physical work and more than 60% of those exposed to monotonous work, awkward posture and noise presented back pain in the year before the interview (Table VII). Excepting repetition, the workloads were significantly associated with back pain in the year before the interview (Table VII). The children exposed to noise, awkward posture and monotonous work had more than twice the risk for this morbidity than the non-exposed (Table VII).

After adjustment for confounders, the manufacturing workers on had three times more risk of back pain in the year before the interview than non-workers. This increased risk also appeared when comparing with the workers in retail, but the association was significant just with the former, being borderline with the last one (Table VIII). The workers in domestic service presented an increased risk of 50% when compared with non-workers but the association was not significant (Table VIII). The adjustment for the mediators decreased the odds ratios in 40% for manufacture, 30% for non-domestic workers, 25% for workers in retail and domestic, and 8% for construction workers (Table VIII). This decrease occurred not only for the activities that presented an increased risk of back pain in the year before the interview, but also for all work activities.

DISCUSSION

The condition of being a child worker was not associated with an increased risk of musculoskeletal disorders. It was the type of work and the workloads to which the child workers were exposed that were associated with this morbidity. The Pelotas epidemiological survey presented the prevalence of musculoskeletal disorders in several sites in children between 10 and 17 years old and found an increased risk of musculoskeletal pain, in any site in the year before the interview among workers in manufacture and domestic services when compared to non-workers and those in retail. We also found an increased risk of back pain in the year before the interview among workers in manufacture when compared with non-workers. Those in domestic services presented the same trend but the association was not significant.

There are several difficulties to determine the prevalence of musculoskeletal disorders and to compare the findings of different studies. The definition of the disorder is not standardized, there is a subjective interpretation of the definition by the respondents of varying age and lifetime experience and the reported prevalence rates would also be affected by the varying time frames [Ebrall, 1994]. Moreover, most part of the available studies were performed in the industrialized countries where the general conditions of life and the insertion of children and teens into the labor market is different form that in developing countries.

In adults, despite the controversy about the relative importance of the individual and occupational factors on musculoskeletal problems, there is a consensus that its magnitude and its cost justify serious efforts to better understand the etiology [National Institute of Occupational Safety and Health, 1997]. In the Pelotas study this morbidity presents high prevalence rates for children and adolescents, frequently resulting in some level of limitation in their daily activities.

We were not able to find in the bibliography papers reporting the prevalence of musculoskeletal problems in all the different sites we studied. Most of the available bibliography is on adolescent low back pain. Many studies report the lifetime prevalence and the point prevalence and some of them report the prevalence in the past year, for different definitions of low back pain and different age ranges.

Several studies found an adolescent low back pain lifetime prevalence higher than 30%, confirming its importance as a public health problem [Balagué et al., 1988]; [Olsen et al., 1992]; [Ebrall, 1994]. The Pelotas study found a prevalence of low back pain in the year before the interview of 13.1% (Table I). Belagué et al. (1988) found a

lifetime back pain prevalence (includes cervical, lumbar and thoracic sites) of 46% while in the Pelotas study 41.8% of the children had back pain in the year before the interview (Table I). In the Belagué et al. [1988] study, the lumbar location was the most frequent site of back pain followed by thoracic and cervical sites while in the Pelotas study the most frequent locations were cervical followed by thoracic and lumbar (Table I).

The several age-ranges and time frames used in the studies explain in part the differences in the reported prevalence. Moreover, the differences among developed and developing countries regarding the frequency, type and intensity of sport activities and sedentary activities; and the frequency of child labor and types of work and exposures could also play a role in the different findings.

We were not able to find studies examining the association between child labor and musculoskeletal disorders. There is bibliography available on this subject targeting adults but, despite the magnitude and the potential long-term consequences of this morbidity in adolescents, the few papers on adolescent musculoskeletal disorders do not evaluate the impact of their work on this aspect of health [Olsen et al., 1992].

Manufacturing workers showed the highest prevalence of pain in most part of the sites as well as the highest prevalence of exposure to the studied workloads (Table I and Table II). They also presented an increased risk of musculoskeletal disorder in any site and back pain in the year before the interview after adjustment for confounding factors when compared to non-workers and workers in retail (Table V and Table VIII). In our study the main jobs in manufacture were carpenters, industrial workers (general), silk screen workers, baker and food manufacture workers. In many studies manufacture does not appear as a high risk occupation for musculoskeletal disorders, but manual

workers and blue collar workers are generally among the higher risk groups [Rossignol et al., 1988]; [Liira et al., 1996]. Moreover, there is strong evidence in the bibliography of causal relationship between the workloads to which the child workers were exposed and pain in several of the studied sites to which have [National Institute of Occupational Safety and Health, 1997].

Although domestic services were not among the occupations that present higher prevalence of workloads in the Pelotas study, it appears in second place in terms of prevalence of pain in several sites. This work activity also presented an increased risk of musculoskeletal disorder in any site in the year before the interview after adjustment for confounding factors when compared to non-workers and workers in retail (Table I, Table II and Table V). The main jobs performed were yard cleaners, nanny and maid.

Domestic Services is one of the most common urban child work activity in developing countries and employs a large number of girls [Bureau of International Labor Affairs, 1998]; [Fassa et al., 2000b]. In Brazil 8% of the child workers between the ages of 10 to 14 years old were employed in this work [Bureau of International Labor Affairs, 1998]. Most of what we know about the hazards in domestic services come from the description of working conditions. Some chores involve exposure to workloads and frequently the children work for long hours and do not attend the school [Fassa et al., 2000a]; [UNICEF, 1999]; [UNICEF, 1997].

Thus, it is intriguing that the prevalence of workloads reported in the study was quite low. This might be explained by the high prevalence of workloads' missing data among workers in domestic service. Also the diversity of chores in this activity could be another reason for this low prevalence. Different form other types of work where the

workloads are present during the whole working day, in this activity the workloads can appear while performing one task and are not present in another. For example, a maid could be exposed to heavy physical work and awkward posture while washing and hanging out clothes, and not be exposed while cooking. The other aspect is that these child workers might not recognize the workloads due to the similarity with the work they perform in their own home. It is interesting to note that, the domestic activities performed in their own home were also associated with musculoskeletal disorders in the Pelotas study.

Workers in construction did not present a significant association with musculoskeletal disorder in any site and back pain in the year before the interview after adjustment for confounding factors when compared with non-workers (Table V and Table VIII). But these workers reported the highest prevalence of heavy physical work and the second highest prevalence of repetition and awkward posture (Table II). These workers also presented the highest prevalence of low back pain among all types of studied activities (Table I).

Studies on adults showed that construction is a high-risk activity for back problems. Rossignol et al. [1988] found that construction workers had the greatest length of absence for back problems while other study found the highest prevalence of long term back problems among the workers in this activity [Liira et al., 1996]. In the Pelotas survey the low statistical power due to the small number of workers in this activity could justify the lack of significant association. With this low number of exposed workers the study would be able to find significant associations just for very large odds ratios. Moreover, the healthy worker effect might have underestimated the risk.

Excepting noise that was not significantly associated with musculoskeletal disorder in any site in the year before the interview and repetition that was not significantly associated with back pain in the year before the interview, the other workloads, awkward posture, heavy physical work and monotonous work were associated with the studied outcomes (Table IV and Table VII). There is evidence that the physical workloads repetition, force, posture and vibration present a causal relationship with neck and shoulder, hand/wrist and back pain [National Institute of Occupational Safety and Health, 1997]. The causal relationship between psychosocial factors and work-related musculoskeletal disorders is less consistent but studies suggest that monotonous work, limited job control, low job clarity, and low social support are associated with various musculoskeletal disorders [National Institute of Occupational Safety and Health, 1997].

The studied workloads behave as important mediators in the association between work activities and the outcomes presenting a great decrease in the odds ratios adjusted for confounders when comparing with the odds ratios adjusted for confounders and workloads (Table V and Table VIII). This decrease happened not only for the activities that presented higher risk of musculoskeletal disorders when compared with non-workers but also for all activities (Table V and Table VIII). This means that if the child workers were not exposed to the workloads they would present less musculoskeletal disorders.

Age was associated with musculoskeletal disorder in any site as also back pain in the year before the interview and was the most important confouder in the association of work activity and these outcomes (Table II and Table VI). In accordance with Pelotas'

research, studies on general population showed that the prevalence of musculoskeletal disorders increases as people enter their working years, after that the prevalence is relatively consistent and studies in adolescents found increase in the prevalence of low back pain with age. [National Institute of Occupational Safety and Health, 1997]; [Ebrall, 1994]; [Balagué et al., 1988].

Gender was significantly associated with low back pain but not with musculoskeletal disorders in any site in the year before the interview (Table II and Table VI). The association of gender and musculoskeletal disorders is controversial in the bibliography and it varies a lot according site of pain [National Institute of Occupational Safety and Health, 1997]. But studies on adolescents found a higher prevalence of low back pain among females when compared with males being in accordance with the Pelotas survey [Olsen et al., 1992]; [Balagué et al., 1988]. The higher prevalence of musculoskeletal disorders in women than in men is attributed to some physiological factors. One of them is the presence of more type one fibers in the trapezius muscle in women than men and another is the sexual dimorphism of spine and the high incidence of dysmenorrhea which sometimes is confounded with mechanical low back pain. Moreover, women have a different insertion in the labor market than men frequently enrolling in hand-intensive jobs. Thus the higher prevalence of this outcome among women can also be related with the type of work the women perform and the type of workloads to which they are exposed [National Institute of Occupational Safety and Health, 1997].

Smoking was significantly associated with back pain but not with musculoskeletal disorder in any site in the year before the interview (Table II and Table VI). Several

papers have presented evidence that a positive smoking history is associated with low back pain, sciatica or intervertebral herniated disc whereas in others, the relationship is negative [National Institute of Occupational Safety and Health, 1997]; [Balagué et al., 1988]. Several explanations for this relationship have been postulated. One hypothesis is that coughing from smoking causes back pain. Other proposed mechanisms include nicotine-induced diminished blood flow to vulnerable tissues and smoking-induced diminished mineral content of bone causing microfractures [National Institute of Occupational Safety and Health, 1997].

Practice of sports; use of computer, playing video game or watching VCR and school attendance were significantly associated with musculoskeletal disorder in any site but not with low back pain in the year before the interview (Table II and Table VI). There are evidences that sports activities may cause injuries; on the other hand the lack of physical activities may increase the susceptibility to injury, thus, its association with musculoskeletal disorders is not clear [National Institute of Occupational Safety and Health, 1997]; [Balagué et al., 1988]. School attendance could increase the risk of injury while the children are playing at school, but it also involves an amount of time sited in a static posture and sometimes carrying heavy books. The use of the leisure time with the computer, video game or VCR, gave an idea about the habit of performing sedentary activities. In the Balagué et al. [1988] study the prevalence of low back pain increased with the number of hours spent watching television.

More information about these variables would be helpful for the better understanding of the impact of sports practice, sedentary activities and school attendance on musculoskeletal disorders. Regarding school attendance it would be

important to have information on the weight of schoolbags and how the children carry them, type of transport used to travel to and from school, time spent sited at school, type and intensity of physical activities at school [Viry et al., 1999]. Regarding sedentary activities and sports practice it would be important to know the intensity and type of activities performed [Balagué et al., 1988].

Domestic activities, taking care of other children and taking care of sick or elderly family members were significantly associated with musculoskeletal disorder in any site and back pain in the year before the interview. We were not able to find other studies examining the impact of these activities on musculoskeletal disorders. But these activities involve exposures related to the studied outcome as heavy physical work and awkward posture while washing and hanging out clothes, carrying children, helping sick or elderly family members and repetitive movements in some cooking tasks.

Regarding the validity of this study, it is important to recognize that the cross-sectional design does not permit an evaluation of the directionality of associations [Rothman et al., 1998]. The exposure was evaluated in detail and the groups of work activities were established from a list of the referred jobs. The study was particularly careful to cover unpaid and temporary work once this type of activities, not considered work by the children, are frequently underestimated. However we did not evaluate the duration of employment, the mobility in and out of the labor market as well as between occupations while the outcomes refer to the year before the interview.

The limitations in the characterization of the exposure could generate a lack of precision in the exposure classification while the problems in the characterization of the exposure added to the recall period of the outcome could lead to difficulties to establish

the direction of association. However, the association between work activities and musculoskeletal disorders presents a strong biological plausibility, particularly with the workloads showing a strong mediator effect.

We used the standardized Nordic general questionnaire to avoid misclassification in the outcome. According to Kuorinka et al. [1987] the reliability tests with the test-retest method showed that the number of non-identical answers varied from 0 to 23% while the validity tests against clinical history showed that the number of non-identical answers varied between 0 and 20%. Due to the simple language of the questionnaire we do not believe that the translation has been a problem. On the other hand, the reliability and validity of the questionnaire has not been tested among children and teens or in low income areas were the level of education is different from the place where the questionnaire has been evaluated. The combination of verbal and graphic picture should have facilitated the children and teens understanding but the recall bias could be greater for children and teens than for adults, in this case the studied associations would be biased in direction to unit underestimating the effects.

The study was planed to compare workers and non-workers, thus the evaluation of different types of work activity could decrease the statistical power [Rothman et al., 1998]. However the study of outcomes with high prevalence allowed us to find significant associations. On the other hand, non-significant association between construction workers and musculoskeletal disorders when compared with non-workers could be related to the lack of statistical power.

It is possible that the study missed more worker than non-worker subjects, but the prevalence of missing subjects was very low, thus we do not expect that the study was affected by this type of selection bias.

The healthy worker effect might have underestimated the risks. The workers of more hazardous activities need to be healthier than non-workers or the workers in less hazardous activities. The higher risk of musculoskeletal disorders in ex-workers when compared to workers possibly point out for this type of effect. The comparison among different occupations while not solving the problem does minimizes it somewhat.

The anthropometrical factors, weight, height, body mass index and obesity have been identified as potential risk factors for certain musculoskeletal disorders [National Institute of Occupational Safety and Health, 1997]. These factors were not evaluated as potential confounders in the association between work activities and musculoskeletal disorders and its evaluation could add precision to the risk estimations. Moreover, the inclusion of some mediator factors, such as vibration and psychosocial factors, could contribute to a better understanding of the causality chain.

Due to the high prevalence of musculoskeletal disorders in any site and back pain in the year before the interview, the logistic regression estimated odds ratio overestimated the prevalence ratio [Hirakata, 1999]; [Rothman et al., 1998]. Among the available strategies to evaluate this overestimation we chose to repeat the multivariable analyses through the Poisson regression. Knowing that when the outcome is binary the observed variance is smaller than the estimated Poisson variance we used a robust estimation of the variance in order to correct the confidence interval width [Hirakata, 1999].

We compared the final hierarchical models examining the association between work activities and musculoskeletal pain in any site in the year before the interview after adjustment for confounders. Using non-workers as a reference group, the prevalence ratio calculated by the Poisson regression were 253% and 59% lower than the odds ratios for workers in manufacture and domestic services respectively. For other work activities the overestimation effect were between 13% and 27%. Repeating the procedure for back pain in the year before the interview we found a prevalence ratio 102% and 23% lower than the odd ratios for workers on manufacture and domestic services respectively. For other work activities the overestimation effect was around 3%.

We used the likelihood-ratio test to define the permanence of the confounders in the logistic regression equation and the Wald test in the Poisson regression. The confounding factors remained the same for both outcomes in the Poisson and logistic models. As expected, the significant associations were maintained and did not alter the interpretation of results.

As a logistic regression diagnosis, we evaluated the quality of the model adjustment, the distribution of Pearson residuals normalized and the influence measures. The model presented a good quality of adjustment with a non-significant goodness of fit test. The distribution of residuals was appropriated with more than 95% within one standard deviation. The analysis with and without the most influential points presented similar findings not changing the interpretation of the results [Kleinbaum et al., 1998].

The Pelotas' survey found a high prevalence of musculoskeletal disorders among children and teens. The study is in accordance with the available bibliography about the association of age, gender, sports activities, and sedentary activities with the morbidity studied. We also explored the role of activities performed in the childrens' own home (domestic activities, taking care of other children and taking care of sick and elderly family member) showing their association with musculoskeletal disorders and enlarging the evaluation of etiological factors.

The main contribution of the study was to demonstrate an association between child labor and musculoskeletal disorders presenting the mediator effect of workloads. Manufacturing workers and those in domestic service presented a high risk of musculoskeletal disorders when compared to non-workers and workers in retail.

The prevalence of musculoskeletal disorders and its potential long-term effects justify precocious prevention of the problem. McCauley [1990] tested a preventive program incorporating body mechanics instruction. The young workers that participated in the program performed better when using proper body mechanics at work [McCauley, 1990]. More preventive strategies need to be proposed and evaluated through intervention studies.

Moreover, further research is needed to examine the relationship between child labor and health. Developed and developing countries need studies on this matter and it is important to cover both of them in order to evaluate a wide range of occupations such as domestic services and specific jobs in manufacture and to deepen and enlarge the evaluation of the workloads.

BIBLIOGRAPHY

Asmus C, Barker A, Ruzany M, Meirelles Z. 1996. Riscos ocupacionais na infância e na adolescência: uma revisão. Jornal de Pediatria 72(4):203-208.

Balagué T, Dutoit G, Waldburger M. 1988. Law back pain in schoolchildren: an epidemiological study. Scand J Rehabil Med 10:175-9.

Brooks DR, Davis LK. 1996. Work-related injuries to Massachusetts teens, 1987-1990. Am J Ind Med 29(2):153-60.

Bureau of International Labor Affairs. 1998. By the sweat and toil of children, Vol. 5: Efforts to eliminate child labor. Washington, DC: U.S. Department of Labor. 230 p.

Committee on the Health and Safety Implications of Child Labor. 1998. Protecting youth at work: Health, safety, and development of working children and adolescents in the United States: Washington, DC. 318 p.

Cruz Neto O, Moreira MR. 1998. Child and adolescent labor: factors, legal aspects, and social repercussions [In Process Citation]. Cad Saude Publica 14(2):437-41.

Ebrall PS. 1994. The epidemiology of male adolescent low back pain in a north suburban population of Melbourne, Australia. J Manipulative Physiol Ther 17(7):447-53.

Fassa AG, Facchini LA, Dall'agnol MM, Christiani DC. 2000a. Characteristics of child labor in a city in Southern Brazil. Am J Public Health (submitted for publication).

Fassa AG, Facchini LA, Dall'agnol MM, Christiani DC. 2000b. Child labor and health: problems and perspectives. Int J Occup Environ Health 6(1):55-62.

Forastieri V. 1997. Children at work: Health and safety risks. Geneva: International Labour Office. 138 p.

Hirakata V. 1999. Alternativas de análise para um desfecho binário em estudos transversais e longitudinais [Obtenção do grau de Mestre]. Pelotas: Universidade Federal de Pelotas. 104 p.

ILO. 1998. Child labour: Targeting the intolerable. Geneva: International Labour Office.

Instituto Brasileiro de Geografia e Estatística. 1992. Censo demográfico 1991: resultados preliminares. Rio de Janeiro: IBGE.

Kleinbaum D, Kupper L, Morgenstern H. 1982. Epidemiologic research: Principles and quantitative methods. New York: Wiley, John & Sons, Incorporated. 544 p.

Kleinbaum D, Kupper L, Muller K, Nizam A. 1998. Applied regression analysis and other multivariable methods. Pacific Grove, CA: Duxbury Press. 798 p.

Liira JP, Shannon HS, Chambers LW, Haines TA. 1996. Long-term back problems and physical work exposures in the 1990 Ontario Health Survey. Am J Public Health 86(3):382-7.

McCauley M. 1990. The effect of body mechanics instruction on work performance among young workers. Am J Occup Ther 44(5):402-7.

National Institute of Occupational Safety and Health. 1997. Musculoskeletal disorders and workplace factors: A critical review of epidemiologic evidence for work-related musculoskeletal disorders of the neck, upper extremity and low back. Cincinnati, OH: National Institute for Occupational Safety and Health.

Olsen TL, Anderson RL, Dearwater SR, Kriska AM, Cauley JA, Aaron DJ, LaPorte RE. 1992. The epidemiology of low back pain in an adolescent population. Am J Public Health 82(4):606-8.

OMS. 1987. El Trabajo de los niños: riesgos especiales para la salud. OMS, editor. Ginebra: OMS. 52 p.

Parker D. 1997. Child labor: the impact of economic exploitation on the health and welfare of children. Minnesota Medicine 80(7):10-13-52-55.

Roncarati A, McMullen W. 1988. Correlates of low back pain in a general population sample: a multidisciplinary perspective. J Manipulative Physiol Ther 11(3):158-64.

Rossignol M, Suissa S, Abenhaim L. 1988. Working disability due to occupational back pain: three-year follow-up of 2,300 compensated workers in Quebec. J Occup Med 30(6):502-5.

Rothman KJ, Greenland S. 1998. Modern epidemiology, 2nd Edition. Philadelphia: Lippincott-Raven Publishers. 737 p.

UNICEF. 1997. The state of the world's children 1997. Oxford: Oxford University Press.

UNICEF. 1999. Child domestic work. Innocenti Digest 5:20.

Viry P, Creveuil C, Marcelli C. 1999. Nonspecific back pain in children. A search for associated factors in 14-year-old schoolchildren. Rev Rhum Engl Ed 66(7-9):381-8.

Figure I: Analysis Model. Pelotas, RS, Brazil, 1998.

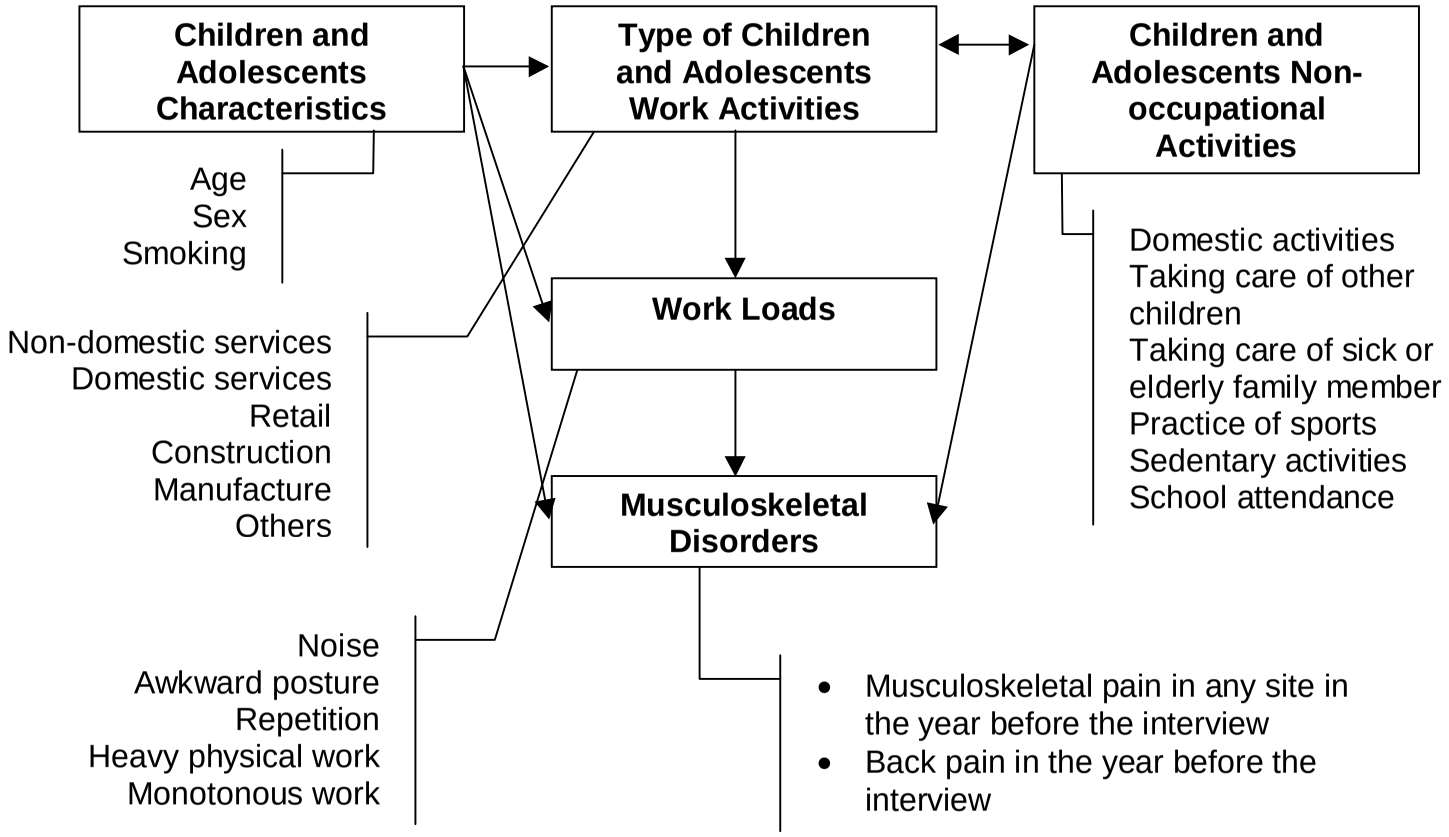

Table I: Prevalence (%) of pain in the following sites in the year before the interview work activity (n=3269). Pelotas, RS, Brazil, 1998.

Work Activities	Not currently working	Non-domestic services	Domestic services	Retail	Construction	Manufacture	Others	Total
n	2816	110	90	152	58	21	17	3264
Neck	21.8	26.4	27.8	18.4	20.7	42.9	23.5	22.1
Shoulder	9.7	17.3	10.0	11.2	8.6	19.0	5.9	10.1
Elbow	3.6	4.5	4.4	2.0	6.9	-	-	3.6
Wrists/hands	16.2	20.0	16.7	17.8	15.5	42.9	11.8	16.6
Upper back	15.2	13.6	18.9	19.7	19.0	23.8	11.8	15.5
Low back	13.3	12.7	11.1	10.5	17.2	9.5	-	13.1
Thigh	9.7	14.5	10.0	11.8	10.3	19.0	-	10.0
Leg	14.5	13.8	18.9	12.5	15.5	14.3	-	14.5
Knee	17.5	22.7	25.6	11.2	12.1	19.0	11.8	17.5
Ankles and feet	9.8	13.6	12.2	7.9	8.6	9.5	17.6	9.9
Any site	66.2	62.7	78.9	61.2	74.1	90.5	52.9	66.4

Continuing Table I

Work Activities	Not currently working	Non-domestic services	Domestic services	Retail	Construction	Manufacture	Others	Total
n	2816	110	90	152	58	21	17	3264
Back pain	41.2	41.8	54.4	41.4	44.8	71.4	29.4	41.8

Table II. Prevalence (%) of workloads by type of work (n=451). Pelotas, RS, Brazil, 1998.

Work activities	n	Noise	Awkward posture	Monotonous work	Repetition	Heavy physical work
Non-domestic services	105	10.5	24.8	15.2	45.7	21.0
Domestic services	71	7.0	16.9	14.1	22.5	15.5
Retail	142	9.9	21.8	19.7	36.6	18.3
Construction	50	4.1	28.0	12.0	54.0	32.0
Manufacture	21	23.8	33.3	38.1	66.7	23.8
Others	15	13.3	13.3	6.7	40.0	6.7
Total	404	9.7	22.8	17.1	40.3	20.0

**missing cases=47*

Table III. Crude analysis of the confounders by musculoskeletal pain, in any site, in the year before the interview (n=3269). Pelotas, RS, Brazil, 1998.

	n	%	OR	95% CI
Age (years old)				
10 to 11	809	59.1	1	
12 to 13	850	67.6	1.45	1.18 - 1.77
14 to 15	854	71.2	1.71	1.40 - 2.10
16 to 17	753	67.6	1.44	1.17 - 1.77
Gender				
Male	1665	65.5	1	
Female	1601	67.4	1.09	0.94 - 1.26
Smoking				
No	3019	66.2	1	
Yes	247	69.2	1.15	0.87 – 1.52
Practice of sports				
No	684	62.6	1	
Yes	2582	67.5	1.24	1.04 – 1.48
Use computer, video-game, VCR				
No	935	63.5	1	
Yes	2331	67.7	1.20	1.03 – 1.41
School attendance				
No	203	60.1	1	
Yes	3064	66.9	1.34	1.00 - 1.79

Continuing Table III

	n	%	OR	95% CI
Domestic activities*				
None	69	55.1	1	
At least one light	116	60.3	1.24	0.68 – 2.27
At least one moderate	751	62.7	1.37	0.83 – 2.26
At least one heavy	1714	67.4	1.69	1.03 – 2.74
All heavy	617	70.7	1.97	1.19 – 3.26
Taking care of other children				
No	1743	64.8	1	
Yes	1524	68.4	1.18	1.02 – 1.36
Taking care of sick or elderly family member				
No	3047	66.0	1	
Yes	220	73.2	1.41	1.04-1.92

** Light: to tidy up the house, to carry things, to be sent for small activities*

Moderate: to help with cooking, to remove dust, to do shopping, to sweep out the house, to wash dishes, to fix things

Heavy: to cook, to clean up the house, to wash clothes, to hang clothes to dry

OR - Odds Ratio

95% CI – 95% confidence interval

Table IV. Crude analysis of the mediators by musculoskeletal pain, in any site, in the year before the interview (n=3269). Pelotas, RS, Brazil, 1998.

Workloads	n	%	OR	95% CI
Noise*	39	79.5	1.97	0.90 – 4.30
Awkward posture**	92	80.4	2.11	1.26 – 3.56
Repetition**	164	75.6	1.60	1.11 – 2.30
Heavy physical work**	81	77.8	1.79	1.06 – 3.04
Monotonous work**	70	78.6	1.87	1.05 – 3.33

** missing cases = 48*

*** missing cases = 47*

OR - Odds Ratio

95% CI – 95% confidence interval

Table V. Association between work activities and musculoskeletal pain, in any site, in the year before the interview (n=3269). Pelotas, RS, Brazil, 1998.

Work activities	Crude		Adjustment 1		Adjustment 2	
	OR	95% CI	OR	95% CI	OR	95% CI
Not currently working	1		1		1	
Non-domestic services	0.86	0.58 – 1.27	0.82	0.54 – 1.22	0.48	0.29 – 0.78
Domestic services	1.91	1.14 – 3.18	1.89	1.12 – 3.17	1.37	0.75 – 2.50
Retail	0.81	0.58 – 1.13	0.76	0.54 – 1.07	0.51	0.33 – 0.78
Construction	1.46	0.81 – 2.65	1.40	0.77 – 2.55	0.67	0.33 – 1.37
Manufacture	4.85	1.13 – 20.87	4.73	1.09 – 20.63	2.20	0.47 – 10.30
Others	0.57	0.22 – 1.49	0.59	0.23 – 1.57	0.56	0.19 – 1.66

Adjustment 1: age; use of computer, video game or VCR; school attendance and domestic activities

Adjustment 2: adjustment 1 + repetition; awkward posture; monotonous work; heavy physical work; noise

OR - Odds Ratio

95% CI – 95% confidence interval

Table VI. Crude analysis of the confounders by back pain in the year before the interview (n=3269). Pelotas, RS, Brazil, 1998.

	n	%	OR	95% CI
Age (years old)				
10 to 11	809	32.5	1	
12 to 13	850	42.2	1.52	1.24 - 1.85
14 to 15	854	44.7	1.68	1.38 - 2.05
16 to 17	753	48.1	1.92	1.57 - 2.36
Gender				
Male	1665	38.6	1	
Female	1601	45.2	1.31	1.14 - 1.50
Smoking				
No	3019	41.0	1	
Yes	247	52.6	1.60	1.24 - 2.08
Practice of sports				
No	684	43.0	1	
Yes	2582	41.0	0.94	0.79 - 1.12
Use computer, video-game, VCR				
No	935	42.2	1	
Yes	2331	41.7	0.98	0.84 - 1.14
School attendance				
No	203	44.8	1	
Yes	3064	41.6	0.89	0.66 - 1.17

Continuing Table VI

	n	%	OR	95% CI
Domestic activities				
None	69	29.0	1	
Light	116	32.8	1.19	0.62 - 2.28
Moderate	751	36.1	1.38	0.81 - 2.38
At least one heavy	1714	43.0	1.85	1.09 - 3.13
All heavy	617	48.8	2.33	1.36 - 4.02
Taking care of other children				
No	1743	39.4	1	
Yes	1524	44.6	1.23	1.07 - 1.42
Taking care of sick or elderly family member				
No	3047	41.5	1	
Yes	220	46.4	1.22	0.93 – 1.60

OR - Odds Ratio

95% CI – 95% confidence interval

Table VII. Crude analysis of the mediators by back pain, in the year before the interview (n=3269). Pelotas, RS, Brazil, 1998.

Workloads	n	%	OR	95% CI
Noise	39	64.1	2.50	1.29 – 2.83
Awkward posture	92	62.0	2.31	1.51 – 3.54
Repetition	164	49.4	1.51	0.97 – 2.34
Heavy physical work	81	51.9	1.37	1.00 – 1.88
Monotonous work	70	65.7	2.71	1.65 – 4.47

OR - Odds Ratio

95% CI – 95% confidence interval

Table VIII. Association of work activities and back pain in the year before the interview (n=3269). Pelotas, RS, Brazil, 1998.

Work activities	Crude		Adjustment 1		Adjustment 2	
	OR	95% CI	OR	95% CI	OR	95% CI
Not currently working	1		1		1	
Non-domestic services	1.02	0.70 – 1.51	0.93	0.62 – 1.38	0.66	0.40 – 1.07
Domestic services	1.70	1.12 – 2.60	1.49	0.97 – 2.29	1.14	0.68 – 1.90
Retail	1.01	0.72 – 1.41	0.91	0.65 – 1.28	0.67	0.45 – 1.05
Construction	1.16	0.69 – 1.95	1.07	0.63 – 1.84	0.98	0.51 – 1.90
Manufacture	3.56	1.38 – 9.21	3.34	1.27 – 8.75	1.87	0.65 – 5.37
Others	0.59	0.21 – 1.69	0.54	0.19 – 1.57	0.51	0.17 – 1.56

Adjustment 1: age; gender; smoking; domestic activities and take care of other children

Adjustment 2: adjustment 1 + awkward posture; monotonous work; noise; repetition; heavy physical work

OR - Odds Ratio

95% CI – 95% confidence interval

ACKNOWLEDGMENTS

This study was supported by the following Brazilian agencies: CAPES, Ministry of Education, Brazil; CNPq, Ministry of Science and Technology and Rede Unitrabalho. This study was also supported by the Fulbright Scholars Program; the Pan-American Health Organization (PAHO); the Takemi Program in International Health through the Merck Company Foundation and the Harvard Program in Occupational Safety and Health through the NIH ESO 002 and the Liberty Mutual, of the Harvard School of Public Health, USA.

Universidade Federal de Pelotas
Departamento de Medicina Social
Programa de Pós-graduação em Epidemiologia

Trabalho Infantil,

Educação e Saúde

Projeto de Pesquisa

Luiz Augusto Facchini

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1997

APRESENTAÇÃO

O projeto *Trabalho Infantil, Educação e Saúde* será desenvolvido na Universidade Federal de Pelotas, através de uma parceria do Programa de Pós-Graduação em Epidemiologia e do Núcleo de Saúde do Trabalhador do Departamento de Medicina Social (DMS).

O estudo caracterizará detalhadamente uma amostra de 4.390 crianças, representativa dos setores urbanos pobres de Pelotas. Preenchendo lacunas identificadas na revisão bibliográfica, serão investigadas as relações entre trabalho infantil, educação e saúde. No âmbito do trabalho será realizado uma detalhada caracterização do contexto familiar, das diversas formas de uso da força de trabalho infantil e da utilização dos recursos produzidos pelas crianças para a reprodução familiar e social. Tendências de uso do trabalho infantil serão investigadas em termos de faixa etária, cor da pele e gênero dos crianças e nível sócio-econômico da família. Em termos educacionais, serão caracterizadas a exclusão infantil da escola, a repetência e muitos outros aspectos do desempenho escolar, estabelecendo seus nexos com as atividades laborativas. Quanto a saúde, será verificado a ocorrência de acidentes, problemas comportamentais e de desenvolvimento, músculo-esqueléticos, respiratórios e de pele.

As atividades do projeto e sua abordagem representam contribuições significativas no âmbito da pesquisa epidemiológica sobre trabalho infantil, considerando que, em nosso país, a informação disponível sobre saúde e segurança de crianças e adolescentes trabalhadores é escassa, fragmentada e incompleta. Esta situação aumenta a relevância de estudos populacionais capazes de identificar as

crianças sob maior risco de acidentes e doenças relacionadas ao trabalho, apoiar o estabelecimento de programas de prevenção e controle do trabalho infantil e identificar áreas para incrementar ou implementar a legislação e a formulação de políticas públicas.

A epidemiologia, como disciplina básica da saúde pública, marcada pelo forte acento interdisciplinar de seu objeto de estudo, tem capacidade de revelar o panorama e as particularidades do trabalho infantil e de seu impacto sobre a saúde, em um contexto histórico e social. A partir de um diagnóstico do perfil socioeconômico, ocupacional e educacional das crianças trabalhadoras e de seu impacto na saúde, será possível estabelecer prioridades e estratégias efetivas não apenas para coibir a exploração da força de trabalho das crianças, mas também para potencializar a capacidade dos jovens se inserirem de modo mais vantajoso no mercado de trabalho.

O estudo também fortalece a inserção científica do Departamento de Medicina Social da UFPel na formação de recursos humanos, oportunizando a máxima titulação acadêmica a membros da equipe do projeto, iniciando um significativo número de estudantes de graduação no cotidiano científico e capacitando trabalhadores e lideranças sindicais para um enfrentamento mais qualificado do problema em estudo. Entretanto, a possibilidade de capacitação de recursos humanos em saúde do trabalhador extrapola o âmbito acadêmico, abrangendo autoridades, educadores e profissionais de saúde do município, região e estado.

Neste contexto, o projeto será objeto de minha Dissertação de Doutorado que constará da revisão bibliográfica sobre trabalho infantil e saúde, da análise detalhada

do perfil ocupacional das crianças trabalhadoras de Pelotas-RS e da avaliação das associações entre trabalho infantil e problemas músculo-esqueléticos.

Anaclaudia Gastal Fassa

INTRODUÇÃO

Justificativa

O trabalho infantil tem sido identificado ao longo da história da humanidade. Entretanto, como problema social, ético e político, sua presença no cenário internacional remonta há pelo menos 200 anos. Assumindo proporções alarmantes na Inglaterra em fins do século 18, quando crianças de cinco e seis anos eram forçadas a trabalhar de 13 a 16 horas por dia, esta realidade continua atual às vésperas do século 21(Lee, 1996; Child Labor Coalition, 1997; Satyarthi, 1997).

Sabe-se que as crianças são forçadas a trabalhar devido a uma grande variedade de razões, geralmente ligadas à miséria e ao desrespeito aos direitos sociais infantis. Em muitos países do Terceiro Mundo, a falta de escolarização adequada e a pobreza destacam-se como as causas básicas deste problema. Para muitas famílias de baixa renda, o trabalho infantil é a única estratégia disponível para enfrentar às demandas da sobrevivência mínima, especialmente em termos de alimentação. Por outro lado, os governos de muitos países do Terceiro Mundo fazem vistas grossas à exploração infantil, uma vez que os trabalhadores infantis constituem um grande contigente, ganham pouco e produzem muito (Lee, 1996; Child Labor Coalition, 1997).

No plano da saúde pública sabe-se que muitas crianças estão submetidas a trabalhos perigosos à saúde, determinando um desgaste intenso e precoce não só físico, mas também mental. Estes danos não ocorrem apenas em crianças que trabalham na agricultura, mineração, serrarias, construção e outros processos industriais perigosos, mas também naquelas submetidas ao trabalho doméstico continuado. Os danos à saúde dos trabalhadores infantis decorrem tanto das

exposições ocupacionais a que estão cotidianamente submetidos, quanto do impedimento de viverem plenamente a infância, brincando com outras crianças e desenvolvendo suas potencialidades físicas e afetivas (Lee, 1996; Child Labor Coalition, 1997; Satyarthi, 1997).

Os efeitos nocivos do trabalho na saúde e no desenvolvimento das crianças trabalhadoras, tanto a curto quanto a longo prazo, significam um pesada herança social. Após anos de exploração do trabalho infantil, a sociedade acaba forjando uma população trabalhadora mais pobre, doente e ignorante. Este perfil sócio-demográfico pode resultar em maiores demandas aos serviços públicos de saúde, pressionando os gastos governamentais em direção às ações curativas, em detrimento das ações de prevenção e promoção da saúde (Lee, 1996; Child Labor Coalition, 1997; Satyarthi, 1997).

Considerando este quadro dramático, por que é tão difícil evitar a exploração e a semi-escravidão infantil, não apenas em países pobres, mas também em economias ricas como a dos Estados Unidos? Qual o papel das famílias, empregadores, governos e sociedade civil no controle e prevenção deste problema? Que dimensões o problema assumirá com a globalização da economia, a flexibilização das leis trabalhistas e os cortes nas políticas sociais? Qual a relação entre desemprego, trabalho informal mal remunerado e trabalho infantil? Qual a importância do problema em regiões com razoáveis níveis de desenvolvimento, mas em processo de estagnação e/ou transição econômica? Qual o impacto do trabalho infantil na saúde das crianças trabalhadoras?

Todas estas questões têm apresentado respostas controversas e podem variar em diferentes conjunturas e regiões, seja a nível nacional ou internacional. Portanto,

são questões que requerem mais e melhores investigações, com vistas a fornecer subsídios mais consistentes à tomada de decisão por parte da sociedade civil e dos governos. Neste contexto e à semelhança do que vem ocorrendo em outras disciplinas científicas, as questões referentes ao trabalho infantil devem constituir-se em problema de investigação prioritário para as áreas de Epidemiologia e Saúde do Trabalhador.

Trabalho e Bem-Estar Infantil: Algumas Evidências

Endêmico e às vezes escandalosamente freqüente em países subdesenvolvidos, o trabalho infantil também ocorre em países ricos. Apesar disso, dispõe-se de pouca informação sobre acidentes, doenças e efeitos no crescimento e desenvolvimento dos milhões de crianças cotidianamente expostas à atividades inseguras, substâncias tóxicas e riscos ergonômicos, dentre outros problemas decorrentes da exploração infantil no trabalho em todo o mundo. Ainda assim, estima-se que a magnitude e severidade das doenças ocupacionais em crianças sejam significativamente maiores do que nos adultos, pois diferenças fisiológicas no tamanho, metabolismo e absorção, dentre outros aspectos devem tornar as crianças mais suscetíveis a problemas de saúde relacionados com o trabalho (Richter ED, Jacobs J, 1991; Cooper SP, Rothstein MA, 1995; Satyarthi, 1997).

Em 1979, estudos referiam que mais de 50 milhões de crianças menores de 16 anos de idade trabalhavam em atividades freqüentemente perigosas e insalubres em todo o mundo. Boa parte dessas crianças viviam em países subdesenvolvidos da América Latina, Ásia e África, em condições de vida precárias e com acesso limitado à educação. Entretanto, atualmente estima-se que 200 milhões de crianças são

continuamente exploradas em todo o mundo. Na Índia, um terço da força de trabalho tem menos de quatorze anos de idade. Apesar disso, os legisladores daquele país têm relutado em criminalizar o trabalho infantil. No Brasil, onde a situação do trabalho infantil também é alarmante, as crianças tem sido exploradas desde os canaviais nordestinos, serrarias e indústrias do sul e sudeste, até as ruas das grandes cidades. Forçadas a trabalhar sob condições inumanas, milhões de crianças em todo o planeta são privadas de liberdade, infância, educação e diversão, tendo seus sonhos e aspirações totalmente destruídos (Satyarthi, 1997; Child Labor Coalition, 1997; Lee, 1996; Golodner, 1996; Gupta, 1997).

A Academia Americana de Pediatria (APA) estima que anualmente 100 mil crianças sofram acidentes de trabalho nos Estados Unidos. Além dos eventos mais comuns, crianças e adolescentes americanos têm sido vítimas de sérios acidentes de trabalho, como por exemplo amputações, queimaduras, fraturas, perda ocular e eletrocutamento. Em 1991 foram registrados cerca de 1100 acidentes relacionados ao trabalho, em menores de dezoito anos, apenas no estado do Texas (National Safe Workplace Institute, 1992; Cooper SP, Rothstein MA, 1995).

Em estudo realizado na área industrial de Alexandria no Egito, 45% das crianças trabalhadoras entre 8 e 18 anos de idade apresentavam déficit nutricional. Estas crianças também apresentavam ingesta deficiente de alimentos energéticos, cálcio, vitaminas A, C e niacina, além de uma alta prevalência (72%) de infecções parasitárias (El-Sahn F, 1992).

Na Índia, estima-se que cerca de 80% das crianças com tuberculose são trabalhadoras. Exposições constantes à fumaça, poeira, altas temperaturas e

substâncias químicas afetam os pulmões, olhos, rins e outros órgãos vitais de milhares de crianças trabalhadoras. O trabalho sentado em posição viciosa durante longas jornadas, em lugares insalubres, como por exemplo as fabricas de tapete, tem mostrado forte associação com déficit no crescimento e desenvolvimento e, particularmente, com problemas de coluna e visão (Satyarthi, 1997).

Além disso, também existem evidências de que o trabalho precoce tem um forte efeito negativo sobre a educação de adolescentes. O excesso de trabalho tende a interferir sobre a motivação, desempenho e atenção escolares de adolescentes, fazendo com que esforços direcionados a formação profissional da juventude sejam desperdiçados. Pesquisas em adolescentes tem encontrado fortes associações entre trabalho excessivo, pior desempenho escolar, maior consumo de drogas, álcool e atitudes negativas em relação ao trabalho (Child Labor Coalition, 1997).

Alguns estudos mostram uma maior freqüência de trabalho infantil em comunidades onde os pais estão mais expostos ao trabalho eventual e/ou sazonal e onde os salários são insuficientes para garantir as condições mínimas de subsistência (Satyarthi, 1997).

Considerando estes achados e tentando orientar os pais sobre a questão do trabalho infantil, a *National Consumers League* dos Estados Unidos formulou algumas recomendações. Por exemplo, até os 14 anos de idade, as crianças deveriam dedicar-se apenas às tarefas da escola e da família, preparando suas potencialidades físicas e afetivas para os desafios do futuro. Entre os 14 e os 15 anos, as crianças podem realizar algumas atividades no verão, durante um turno diário e no máximo cinco dias na semana. Dos 16 aos 17 anos, os adolescentes podem obter um emprego de férias

(verão), mas não devem trabalhar mais do que cinco dias na semana. Durante o período escolar, podem realizar algum trabalho remunerado, desde que não haja interferência nas atividades escolares (Greenberger, Steinberg, 1986; Golodner, 1996).

As evidências disponíveis revelam não apenas a tragédia, mas também a complexidade dos inúmeros aspectos vinculados ao trabalho de crianças e adolescentes. Felizmente, na atualidade observa-se um importante esforço de governos e instituições da sociedade civil de muitos países no sentido de controlar e prevenir a exploração infantil. A Organização Internacional do Trabalho (OIT) tem buscado o apoio dos países membros à resolução da idade mínima de 16 anos para a realização de qualquer trabalho. Entretanto, a OIT depende da adoção voluntária dessa medida pelos países, o que tem tornado a resolução inefetiva em muitas nações (Satyarthi, 1997; Child Labor Coalition, 1997; Lee, 1996; Golodner, 1996).

De qualquer maneira, a eliminação do trabalho infantil parece estar fortemente associada a capacidade das sociedades em proporcionar empregos dignos e bem remunerados às suas populações adultas e acesso compulsório à educação e saúde às suas populações infantis (Child Labor Coalition, 1997; Lee, 1996).

O Problema em Estudo

O trabalho infantil pode ser definido como o emprego regular de crianças abaixo da idade de maturidade física em trabalhos que requerem longas jornadas diárias. Entretanto, o termo “trabalho” aplica-se a relações sociais em que o indivíduo vende seu trabalho a um empregador, mediante condições pré-estabelecidas e aceitas por

ambos. Nas sociedades contemporâneas estas condições geralmente estão regulamentadas garantindo ao trabalhador certos níveis salariais e direitos sociais.

No caso do trabalho infantil, a definição capitalista ou moderna de trabalho dificilmente se aplica. A criança trabalhadora geralmente esta submetida a relações de servidão e até mesmo de escravidão, ficando totalmente subjugada à vontade do patrão, seja ele um membro da família ou um estranho.

Neste contexto, situam-se dois amplos problemas a serem abordados pelo presente estudo:

- Que tipo de trabalho realizam as crianças urbanas do extremo sul do Brasil, uma região razoavelmente desenvolvida, mas em processo de estagnação e/ou transição econômica?
- Que associações existem entre trabalho, educação e saúde em crianças trabalhadoras?

Relevância do Estudo

A questão do trabalho infantil é um tema com crescente interesse. Por um lado, há uma pressão internacional para o pleno reconhecimento dos direitos infantis e pelo controle e prevenção dos casos mundiais mais escandolosos de exploração infantil, dentre os quais se encontra o Brasil. Por outro lado, observa-se a desorganização, flexibilização e reestruturação da produção capitalista neste final de século, em função da globalização da economia e da revolução da informática. Estes processos estão promovendo o incremento do desemprego, emprego irregular e trabalho informal, cujas repercussões sociais são mais graves nos países do Terceiro Mundo, como o Brasil.

Esta situação parece pressionar às famílias a utilizarem recursos limites para a sobrevivência, no qual se destaca o trabalho infantil, em suas diferentes nuances, desde o pseudo-aprendizado até a prostituição e a escravidão.

Além disso, o trabalho infantil urbano tem significado e relevância especiais na atualidade, em função das migrações e do rápido crescimento das cidades. Em Pelotas, estima-se que o trabalho infantil apresente um perfil muito particular, pois a cidade situa-se numa das regiões mais desenvolvidas do país, o que dificulta a ocorrência de casos escandalosos de exploração infantil. Entretanto, esta região passa por uma estagnação econômica marcante, ocorrendo um acentuado processo de desindustrialização e aumento do desemprego e do trabalho informal.

Neste sentido, investigar detalhadamente o "trabalho" em seu sentido mais conceitual de vínculo com a sobrevivência, para cada membro da família, deverá propiciar um quadro muito revelador sobre o significado do trabalho infantil para as crianças e suas famílias.

Por outro lado, em nosso país são escassos os dados sobre saúde e segurança de crianças trabalhadoras. As poucas informações disponíveis são fragmentadas e incompletas. Esta situação aumenta a relevância de estudos capazes de identificar as crianças sob maior risco de acidentes e doenças relacionadas ao trabalho, apoiar o estabelecimento de programas de prevenção e controle do trabalho infantil e identificar áreas para incrementar ou implementar a legislação sobre o problema.

Conforme Linda Golodner, presidente da *Child Labor Coalition* dos Estados Unidos, “existem trabalhos seguros e adequados para os adolescentes, capazes de oferecer-lhes uma ampla e positiva experiência de vida. Entretanto, é responsabilidade

da sociedade manter a vigilância sobre o trabalho de adolescentes de modo a impedir a exploração e garantir-lhes a segurança e o bem-estar" (Golodner, 1996).

Na atualidade, dispõe-se de numerosos instrumentos legais de proteção à infância, como por exemplo as legislações nacionais, a Declaração dos Direitos Humanos e a Convenção sobre os Direitos da Criança, que buscam garantir um crescimento e desenvolvimento saudáveis a todas as crianças. Apesar disso, ainda hoje milhões de crianças estão submetidas a exploração e ao trabalho forçado em diversos setores da economia mundial. O enfrentamento efetivo deste grave quadro vem exigindo um profundo envolvimento dos governos e da sociedade civil. Neste caso, vale destacar a importância de pesquisadores e outros profissionais capazes de gerarem conhecimentos atualizados sobre esta dramática realidade.

Objetivos

Valendo-se de uma fundamentação teórica humanista e socialmente orientada, o estudo objetiva apoiar a luta pela garantia dos direitos das crianças à seguridade e o bem-estar social.

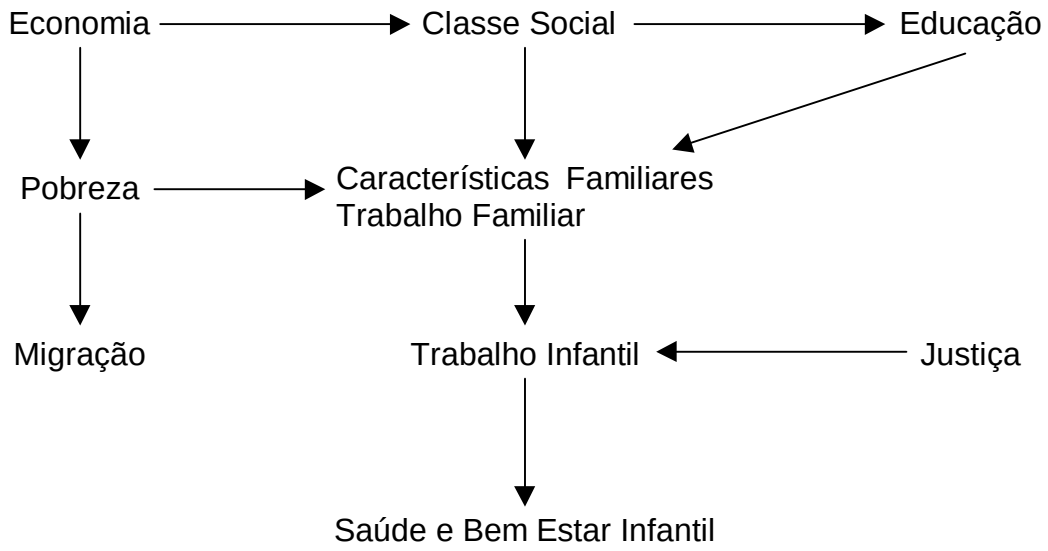
Neste contexto, propões-se os seguintes objetivos específicos:

- Realizar revisão bibliográfica sobre o tema trabalho infantil, saúde e educação
- Traçar um panorama do trabalho infantil em Pelotas, a partir de um estudo de base populacional.
- Caracterizar o trabalho infantil no contexto sócio-econômico familiar.
- Estabelecer as principais cargas de trabalho decorrentes do trabalho infantil.

- Investigar a associação entre trabalho, educação e saúde infantil.

- Relacionar o perfil de trabalho infantil identificado no estudo à legislação vigente, enfatizando os abusos e violações legais que estão sendo cometidos contra as crianças no município.

Figura 1. Modelo Teórico do Projeto Trabalho e Saúde Infantil. Pelotas, RS, Brasil, 1998.



METODOLOGIA

Revisão Bibliográfica

A revisão bibliográfica visa estabelecer o que já se sabe e ainda não se sabe sobre a problemática do trabalho infantil e sua relação com a saúde de crianças e adolescentes; quais as abordagens mais adequadas a esta problemática e quais as dificuldades mais importantes na investigação do trabalho infantil.

Serão revisados periódicos indexados, estatísticas de saúde pública, documentos de organizações intergovernamentais e relatórios oficiais e de divulgação governamental, dentre outros, principalmente publicados em português, inglês e espanhol, nos últimos 20 anos.

Os principais índices ou bases de dados a serem utilizados na revisão bibliográfica são Medline e Lilacs. Medline é a principal base de dados da Biblioteca Nacional de Medicina dos Estados Unidos e inclui todas as referências do Index Medicus. Lilacs é uma base de dados de alcance latino-americano e tem a vantagem de conter muitas referências sobre a região, publicadas em periódicos não indexados e em outros meios de divulgação (teses, boletins, relatórios), que não constam da Medline.

Inicialmente a busca enfocará descritores mais genéricos relacionados à temática em estudo, como por exemplo: *child labor, child work, child health, child nutrition, and teenagers work.* A seguir, serão identificados termos correlatos e sinônimos usados como descritores nas diferentes bases de dados e nos mais variados periódicos. Em todas as buscas, os descritores serão combinados a partir de "operadores lógicos" *(and, or, not)* com o objetivo de delimitar e precisar a bibliografia selecionada. As buscas serão direcionadas principalmente às áreas de saúde pública, epidemiologia, ciências sociais e antropologia.

Também serão rastreadas as páginas da rede eletrônica *Internet* que tratam sobre trabalho infantil, não só pelo fato de conterem informações relevantes sobre o tema, como também pela lista de publicações que disponibilizam.

Simultaneamente, serão reunidos publicações de circulação mais dirigida e local, notícias sobre a problemática do trabalho infantil e assuntos correlatos difundidos na mídia eletrônica e impressa, bem como, material sobre a legislação vigente e documentos e recomendações difundidas por organismos intergovernamentais.

Este acervo sobre o trabalho infantil em Pelotas e no mundo será fundamental para o estabelecimento da magnitude do problema, suas diversas formas de expressão e seus principais determinantes, bem como para o refinamento das diversas abordagens e etapas propostas pelo estudo. O acervo será utilizado na formação de recursos humanos em pesquisa populacional de grande porte, no Programa de Pós-Graduaçào em Epidemiologia do Departamento de Medicina Social da UFPel. Estará também à disposição da sociedade.

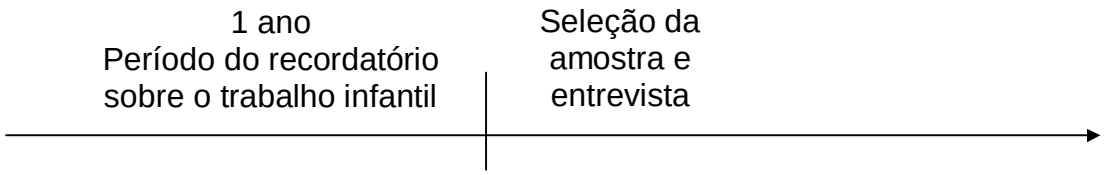
Estudo Epidemiológico

Delineamento

Para explorar a relação entre trabalho e saúde infantil em Pelotas, propõe-se um estudo epidemiológico transversal. As possibilidades de avaliar múltiplos aspectos da saúde infantil, que podem ser afetados de forma distinta pelo trabalho, bem como explorar associações entre a saúde infantil e diferentes níveis de exposição ao trabalho, foram levadas em conta na seleção de um estudo epidemiológico transversal. Além disso, os estudos transversais são relativamente baratos e podem ser realizados em tempo relativamente curto, aumentando a eficiência e efetividade do projeto, em uma primeira abordagem do problema em nossa região (Rothman, 1986; Kleinbaum et al., 1982).

Apesar do delineamento transversal não garantir a direcionalidade do efeito da variável independente (trabalho infantil) sobre a dependente (saúde infantil), é possível minimizar o problema da causalidade reversa, através de recordatórios sobre a inserção infantil no trabalho que antecedam o período de coleta de dados de certos desfechos, como por exemplo acidentes e dor nas costas. Por outro lado, este estudo não busca estabelecer relações de determinação entre trabalho e saúde em crianças, mas explorar associações e possíveis mediadores entre estas categorias.

Figura 2. Delineamento do Estudo Epidemiológico. Trabalho e Saúde Infantil. Pelotas, RS, Brasil, 1998.



População e Amostra

A população do estudo será constituída por famílias residentes em setores populares da área urbana de Pelotas, com filhos entre 6 e 17 anos de idade. Propõe-se selecionar uma amostra de 4.390 crianças entre 6 e 17 anos de idade, em que se fará a caracterização exaustiva do trabalho infantil no contexto familiar.

A seguir são apresentados os parâmetros utilizados no cálculo do tamanho da amostra para uma prevalência de problemas de saúde (dor nas costas) de cerca de 5% nas crianças que não trabalham.

Nível de Confiança	Poder estatístico	Razão expostos/ não expostos	Risco Relativo	Não expostos	Expostos	Total	Amostra final *
95 %	80 %	9:1	1.8	3.123	3447	3.470	4390

* total + 15% para controle de fatores de confusão e 10% para controle de perdas

Trabalho Infantil – definição

Considera-se trabalho infantil qualquer atividade laborativa regular, remunerada ou não, domiciliar ou não. Esta definição procura captar desde as atividades infantis de auxílio às demandas domésticas (cuidado da casa ou de irmãos menores) até o trabalho formal remunerado (empacotador de supermercados), passando por uma variada gama de atividades informais (catadores de papéis, guardadores de carros). Será caracterizada a inserção das crianças no trabalho no ano anterior a entrevista.

Educação - indicadores

A educação é um dos principais problemas relacionados ao trabalho infantil, seja como seu determinante ou como sua consequência. Dificuldades de acesso à escolas públicas e de desempenho escolar costumam pressionar crianças pobres a ingressarem precocemente na força de trabalho. Por outro lado, crianças trabalhadoras dificilmente conseguem frequentar a escola e progredir num ritmo semelhante ao das crianças que não trabalham.

Nesta perspectiva, o estudo epidemiológico caracterizará um amplo conjunto de indicadores relativos à educação infantil. Aprovação, repetência, pontualidade, atenção, cansaço, realização das tarefas e evasão estão entre os aspectos da vida escolar avaliados neste estudo.

Saúde - indicadores

Acidentes

Serão caracterizados pormenorizadamente os acidentes sofridos pela criança no ano anterior à entrevista. Neste caso, não se está restringindo o estudo a acidentes de trabalho, que seriam muito escassos, não apenas em função dos tradicionais problemas de notificação, mas também devido aos aspectos legais do emprego de crianças. Esta estratégia tem a vantagem de aumentar as prevalências do desfecho, incrementando a eficiência da análise estatística.

Comportamento e Desenvolvimento

As crianças serão avaliadas em relação a aspectos comportamentais e de desenvolvimento, através do *Child Behavior Check List (CBCL)*, em sua versão para o português. Através de 113 questões, este instrumento, respondido pela mãe ou responsável pela criança, procura caracterizar a quantidade e qualidade da participação infantil em esportes, lazer, jogos, brincadeiras, atividades domésticas e escolares, bem como suas relações familiares e com os amigos. Estas competências infantis estão agrupadas em três grandes grupos: atividades, social e escola. As respostas a cada questão foram estruturadas através de um escala ordinal: 0 = não; 1 = algumas vezes e 2 = frequentemente (Achenbach, 1991).

Problemas Músculo-Esqueléticos

A ocorrência de problemas músculo-esqueléticos será captada através da referência de dor ou mal-estar localizado nas diversas localizações corporais no ano anterior à entrevista e na semana anterior à entrevista. Será solicitado ao entrevistado que localize em uma figura o problema ocorrido, conforme recomendação de Kuorinka (1987) para investigação de sintomas músculo-esqueléticos.

Problemas Respiratórios

Problemas respiratórios geralmente são a principal causa de consulta infantil. Atualmente problemas clássicos como infecções respiratórias estão cedendo lugar a asma e chiado, que atingem uma importância crescente na demanda dos serviços de saúde em todo o mundo. A ocorrência de problemas respiratórios, com especial ênfase para asma, será feita seguindo-se as recomendações da *American Thoracic Society (ATS)*, para investigação populacional (*ver questionário infantil*) (Ferris, 1978).

Problemas de Pele

Serão caracterizados pormenorizadamente os problemas de pele ocorridos na semana anterior à entrevista. Neste caso, não se está restringindo o estudo a sinais e sintomas dermatológicos, englobando-se também os parasitas que costumeiramente ocorrem nas populações infantil e de baixa renda (*ver questionário infantil*).

Categorias, Variáveis e Indicadores

Variáveis Familiares e Sócio-econômicas

Quadro 1. Variáveis Familiares e Sócio-econômicas Selecionadas. Trabalho e Saúde Infantil. Pelotas, RS, Brasil, 1998.

Variáveis familiares	**Características**
Classe Social do chefe da família	Relação com a produção Posição no trabalho Escolaridade Renda
Renda	Renda mensal total
Tipo de família	Chefe da família Nº de gerações na família Nº de pessoas na família Imigração
Trabalho dos membros da família (exceto crianças)	Setor econômico Ocupação (função)
Características do domicílio	Nº de peças Água encanada Sanitário com descarga Veículos

Continuação Quadro 1

Variáveis familiares	**Características**
Utilidades domésticas	Rádio TV Chuveiro elétrico Geladeira Liquidificador Máquina de lavar roupa Estufa/aquecedor
Consumo familiar	Aluguel Alimentação Vestuário Transporte Saúde Escola Creche Água, luz, gás
Idade dos membros da família	Idade em anos completos
Escolaridade dos membros da família	Nº de anos completados
Etnia (raça)	Cor da pele
Estado civil (pai/mãe)	Estado civil de fato

Variáveis Infantis

Quadro 2. Variáveis Infantis Selecionadas. Trabalho e Saúde Infantil. Pelotas, RS, Brasil, 1998.

Variáveis infantis	**Características**
Idade	Anos completos
Gênero	Gênero
Etnia	Cor da pele
Estado civil	Estado civil de fato
Escolaridade	Anos completados Reprovações Evasão Desempenho (assiduidade/ freqüência, satisfação)
Hábitos	Tabagismo, Álcool, Drogas, Recreação
Morbidade	Músculo-esquelética (lombalgia) Problemas de pele Problemas respiratórios
Acidentes em geral	Tipo de acidentes Número de acidentes Gravidade

Continuação Quadro 2

Variáveis infantis	**Características**
Comportamento e desenvolvimento	Atividades Social Escolar
Utilização de serviços de saúde	Hospitalização Consulta médica Imunização
Violência e maus tratos	Domiciliar Bairro Trabalho

Variáveis Ocupacionais

Quadro 3. Variáveis Ocupacionais Infantis Selecionadas. Trabalho e Saúde Infantil. Pelotas, RS, Brasil, 1998.

Variáveis Ocupacionais	**Características**
Trabalho doméstico	Tarefas Jornada semanal Remuneração (dinheiro ou outros)

Continuação Quadro 3

Trabalho fora de casa	Atividade produtiva Tarefas realizadas Com quem trabalha (sozinho, com supervisão) Jornada semanal e intervalos Turno e revezamento Remuneração Carteira ou contrato de trabalho assinados Equipamentos e ferramentas utilizados Treinamento para a função Exposição a cargas de trabalho
Porque trabalha ?	Necessidade, por opção, …
Consumo familiar	Contribuição financeira para o consumo familiar

Coleta de Dados: Aspectos Logísticos

Os setores censitários populares serão identificados de acordo com os critérios sócio-econômicos definidos pelo IBGE para o Censo de 1991.

Considerando que a cidade de Pelotas tem uma população urbana de 265.192 habitantes, uma média de 3,5 pessoas por domicílio e uma proporção de 23% de pessoas na faixa etária estudada (IBGE,1991), será necessário a visita a cerca de 4.000 domicílios para estabelecer a amostra proposta. Dessa forma, dentre os setores populares, foram sorteados 23, sendo visitados todos os domicílios em cada um.

Cada família será visitada por dois entrevistadores. Obtida a concordância da dona da casa em participar do estudo, um auxiliar de pesquisa entrevistará a mãe, preenchendo os questionários familiar e comportamental infantil. Simultaneamente, o outro auxiliar de pesquisa entrevistará a criança, preenchendo o questionário infantil.

Análise dos Dados

No estudo, a amostra de crianças de 6 a 17 anos será analisada através de uma abordagem hierarquizada, conforme o Modelo Teórico apresentado na Figura 1. A análise de dados será realizada através do software SPPS for Windows (Norussis MJ, 1995).

A seguir estão resumidos os passos da análise de dados.

Estudo Descritivo

Examinará as prevalências das variáveis sob estudo (proporções e médias).

Estudo Analítico: Análises Bivariada e Multivariada

Examinará as associações estatísticas, através de análise bivariada e multivariada entre:

- Variáveis Familiares e Trabalho Infantil
- Variáveis Infantis e Trabalho Infantil
- Variáveis Familiares e Saúde Infantil
- Trabalho Infantil e Saúde Infantil

CONTRIBUIÇÕES E USOS DOS RESULTADOS

No Brasil, sabe-se que o problema do trabalho infantil é grave, mas a situação na região sul do Rio Grande do Sul é praticamente desconhecida. Neste sentido, o estudo poderá contribuir para a definição dos contornos do trabalho infantil em uma região do país com desemprego e trabalho informal importantes.

O estudo também será útil para estabelecer o papel das crianças trabalhadoras no contexto familiar. Além disso, o estudo poderá revelar as relações entre a questão do trabalho infantil e da reprodução social no âmbito de famílias operárias em processo de descenso social.

Propõe-se a utilização dos resultados do estudo no desencadeamento de esforços institucionais contra a exploração de crianças e o trabalho infantil. Neste sentido, os achados do estudo deverão ser publicados em brochuras de ampla circulação, procurando informar crianças, sobre o problema do trabalho infantil na cidade. No caso do trabalho de menores legalmente permitido (adolescentes), espera-se orientar empregadores, crianças e famílias sobre a legislação vigente e a importância do trabalho salubre e seguro para os adolescentes.

Ainda no âmbito do intercâmbio interinstitucional, pretende-se realizar um amplo seminário sobre *Trabalho Infantil e Saúde*, com a participação de crianças, pais, professores, autoridades e representantes da sociedade civil organizada.

Os resultados e os recursos metodológicos úteis ao conhecimento da relação entre trabalho infantil e saúde também deverão ser difundidos nos cursos regulares de graduação e pós-graduação do Departamento de Medicina Social da UFPel e em

atividades de educação continuada dirigidas aos profissionais de saúde da cidade, da região e do país.

REFERÊNCIAS BIBLIOGRÁFICAS

Achenbach TM, 1991. Manual for the Child Behavior Check-list/4-18 and 1991 Profile. Burlington, VT: University of Vermont.

Child Labor Coalition, 1997. Executive Summary, Is Your Teen Safe On the Job?

Cooper SP, Rothstein MA, 1995. Health hazards among working children in Texas, *South Med J* 88(5):550-4.

El-Sahn F, 1992. Dietary patterns and nutritional assessment of working children at Abou El-Dardar industrial area in Alexandria City, *J Egypt Public Health Assoc* 67(1-2):119-45.

Ferris bg, 1978. Epidemiology standardization project, *Am Rev Respir Dis* 118:1-120.

Golodner L, 1996. Work Safe This Summer!, *Child Labor Monitor* 6(1), June 1996.

Greenberger E, Steinberg L, 1986. When Teenagers Work: The Psychological and Social Costs of Adolescent Employment, National Safe Workplace Institute.

Gupta S, 1997. Labor & Child Labor, Media Web India, *Indian Economy Basics* 1996-1997.

Kleinbaum DG, Kupper LL, Morgenstern H, 1982. Epidemiologic Research, Principles and Quantitative Methods. New York, Lifetime Learning Publ.

Kuorinka, I.; Johnsson, B.; Vinterberg, H. et al. Standardised Nordic Questionnaires for the Analysis of Musculoskeletal Synptoms. Applied Ergonomics, 1987; 18(3):233-37.

Lee E, 1996. Child Labor, *Child Labor Monitor* 6(1), June 1996.

National Safe Workplace Institute, 1992. Sacrificing America's Youth: The Problem of Child Labor and the Response of Government.

National Center for Health Statistics (NCHS), 1978. Growth Curves for Children, Bith-18 years old. Hyattsville, DHEW Publication PHS 78-1650 (series 11, no.165).

Norussis MJ, 1994. SPSS/PC +: Statistical Package for Social Sciences. Chicago, SPSS Inc.

Richter ED, Jacobs J, 1991. Work injuries and exposures in children and young adults: review and recommendations for action, *Am J Ind Med* 19(6):747-69.

Rothman KJ, 1986. Modern Epidemiology. Boston, Little Brown Press.

Satyarthi K, 1997. Break The Chains - Save The Childhood, Springfield, Friends At Home Inc.

Young ML, 1992. Analysing Household Histories, in: Berquó E, Xenos P (editors) Family Systems and Cultural Change. Oxford, Clarendon Press.

CRONOGRAMA: outubro de 1997 a setembro de 1998

ano	1997			1998								
Mês	out	nov	dez	jan	fev	mar	abri	mai	jun	jul	ago	set
Revisão Bibliográfica												
Elaboração dos instrumentos de coleta de dados												
Seleção e treinamento dos auxiliares de pesquisa												
Estudos pré-piloto e piloto												
Definição da amostra e coleta dos dados												
Codificação, revisão e digitação dos dados												
Preparação e edição dos dados												
Análise dos dados												
Redação												
Divulgação dos resultados												

ORÇAMENTO

Item	Reais (R$)
CUSTEIO: **Material de consumo:** material de escritório, softwares, etc.	**3.000,00**
Passagens locais	**3.000,00**
Serviços de terceiros pessoa física: entrevistadores; editoração de formulários, manuais e relatórios; produção de vídeo e material audio-visual para apresentação dos resultados do estudo; assessoria em informática; secretaria e outros técnicos.	**42.866,00**
Serviços de terceiros pessoa jurídica: assistência técnica para equipamentos, fotocópias.	**800,00**
Outros serviços e encargos: comunicações (telefone, correio, fax).	**1.200,00**
TOTAL CUSTEIO	**50.866,00**
CAPITAL: **Equipamento e material permanente:**	
1 microcomputador Pentium 200 MHZ, 16 MB de memória RAM, placa de fax/modem 33.600 bps, winchester de 2.1 G, monitor color 0.28	2.000,00
1 estabilizador conversor	50,00
Sub total	**2.050,00**

Continuação do Orçamento

Item	Reais (R$)
Material bibliográfico:	
Revistas, livros	1.000,00
Pesquisa bibliográfica eletrônica	300,00
Sub total	**1.300,00**
TOTAL CAPITAL	**3.350,00**
BOLSAS:	
2 bolsas de Iniciação científica	5.784,00
TOTAL BOLSAS	**5.784,00**
TOTAL DO PROJETO	**60.000,00**

Universidade Federal de Pelotas
Departamento de Medicina Social
Programa de Pós-graduação em Epidemiologia

Trabalho Infantil,

Educação e Saúde

Relatório do Trabalho de Campo

Anaclaudia Gastal Fassa

Pelotas, julho de 2000

SELEÇÃO E TREINAMENTO DE ENTREVISTADORES

A partir de uma ampla divulgação nas Universidades Federal e Católica de Pelotas recebeu-se inscrições de candidatos a entrevistadores. Estes candidatos preencheram uma ficha mencionando o curso que estavam frequentando, experiência anterior em atividades de pesquisa, motivo para estar se candidatando a este trabalho, disponibilidade de tempo para o trabalho de campo e domínio de informática entre outras questões.

Após realizou-se entrevista para avaliar a habilidade de comunicação dos candidatos.

Foram selecionados 24 entrevistadores estudantes de medicina e enfermagem da Universidade Federal de Pelotas. A maioria não tinha experiência anterior em pesquisa. Três entrevistadoras já faziam parte do Núcleo de Saúde do Trabalhador e tinham experiência em trabalhos de campo anteriores. Estas alunas desempenharam o papel de monitoras no treinamento dos novos entrevistadores.

O treinamento dos entrevistadores realizou-se no período de 12 a 16 de janeiro de 1998 e desenvolveu-se em três etapas: leitura do questionário e manual de instruções, dramatização da entrevista com abordagem de situações problema e entrevistas acompanhadas.

PREPARAÇÃO DO TRABALHO DE CAMPO

Identificou-se junto ao IBGE (Instituto Brasileiro de Geografia e Esstatística) os 70 setores de baixa renda da cidade de Pelotas, ou seja, setores em que menos de 1,5% dos chefes de família ganham mais do que 20 salários mínimos por mês.

Destes 70 setores sorteou-se 22 para a realização do trabalho de campo. Marcou-se todos os setores em um mapa grande. Obteve-se de diversas fontes, IBGE, guia telefônico, mapas detalhados de cada setor sorteado.

Distribuiu-se um setor para cada 2 entrevistadores. Segundo o IBGE cada setor deveria ter entre 200 e 300 famílias, porém como na prática alguns setores apresentavam tamanho bastante diferenciado, os setores acabaram sendo redivididos de acordo com o andamento do trabalho de campo.

O material do entrevistador constava de pasta, vales-transporte, questionário, manual de instruções, folha de conglomerado, planilha de controle do trabalho de campo, mapa do setor, prancheta, lápis, papel, borracha, apontador e crachá de identificação.

AMOSTRAGEM

A relação expostos/não expostos de 9:1 estimada no projeto referia-se a comparação entre trabalhadores e não trabalhadores. No entanto, foi preciso avaliar o impacto de diferentes atividades produtivas sobre problemas músculo-esqueléticos. Isto resultou em uma relação expostos/não expostos de 89:1(1864 não trabalhadores e 21 trabalhadores da manufatura). No entanto a prevalência da doença nos não expostos (dor nas costas) foi de 41%. Deste modo foi possível detectar com um nível de confiança de 95% e poder estatístico de 80% um risco relativo de 1.8.

ESTUDO PILOTO

O estudo piloto foi realizado em 2 dos setores sorteados. Cada entrevistador realizou 5 entrevistas, toalizando 120 entrevistas no período de 16 à 18 de janeiro. Pelo menos uma das entrevistas deveria ser realizada com uma criança trabalhadora. Os entrevistadores discutiram com a coordenação da equipe as dificuldades encontradas refinando o treinamento. As entrevistas do estudo piloto serviram também para corrigir problemas no questionário, melhorar o manual de instruções, as folhas de conglomerado e as planilhas de controle do trabalho de campo. Estas entrevistas não foram incluídas na amostra do estudo.

TRABALHO DE CAMPO

O trabalho de campo desenvolveu-se no período de 21 de janeiro à 15 de junho de 1998. Em cada domicílio a mãe ou sua substituta respondia o questionário familiar e um questionário comportamental para cada criança na faixa etária em estudo, enquanto que cada criança respondia ao questionário infantil. Como não se sabia previamente o número de crianças residentes em cada domicílio, os questionários familiares eram numerados previamente e os questionários comportamentais e infantis eram numerados no momento da entrevista de forma a poder identificar a que família pertencia cada criança. Como, em cada domicílio, várias pessoas deviam ser entrevistadas, foi necessário um controle minucioso do trabalho de campo para garantir que fossem aplicados todos os questionários necessários. A folha de conglomerados foi muito importante para que houvesse controle dos domicílios que não tinham crianças na faixa etária em estudo.

Um supervisor do trabalho de campo reunia-se semanalmente com cada entrevistador para receber os questionários prontos, observando seu completo preenchimento, discutindo dúvidas e anotando o número e o tipo de questionário realizado. Ele também revisava as folhas de conglomerado e a planilha de controle de trabalho de campo. Também semanalmente realizava-se uma reunião de todos os entrevistadores com os coordenadores e supervisores do estudo para discutir o andamento geral do trabalho de campo.

Paralelamente ao trabalho de campo, 3 auxiliares de pesquisa realizaram uma primeira revisão dos questionários examinando se todas as questões estavam respondidas, se as questões fechadas haviam sido corretamente codificadas e se as respostas eram consistentes. Questionários com problemas eram avaliados pelos coordenadores do estudo para definir se o entrevistador deveria retornar ao domicílio para sanar o problema ou se outro tipo de encaminhamento seria recomendado.

O controle de qualidade foi realizado por 2 supervisores paralelamente ao trabalho de campo. A cada semana, 5% dos questionários de cada entrevistador eram sorteados e parcialmente refeitos. A partir do domicilio com criança sorteado o supervisor examinava se as próximas 10 casas a esquerda haviam sido corretamente registradas na folha de conglomerados. Além disso, a próxima casa que constasse na folha de conglomerados como não tendo crianças era revisitada para confirmar esta informação. Não foi constatado nenhuma fraude nas entrevistas realizadas.

POPULAÇÃO ESTUDADA E PERDAS

Foram estudadas 4.924 crianças entre 6 e 17 anos. Estimou-se que houve uma perda de 7,6% de questionários infantis. Foram identificadas três situações em relação as perdas: domicílios em que alguma(s) da(s) criança(s) não tinha(m) sido entrevistada(s), neste caso o número de perdas em cada domicílio era conhecido; domicílios em que ninguém havia sido entrevistado mas que o número de crianças na faixa etária em estudo era conhecido e domicílios em que ninguém havia sido entrevistado e que o número de crianças na faixa etária em estudo era desconhecido. Para estimar as perdas nos domicílios em que o número de crianças era desconhecido aplicou-se a média de crianças por domicílio encontrada no estudo. A perda total foi calculada somando-se a estas o número de crianças nas outras duas situações.

CODIFICAÇÃO, ENTRADA E EDIÇÃO DE DADOS

Os entrevistadores realizaram a codificação das questões fechadas do questionário. Algumas questões abertas da parte de trabalho como por exemplo tipo de ocupação foram codificadas a partir de listagens de ocupação previamente estabelecidas.

A maior parte das questões abertas, no entanto, foram tabuladas e posteriormente codificadas. Questões complexas como as questões abertas referentes a parte de trabalho foram codificadas por 2 codificadores especialmente treinados.

A codificação dos questionários passou por 2 revisores.

Os questionários foram, duas vezes, digitados no pacote estatístico EPI-INFO. Realizou-se a comparação das duas digitações identificando os problemas e corrigindo uma delas. Após, o banco de dados foi traduzido para o pacote estatístico SPSS/PC+.

ANÁLISE DE DADOS

A análise de consistência foi realizada no programa SPSS. Primeiramente realizou-se uma frequência simples de todas as variáveis identificando falhas. Como o questionário constava de muitas perguntas interrelacionadas e muitos “pulos” realizou-se também análises bivariadas para diagnosticar respostas incongruentes.

A análise de dados constou da descrição do perfil ocupacional realizada através de análises univariadas e bivariadas, bem como, análises estratificadas. A avaliação da associação entre tipo de trabalho e problemas músculo-esqueléticos foi realizada através de análise univariada e bivariada. Realizou-se também regressão logística e regressão de Poisson ajustando para fatores de confusão e mediadores. Também foi desenvolvido o diagnóstico da regressão logística.

Os pacotes estatísticos utilizados na análise de dados foram SPSS/PC+ e Stata.

AVALIAÇÃO DOS OBJETIVOS DO PROJETO

No que se refere aos objetivos relacionados a esta dissertação de doutorado cabe destacar que a revisão bibliográfica foi exaustiva, porém foi muito facilitada pelo acesso a Countway Library da Harvard School of Public Health. O material reunido extrapola os assuntos enfocados no projeto, incluindo materiais educativos e de intervenção relacionados a possíveis desdobramentos do estudo.

O perfil ocupacional foi bastante detalhado contribuindo para uma área do conhecimento na qual existe extrema escassez de informações. A análise das associações entre tipo de trabalho e problemas músculo-esqueléticos cobre um assunto que ainda não foi estudado e aponta sua relevância em termos de saúde pública. Apresenta uma importante limitação no que se refere a direcionalidade da associação visto que examina a relação entre trabalho atual e problema músculo-esquelético no ano anterior a entrevista.

Em relação ao projeto como um todo, é importante mencionar que outras análises estão sendo realizadas. Já encontra-se disponível uma análise sobre a contribuição econômica das crianças trabalhadoras para suas famílias e para o município, assunto este que tem gerado muito interesse tanto no âmbito nacional como internacional. Futuras análises enfocarão outros objetivos do projeto.

Além disso, o estudo foi o principal motivador para que a cidade de Pelotas estivesse entre as primeiras cidades escolhidas para a implantação do Programa de Erradicação do Trabalho Infantil (PETI). Os resultados do estudo estão subsidiando o delineamento e execução do PETI em Pelotas e no estado do Rio Grande do Sul. Os autores do projeto estão participando das Comissões Municipal e Estadual de Erradicação do Trabalho Infantil procurando colocar o conhecimento gerado pelo estudo ao alcance daqueles que definem as políticas de proteção da criança e do adolescente.

Universidade Federal de Pelotas
Departamento de Medicina Social
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Trabalho Infantil,

Educação e Saúde

Anexo 1 - Questionários

Anaclaudia Gastal Fassa

Pelotas, julho de 2000