ABSTRACT
Objective: evaluating the ability to work among rural workers cutting sugar cane of an alcohol and cane mill.
Method: an epidemiological study with 400 rural workers, using the Index of the Work Ability (ICT). The data were tabbed with the aid of Microsoft Excel 2007 for the ICT. The research project was approved by the Research Ethics Committee, under Opinion n. 607/2010. Results: the average amount showed in the Work Ability Index was of 29,8 points; diseases referred with a diagnosis of higher frequency were: musculoskeletal, respiratory, dermal and digestive disease; the moderate ability to work was related to the physical requirements of this work and the number of musculoskeletal disorders with a medical diagnosis. Conclusion: The implementation of health promotion programs in the workplace is a key aspect to improve and restore the ability to work, and thus, prevent premature aging, and consequently, loss of ability to work.

Descriptors: Evaluation of Work Capacity; Rural Worker; Occupational Health.

RESUMO
Objetivo: avaliar a capacidade para o trabalho entre trabalhadores rurais de corte de cana-de-açúcar de uma usina sulcroalcooleira. Método: estudo epidemiológico, com 400 trabalhadores rurais, utilizando-se o Índice de Capacidade para o Trabalho (ICT). Os dados foram tabulados com o auxílio do programa Microsoft Excel 2007 para o ICT. O projeto de pesquisa foi aprovado pelo Comitê de Ética em Pesquisa, sob o parecer nº 607/2010. Resultados: o valor médio apresentado no Índice de Capacidade para o Trabalho foi de 29,8 pontos; as doenças referidas com diagnóstico médico de maior frequência foram doença musculoesquelética, respiratória, digestória e dérmica; a capacidade para o trabalho moderada esteve relacionada com as exigências físicas desse trabalho e o número de doenças musculoesqueléticas com diagnóstico médico. Conclusão: a implementação de programas de promoção da saúde no ambiente de trabalho é um dos aspectos fundamentais para melhorar e restaurar a capacidade para o trabalho, e assim, prevenir o envelhecimento precoce, e consequentemente, a perda da capacidade para o trabalho. Descriptores: Avaliação da Capacidade de Trabalho; Trabalhador Rural; Saúde do Trabalhador.

RESUMEN
Objetivo: evaluar la capacidad de trabajo de los trabajadores rurales que cortan la caña de azúcar de una fábrica sulcroalcooleira. Método: estudio epidemiológico con 400 trabajadores rurales, a través del Índice de Capacidad para el Trabajo (ICT). Se tabularon los datos con la ayuda del Microsoft Excel 2007 para el ICT. El proyecto de investigación fue aprobado por el Comité de Ética de Investigación, Opinión n° 607/2010. Resultados: la cantidad media que aparece en el Índice de Capacidad para el Trabajo fue de 29,8 puntos; las enfermedades mencionadas con un diagnóstico de mayor frecuencia fueron: musculo esquelético, respiratorio, dérmico y las enfermedades digestivas, la capacidad moderada para el trabajo se relaciona con los requisitos físicos de este trabajo y el número de trastornos musculo esqueléticos con un diagnóstico médico. Conclusion: a implementación de programas de promoción de la salud en el lugar de trabajo es un aspecto clave para mejorar y restaurar la capacidad de trabajo, y por lo tanto, prevenir el envejecimiento prematuro, y en consecuencia, la pérdida de la capacidad para el trabajo. Descriptores: Evaluación de la Capacidad de Trabajo; Trabajador Rural; Salud Ocupacional.
INTRODUCTION

The alcohol and sugarcane industry in Brazil stands out as one of the main economic sectors by large domestic market share. In this regard, some data show that the production of sugar and ethanol in the country was 31.049.206 tons and 27.512.962 liters in the period between 2008 and 2009. Furthermore, sugar and alcohol are a major Brazilian export products, and generation of employment and income. Mills and distilleries employ approximately one million Brazilians. It is noteworthy that in the harvesting of sugar cane are considered of great importance, due to the number of workers involved and the physical stress resulting from this activity.

Workers responsible for harvesting sugar cane, both manual and mechanized, are exposed to daily weather changes and a workplace that presents various risk situations, involving the workloads of physical nature (sunlight, wind, rain, extreme temperatures, noise and vibration), chemical (dust, soot, pesticides), biological (venomous animals), mechanical (injury, fire hazard), ergonomic (poor posture, repetitive movements, night shifts, shift alternation) and mental (injuries, concentration, monotony and repetitiveness). The International Labor Organization - ILO states that rural labor is significantly more dangerous than other activities. A study of manual workers harvesting of cane sugar shows that there is considerable work-related health problems, such as accidents, respiratory, musculoskeletal and circulatory.

The interest in conducting the study came up the need to know the capacity for working among rural workers cutting cane sugar, combined with the scarcity of research conducted with these workers, as this category develops activity that can compromise the functional capacity to work, and consequently lead to premature aging and loss of ability to work.

The aging and work ability are related to changes in the age group of Brazil's population and life expectancy, coupled with the socioeconomic, political, and national social security changes, with marked social inequalities that influence aging, given the precarious deficient work and quality of life, leading workers to stay indefinitely in the labor market.

The ability to work is related to the ability of rural workers who have to do their work according to the requirements of this job, his health, and his physical and mental capabilities. The Index Capacity for Work (ICT) encompasses the self-assessment of workers and their ability to work, having a predictive character. The instrument allows the diagnosis of loss of ability to work early, so that prevention, maintenance and health promotion programs assist in employee health and must be used in Occupational Health Services. The final score of points is between 7 and 49 points and reports the own concept of the worker on his ability to work.

The studies on the ability to work within the worker's health began in the '90s, amid the backdrop of demographic change and the relations of production and work. Research on Aging and the Work Ability Index and the Work Ability (ICT) have been developed in Finland, the group of workers of the Institute of Occupational Health (FIOH). In Brazil, the aging of the workforce began occur from the '80s and studies on the subject began after the translation and adaptation of the Questionnaire Index Capacity for Work (ICT) into Portuguese, which occurred in 1997.

Given the above, the objective of this study is:

- Assess the ability to work among rural workers cutting sugar cane of an alcohol and cane mill.

METHOD

This is an epidemiological study referred as transverse or prevalence study conducted in a sugar and alcohol mill in the State of São Paulo. The company has 2.355 employees. During the harvest period between 2010 and 2011, sugar production was 141.908 tons, while ethanol was 79.293.182 liters. The Department of Human Resources, said the plant was previously contacted in order to explain about the goals - presentation, mention the interest of research, explaining the reasons for the research, justification, assurance of anonymity of the interview and conversation starter.

The choice of the population was random, according to the inclusion criteria, namely, acceptance and age above 18 years old, as has the age limit for entry into mills. 400 rural workers cutting sugar cane were interviewed.

It was used the Ability Index Questionnaire for Work - ICT, as well as another instrument with socio-demographic data. The ICT assesses seven dimensions: capacity for the current job compared with the best of life, work ability in relation to job requirements, number of physician-diagnosed diseases, estimated work due to illness, absence from loss work due to illness, own prognosis of work...
ability and mental resources. The ICT score is distributed as follows:

<table>
<thead>
<tr>
<th>Score</th>
<th>Ability to work</th>
<th>Objectives of the measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 - 27</td>
<td>Low</td>
<td>Restore the ability to work</td>
</tr>
<tr>
<td>28 - 36</td>
<td>Moderate</td>
<td>Improve the ability to work</td>
</tr>
<tr>
<td>37 - 43</td>
<td>Good</td>
<td>Improve the ability to work</td>
</tr>
<tr>
<td>44 - 49</td>
<td>Excellent</td>
<td>Keeping the ability to work</td>
</tr>
</tbody>
</table>

Due to the difficulties presented by the participants during the implementation of the instruments, were interviewed individually and separately. The interviews took place from September to November 2010, covering the day shift.

The research project was approved by the Ethics and Research Merit Committee, as opinion n. 607/2010. It was used the term of free and informed consent, which ensured the research subjects and the confidentiality that non participation would not cause any loss in relation to their work.

The data were tabbed with the aid of Microsoft Excel 2007 program for the ICT and studied variables. Frequency tables were used for categorical variables (for example, sex and marital status), descriptive statistics (such as measures of dispersion and position), the continuous variables (e.g., age and number of diseases), to describe the profile of the research subjects and the confidentiality that the data will be presented in a simple way, starting with the first part of the instrument and, in a complex way, represented by the correlations of the variables considered most important.

Table 1 shows the distribution of the population according to socio-demographic variables. Observing a large number of male workers (95,3%), the most frequent age group was 25-34 years old (41,3%) with a mean age of 29,8 and median of 27,4; 1,0% of the population were single, 90,5% of workers worked from one to five years in the company, with a mean of 2,9 years with a standard deviation of 2,5 and a median of 2,0 years; considering the function, was explored the rural workers cutting sugar cane, for a total of 100,0% of the population, 100,0% conducted their work during daytime and 100,0% did not develop any leadership position.

The workers were asked about their ability for the present work in relation to their work. It was observed that 75,0% (n = 300) considered their work ability in relation to mental demands as very good/good, 24,3% (n = 97) moderate. There were highlighted two accounts on their ability to present work in relation to poor physical demands and a very bad report.

When asked about their ability to work in relation to mental requirements, 89,8% (n = 359) of the subjects reported as very good/good, 9,5% (n = 38) moderate. Only two workers considered their ability in relation to mental demands of work bad.

The workers were asked about the number of whole days off work due to illness, medical
appointments or exams. It was observed that 30% (n = 122) subjects reported no day absent, 64,0% (n = 256) from 1 to 15 days, and 3,0% (n = 12) from 16 to 24 days, 2,3% (n = 9) from 25 to 99 days, and only one report 100-365 days. The average number of certificates was 2,5 days with 3,0 standard deviation and median 2,0. These absences were confirmed with certificates delivered to the department of occupational medicine of the Mill.

The relationship between ICT and the studied variables will be presented in the following tables.

Table 2 shows the distribution of rural workers cutting sugar cane by age group related to the ICT score. The low/moderate category of ICT were more frequent in the age group 25-34 years old, with 41,3% (n = 164), followed by 15-24 years old, with 35,5% (n = 141) and 35-44 years old with 13,9% (n = 55). The age group 35-44 years old showed good ICT with 66,7% (n = 2) of the population, followed by 25 to 34 years old with 33,3% (n = 1). It was observed that 99,3% of the population had low/moderate ICT and 0,7% good.

Table 3 shows the relationship of the type of self-reported illness with ICT. It was found that the highest frequency of musculoskeletal disease was 46,4% (n = 199), which workers had low/ moderate ICT, 31,5% (n = 135) self-reported respiratory disease presenting with low ICT/moderate, 10,5% (n = 45) self-reported presenting Digestive disease, all with low/moderate WAI. Noteworthy are three workers showed that good ICT, each presenting a self-reported, gastrointestinal (n = 1), dermal (n = 1) neurological diseases (n = 1).

It was observed in Table 4 that of 46,5% (n = 72) of those with low/moderate ICT reported musculoskeletal disease with medical diagnosis, 34,2% (n = 53) reported respiratory illness with a medical diagnosis. In addition, workers (n = 3) showed good ICT mentioned submit diseases: neurological, digestive and skin, each one with a response with medical diagnosis.

<table>
<thead>
<tr>
<th>Index of Ability to work</th>
<th>15 - 25</th>
<th>25 - 35</th>
<th>35 - 45</th>
<th>45 - e +</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low/Moderate</td>
<td>141</td>
<td>164</td>
<td>55</td>
<td>37</td>
<td>432</td>
</tr>
<tr>
<td>Good</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>141</td>
<td>165</td>
<td>57</td>
<td>37</td>
<td>432</td>
</tr>
</tbody>
</table>

The relationship gender and the Work Ability Index (ICT) of rural workers showed that 4,5% (n = 18) were women, with ICT in low/moderate categories, and only one worker had good ICT. In males 95,5% (n = 379) of the population had low/moderate ICT, and only two subjects with good ICT.

Regarding the educational level and the Index Capacity for Work (ICT) of the population studied, it was observed that 69,0% (n = 275) had incomplete primary education, less than 8 years of schooling, 14,4% (n = 57) complete primary education and 8,3% (n = 33) with incomplete and complete secondary education, being that all workers had low/moderate ICT. It is noteworthy that three subjects with good ICT had an incomplete primary education.

It was observed in Table 4 that of 46,5% (n = 72) of those with low/moderate ICT reported musculoskeletal disease with medical diagnosis, 34,2% (n = 53) reported respiratory illness with a medical diagnosis. In addition, workers (n = 3) showed good ICT mentioned submit diseases: neurological, digestive and skin, each one with a response with medical diagnosis.

<table>
<thead>
<tr>
<th>Kinds of diseases-own opinion</th>
<th>Musculoskeletal System</th>
<th>Cardiovascular System</th>
<th>Respiratory System</th>
<th>Neurological System</th>
<th>Digestive System</th>
<th>Genitourinary system</th>
<th>Dermal System</th>
<th>Hematological System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low/Moderate</td>
<td>199</td>
<td>4</td>
<td>135</td>
<td>21</td>
<td>45</td>
<td>9</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>Good</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>199</td>
<td>4</td>
<td>135</td>
<td>21</td>
<td>45</td>
<td>9</td>
<td>15</td>
<td>1</td>
</tr>
</tbody>
</table>

| Total                          | 100,0                 | 100,0                 | 100,0             | 100,0             | 100,0             | 100,0                | 100,0         | 100,0               |

English/Portuguese
J Nurs UFPE on line., Recife, 8(2):294-302, Feb., 2014
Table 4. Distribution of rural workers of a Mill in the State of São Paulo, according to the relationship of the kinds of diseases referred to with diagnosis and the index of ability for the job. Araras, 2011.

<table>
<thead>
<tr>
<th>Type of Disease-Diagnosis</th>
<th>Low/ Moderate</th>
<th>Good</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sistema Musculo-esquelético</td>
<td>72</td>
<td>46.5</td>
<td>72</td>
</tr>
<tr>
<td>Cardiovascular System</td>
<td>3</td>
<td>1.9</td>
<td>3</td>
</tr>
<tr>
<td>Respiratory System</td>
<td>53</td>
<td>34.2</td>
<td>53</td>
</tr>
<tr>
<td>Neurological System</td>
<td>26</td>
<td>3.9</td>
<td>26</td>
</tr>
<tr>
<td>Digestive System</td>
<td>11</td>
<td>7.1</td>
<td>11</td>
</tr>
<tr>
<td>Genitourinary system</td>
<td>3</td>
<td>1.9</td>
<td>3</td>
</tr>
<tr>
<td>Dermal System</td>
<td>7</td>
<td>4.5</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>155</td>
<td>100.0</td>
<td>155</td>
</tr>
</tbody>
</table>

Table 5 shows the relative capacity of the current work and age. It was observed that 38.5% (n = 154) of the workers reported the maximum value 26.0% (n = 104) are with the current capacity to work. The highlights were two cases of workers with the ability to work 1, 2 and 4.

Table 5. Distribution of rural workers of a Mill in the State of São Paulo, according to capacity ratio for the current job and age group. Araras, 2011.

<table>
<thead>
<tr>
<th>Index of Ability to work</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15-24</td>
</tr>
<tr>
<td>Capacity for the current job</td>
<td>n</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>46</td>
</tr>
<tr>
<td>9</td>
<td>24</td>
</tr>
<tr>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>142</td>
</tr>
</tbody>
</table>

DISCUSSION

The socio-demographic data showed specific characteristics of the study population. These findings of gender, age, educational level, are in agreement with other studies, in which most of the workers were male, had less than 40 years and low educational attainment. In a study of truckers researchers found that the majority of workers were male, had more than 40 years of age and educational level was below eight years of study. The low education presented by rural workers cutting cane sugar is related to the function, it shows that there is no requirement for high levels of studies to hold office.

In research conducted with workers in the agricultural sector, specifically with machine operators 15 revealed that the population was predominantly male, being comprised of young workers. The educational level of this population has not substantiated this study. As working time, 90.5% of subjects worked 1-5 years in the company, and all subjects were involved in the function of cutting cane sugar, and exercised no leadership position. The findings are in agreement with a study that showed the greatest percentage of individuals working 1-5 years at the company, in the same occupation. The agricultural sector has a turnover of pretty important workers in relation to working time in the same company.

Another study showed that age had a strong correlation with the length of service in the company, being a variable that represent exposure to the demands of work over the life of the worker. The median age was 27 years old, with age ranging from 18 to 44. It was observed in all age groups, more often than low/moderate ICT. It was found that age was associated with the loss of early work ability.

Some studies have investigated the association of age with early loss of ability to work corroboring the results obtained in this research. Some researchers have found that age is associated with the working ability, in which these studies differ with the findings presented here. It was observed that 95.5% of the study population were men and 4.5% women, and all these subjects had moderate and low ICT. The highlights were three subjects with good ICT, in which two subjects were men and one woman.

Researchers found that from workers of cleaning and hygiene, 85.5% men and 41.4% women were in the moderate and low categories, corroboring the data of this research. The relationship of the findings of this research with the present study supports the need for physical demand of workers cutting sugar cane and those of hygiene and cleanliness.
Regarding the level of education and ICT, it was observed that the majority of rural workers cutting sugar cane had incomplete primary education with ICT in moderate and low categories. Data on work ability among workers showed that 98.8% of the subjects had the ability to work in low and moderate categories. Therefore, it was important to consider that these workers had the predominant physical demands of their work.

The data are very significant, which corroborate with some researchers found that 46.4% of workers cleaning and hygiene exhibited the ability to work in low and moderate categories.\(^1\) The results of the present study did not identify workers with great capacity for work and only 0.8% of rural workers cutting cane sugar showed good ability. From this, it is necessary to implement measures to promote health in the workplace to improve and restore the ability to work. The observed is in disagreement with other authors, who found the ability to work in the great and good categories.\(^1,10,13,15,19,20\)

It is emphasized that this population has predominance in the demands of the physical demands of their work. These findings are similar to other authors.\(^1,15\) In addition, other researchers have observed decreased\(^2\) to work over the years, through the organization and work environment capacity. It was found that 82.0% of the population had decreased capacity for work and only increased 13.6% in the period 1982-1991. Regarding mental demands at work, 89.8% of rural workers cutting sugar cane in the categories presented as very good or good. Although the workers had the physical demands at work, this result showed that work ability in relation to mental demands was not impaired.

Another important factor are the diseases those constitute medical diagnostic score in ICT, moreover, there are associated with the ability to work. Regarding self-reported diseases there were the predominant group of the musculoskeletal, followed by genitourinary, cardiovascular and hematological respiratory diseases, digestives, neurological, dermal. Emphasis was placed on three subjects, each of which presents a self-reported disease: neurological, skin and digestive.

It is noteworthy that 31.3% of the study population had respiratory diseases, possibly by the association for the winter season and also the relative humidity below normal during the harvest period. Researchers\(^19\) conducted a study with workers cleaning service at a university hospital, in which subjects showed prevalence of musculoskeletal disorders, followed by cardiovascular, respiratory and emotional.

The predominant group of diseases with a diagnosis of musculoskeletal diseases was then respiratory cardiovascular genitourinary diseases, digestives, dermal, and neurological. It was noted that three workers had a disease diagnosed each, as follows: neurological, digestive and skin. Musculoskeletal diseases, followed by mild emotional, were found in a study\(^10\) with electric utility workers.

The prevalence of musculoskeletal diseases was possibly related to the type of work performed by this population due to the physical demands of manual labor in the harvesting of cane sugar. The symptoms of these diseases require solution in the medium and long term which provides difficulties in the development of industrial activities and work overloads. This scenario can lead to decreased productivity of rural workers, resulting in decline in their quality of life.\(^22\)

The prevalent musculoskeletal and cardiovascular diseases in a group of Finnish workers corroborate this study. All workers performing physical demands throughout this study had some type of disease, and to respond on health, noticed how bad.\(^9\)

In a study of nursing staff, researchers\(^13\) found the following self-reported diseases and those with medical diagnosis: diseases of the musculoskeletal, cardiovascular, respiratory, neurological and sensory systems. It was found in this study the association between diseases and work ability. These findings corroborate the present study. Studies with prevalence of cardiovascular, metabolic and neurological diseases in workers truck drivers were found.\(^14,24\)

Another relevant factor is the assessment of daily activities and active and alert feeling. It was noted that there were discrepancies in the responses of workers; the majority reported that they have always enjoyed the daily activities and always felt active and alert, all of which showed moderate and low ICT.

It was observed in the ratio of current work ability and age, that workers assigned the values 2, 4, 5, 6, 7, 8, 9 and 10, and all subjects aged 24 and 35 years were distributed in the following ways: 0.6% with value 2, 0.6% with value 4, 3.7%, or 5, 4.9%, 6 value, 5.6%, value 7; 22.2%, a figure 8, 17.3%, 9 value, 45.1%, value 10.

It was found that these young workers who presented the current capacity for work have low negative prognosis would not pursue the work cutting sugar cane in two years. As attested by the number of missed work,
medical appointments or exams the last two years, we observed relative loss of early work ability, for 122 (30.7%) of workers said they had not been absent during the period and were classified with moderate and low ICT.

CONCLUSION

The study evaluated the ability to work among rural workers cutting sugar cane. The results showed that the relatively young population is getting sick, moreover, it is already showing signs and symptoms of early loss of work ability. It has been found that the ability to work moderately was related to the physical demands of this work and the number of musculoskeletal diseases in medical diagnosis.

It is necessary to implement health promotion programs to improve work capacity, and prevention of work-related diseases, focusing on improvements in the workplace, in personal and professional satisfaction and quality of life of the worker. The program of health promotion in the workplace is a key aspect to improve and restore the ability to work, and thus, prevent premature aging, and consequently, loss of ability to work. We suggest activities such as employment and functional fitness, sporting, recreational and gymkhanas for workers and their families, for enhancing the health, guidance on ergonomic aspects, aimed at encouraging changes in attitudes, habits and healthy behaviors decreased risk.

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