INTRODUCTION
Accurate observations of occupational activities are necessary to monitor health and safety compliance and to identify the interventions that are most needed (Pransky et al., 1999). With rapid advances in technology, employees are now increasingly subjected to the exposure of more dangerous newly developed machinery and undue psychological stressors (Furlow, 2002). Several studies (Bentley et al., 2005; Laurence, 2005; Shrader-Frechette and Cooke, 2004) have indicated that these advances have resulted in many companies facing an increasing number of health and safety violations amongst the workforce. Some of these violations include a lack of personal protective equipment, using incorrect hand postures and the improper use of machinery (Torp et al., 2005; Wilson, 2005), amongst others. There is still little liaison by physiotherapists with other health related professionals, poor formal risk assessments measuring health and safety compliance and poor integration of relevant role players into the management of health and safety violations (Ehrens, 2001). As physiotherapists have a pivotal role to play in occupational health and ergonomics this lack of interdisciplinary intervention will impact poorly on the workers health.

The company under investigation was an alcohol beverage manufacturing company. The medical service co-ordinator is responsible for the implementation and control of the occupational health facet. The aims are to identify those processes, chemical substances or types of work that could negatively impact on a workers’ health and to eliminate, minimise or control the hazard. The occupational health programme at this company is compliant with the extent of the Occupation Health and Safety Act of 1993 that requires occupational health risk areas, jobs, processes, hazardous substances etc., to be identified, assessed, quantified and appropriate measures to be developed and implemented. The identification and assessment of occupational health risks are carried out via the Risk Management Programme (RMP). Consultants are used from time to time to assess the risk or to assist the company in setting up the methodology so that occupational health personnel can carry out the necessary tasks to assess the injury.

Although this company is committed in its moral and legal obligations to ensuring a working environment that is safe and free from hazards [personal communication], the extent of compliance of employees regarding health and safety regulations has not been established at this specific company.

The purpose of this present study was therefore to monitor the compliance of employees regarding health and safety regulations by observing their activities and noting how many and what violations took place over that period of time.

METHODS
This study received ethical clearance from the University of Cape Town.

ABSTRACT: This observational study was undertaken to identify the health and safety violations of employees at a specific beverage manufacturing company. A site inspection and observation of all employees employed at this specific beverage company was conducted by the researcher over 2 days. Employees were observed for 12 hours per day with the morning shift on Day 1 and the afternoon shift on Day 2. A sample of convenience was used in that every employee who was present on those days was included. Descriptive statistics were used to analyze the data set. There were a total of 212 employees and 332 behaviours observed during this study period. Unsafe handling and behaviour was observed in 55% of observations. Incorrect manual lifting techniques was the most frequent health and safety violation observed. In the 48 manual lifting behaviours observed, correct practice was observed in only three cases. It is clear that more healthcare education and practical training is required in the area of manual lifting techniques. It is clear that more practical training is required in the area of manual handling.

KEYWORDS: OCCUPATIONAL HEALTH AND SAFETY, BEVERAGE EMPLOYEES, SITE INSPECTION, OBSERVATION, COMPLIANCE.
Ethics Committee. To ensure that workers were committed to taking part in the study, permission to conduct this study was obtained from both senior management and the employees’ union representatives at this specific beverage company. Although employees were informed that they will be observed for the purpose of this study, they were not informed of the actual dates of observation in order to prevent them from performing better simply because they are being watched.

A site inspection and observation of all employees employed at this specific beverage manufacturing company was conducted by the researcher over 2 non-consecutive days. Employees were observed for 12 hours per day with the morning shift on Day 1 and the afternoon shift on Day 2. A sample of convenience was used in that every employee who was present on those days was included.

Employees were monitored for their compliance with health and safety protocols and procedures. The researcher used a checklist which was based on the General Safety Rules and Guidelines section of the health, safety and risk control manual at this specific company. Face validity was assumed as the checklist was based on the occupational health, safety and risk training manual utilised by the company. Content validity of the checklist was addressed as input from experts in physiotherapy research and occupational health were consulted to scrutinise a draft copy. This checklist was used to note how many and what health and safety violations took place over that period. This was calculated as the number of violations per employee present at the time. This checklist included 10 main categories and 34 sub-categories. The data from the checklist was reduced to percentages and analysed descriptively using the Statistica 7 package. The level of significance was set at 0.05.

RESULTS

There were a total of 212 employees and 332 behaviours observed during this study period. Table 1 lists the number of times tasks were observed and whether or not they were correctly performed. It can be seen that in 55.4% of cases standard procedure was not followed.

**Good Housekeeping**

Eighty health and safety behaviours (24.1% of total) were observed for this task. Of these, on twenty-five occasions (31.3%) employees were observed to have correctly placed their waste and general rubbish in the bins provided. On ten occasions (12.5%) employees removed excessive combustibles from the working area. On twenty-six occasions (32.5%) employees were observed to have stored items in the incorrect boxes/lockers and on two occasions (2.5%) employees were observed to have inadequately cleaned spilled chemicals on the floor.

**Stacking and Storage**

Thirty-three health and safety behaviours (9.9% of total) were observed for this task. In response to this task, it was noted on seven occasions (21.2%) that employees correctly stored dangerous goods. On fourteen occasions (14.2%) it was noted that employees correctly kept roadways between the stacks clear. A site inspection of the workshop floor revealed that on four occasions (1.2%) the fire and electrical equipment was stored within easy access.

**Walkways**

Twenty-six health and safety behaviours (7.8% of total) were observed for this task. On fourteen occasions (53.8%) employees were observed to have correctly followed the demarcated walkways throughout the depot. On further inspection, it was observed that three walkways were obstructed with working tools. However, of the five employees that used these walkways, only four employees removed the working tools that obstructed these walkways.

**Fire Protection, Prevention and Emergency Response**

Thirty-seven health and safety behaviours (11.8% of total) were observed for this task and then employees were questioned in order to elicit a response on the knowledge of fire safety. It was noted that four employees (10.8%) knew the correct type of fire extinguishers to use, five employees (16.5%) could adequately identify the location of all fire extinguishers and six employees (1.8%) knew how to correctly mount the fire extinguishers. However, on thirteen occasions (31.1%) employees were observed not to have correctly followed the symbols/signs demarcating danger when they entered dangerous work zones.

**Safety Devices (SDs) and Personal Protective Equipment (PPE)**

Thirty-seven health and safety behaviours (11.1% of total) were observed for this task. Employees were observed on four occasions (10.8%) to have incorrectly stored SDs. On ten occasions (27%) employees were observed not to have issued the correct SD and/or any PPE when required. On only one occasion (2.7%) did a employee seek permission prior to tampering with or removing a SD. On eight occasions (21.6%) employees were observed to have correctly used the SDs and PPE.

**Hand Tools**

Twenty-eight health and safety behaviours (8.4% of total) were observed for this task. On six occasions (14.3%) employees did not use hand tools that were in a good working condition, on four occasions (14.3%) employees did not store them in the correct toolbox, while on two occasions (7.1%) employees used the correct work-specific tools. On eleven occasions (29.3%) employees did not apply correct hand postures when using their tools.

**Work Area**

Thirteen health and safety behaviours (3.9% of total) were observed for this task. With regards to the working area, on two occasions (15.4%) employees correctly removed all obstacles, on four occasions (30.8%) employees ensured that there was good lighting while on three occasions employees worked in areas with adequate ventilation.

**Manual Lifting Techniques**

Forty-eight health and safety behaviours (14.5% of total) were observed for this task. In twenty-two cases (45.8%) employees were observed to have used a checklist which was based on the General Safety Rules and Guidelines section of the health, safety and risk control manual at this specific company. Face validity was assumed as the checklist was based on the occupational health, safety and risk training manual utilised by the company. Content validity of the checklist was addressed as input from experts in physiotherapy research and occupational health were consulted to scrutinise a draft copy. This checklist was used to note how many and what health and safety violations took place over that period. This was calculated as the number of violations per employee present at the time. This checklist included 10 main categories and 34 sub-categories. The data from the checklist was reduced to percentages and analysed descriptively using the Statistica 7 package. The level of significance was set at 0.05.

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**Manual Lifting Techniques**

Forty-eight health and safety behaviours (14.5% of total) were observed for this task. In twenty-two cases (45.8%) employees were observed to have used
incorrect manual handling techniques. In an additional 25 cases where the object was very heavy, on only three occasions (6.3%) did employees ask for additional help. On four occasions (8.3%) it was noted that employees did not seek authorization prior to using lifting equipment.

Incident Reporting
Nine health and safety behaviours (2.7% of total) were observed for this task following on occupational hand-

### Table 1: Checklist depicting the number of health and safety violations observed

<table>
<thead>
<tr>
<th>TASK</th>
<th>Behaviour observed</th>
<th>Correctly done</th>
<th>Incorrectly done</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Good Housingkeeping</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1 Waste and general rubbish placed in bins provided</td>
<td>27</td>
<td>25</td>
<td>2</td>
</tr>
<tr>
<td>1.2 Area kept free of excessive combustibles</td>
<td>13</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>1.3 Items stored in correct boxes/lockers</td>
<td>38</td>
<td>12</td>
<td>26</td>
</tr>
<tr>
<td>1.4 Chemicals spilled on floor adequately cleaned</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>2. Stacking and Storage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 Dangerous goods stored correctly</td>
<td>9</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>2.2 Roadways between stacks kept clear</td>
<td>17</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>2.3 Fire and electrical equipment easily accessible</td>
<td>7</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. Walkways</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 Following demarcated walkways throughout the depot</td>
<td>21</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>3.2 Walkways clear and unobstructed</td>
<td>5</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>4.1 Correct type of fire extinguishers for hazard</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>4.2 Adequate number of fire extinguishers</td>
<td>6</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>4.3 Fire extinguishers mounted correctly</td>
<td>6</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>4.4 Staff following symbolic signs/notices demarcating danger</td>
<td>19</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>5. Safety Devices (SD) &amp; Personal Protective Equipment (PPE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1 Safety devices correctly stored</td>
<td>7</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5.2 PPE issued (when necessary)</td>
<td>13</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>5.3 Authorised tampering or removal of safety devices</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>5.4 Defective SD and PPE reported to supervisor</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>5.5 Correct use of SD and PPE</td>
<td>13</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>6. Hand Tools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.1 In good condition</td>
<td>9</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>6.2 Correctly stored in toolbox</td>
<td>5</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>6.3 Work-specific tools used</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6.4 Correct hand ergonomics when using tools</td>
<td>11</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>7. Work Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1 Obstacles removed</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>7.2 Area well lit</td>
<td>5</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>7.3 Adequate ventilation</td>
<td>5</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>8. Manual Lifting Techniques</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.1 Using manual lifting techniques</td>
<td>22</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>8.2 Asking for additional help when lifting heavy objects</td>
<td>22</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td>8.3 Seeking authorisation when using lifting equipment</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>9. Incident Reporting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.1 Reporting incidents/injuries to supervisor</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>9.2 Reporting nature of incident</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>9.3 Reporting cause of injury</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>10. General Safety</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.1 Visitors given consent form to sign before entering premises</td>
<td>7</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>10.2 Staff checking visitors' temporary identification card</td>
<td>7</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>10.3 Visitors issued with PPE (when necessary)</td>
<td>7</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>332</td>
<td>148</td>
<td>184</td>
</tr>
<tr>
<td></td>
<td>(100%)</td>
<td>(44.6%)</td>
<td>(55.4%)</td>
</tr>
</tbody>
</table>
tool injury at the company. The three
employees present at the time of the
incident incorrectly reported the injury
to the supervisor, the same three
employees incorrectly reported the
nature of the injury and the same three
employees incorrectly reported the
cause of the injury.

**General Safety**

This section describes the behaviour
related to visitors at the company.
Twenty-one health and safety behaviours (6.3% of total) were observed for this
task. With regards to general safety it
was observed on seven occasions that
visitors were not given consent forms to
sign before entering the premises, while
on seven occasions it was noted that no
employee checked the temporary ident-
ification cards of these visitors and on
only two occasions were visitors given
the correct personal protective equip-
ment when required.

**DISCUSSION**

The site inspection and observation of
the working environment provided the
researcher with valuable information
about the compliance of beverage
employees regarding health and safety
regulations. Employees from all depart-
ments were observed to give a spread
of the health and safety compliance at
this specific beverage manufacturing
company. There was a high incidence
(56%) of safety violations observed in
this study, which has similarly been
reported in other studies (Afamdi, 2001;
Cherry et al., 2001; Di Lorenzo et al.,
1998; Gleeson, 2001; Hollo et al., 1993;
Li et al., 2001).

Most of the employees maintained a
clean working environment and their
specific work areas were kept relatively
clear of any obstructions. However, the
majority of employees did not return
the items used to their correct boxes/ lockers. This may have serious rever-
cussions in that the tools and spares left
about may cause other employees to
trip-and-fall (Cham and Redfern, 2001;
Englander et al., 1996; Jenson et al.,
2005) contributing to injury. Good
housekeeping is the responsibility of
every employee and a clean working
environment is indicative of a successful
health and safety programme.

Most of the employees correctly
stacked dangerous goods and kept the
roadways between these stacks clear.
This is an encouraging sign towards
health and safety compliance, as the
accumulation of dangerous goods may
block the roadways leading to potentially
hazardous obstructions. Care must also
be taken to ensure that on no occasion
should the stacks encroach onto the
roadways. Similar to other studies
(Berrios-Torres et al., 2003; Prezant et
al., 2000; Rabbits et al., 2005) most
employees did not ensure that the fire
and electrical equipment was stored
within easy access. This may be con-
sidered negligent as in the event of a fire
or electrical accident many lives could
be lost.

It was observed that the walkways at
this specific beverage company were
demarcated throughout the depots. Most
of the employees observed did follow
the demarcated signs and ensured that
these walkways were clear and unob-
structed. It is suggested that employees
also become familiar with the safest
route to and from their working station
as shortcuts can be dangerous.

Most of the employees could correctly
use and mount the fire extinguishers. It
was observed that the majority did
not follow the symbolic signs/notices
demarcating danger It is possible that
most employees did not understand the
symbolic signs/notices warning them of
potentially dangerous situations and/or
areas. It is suggested that another system
of communication be used to ensure
that employees are able to identify any
dangerous or restricted areas. A colour
coding system was mentioned in other
studies (Boul, 2000; Chervin and
Bodman, 2004; Leonelli et al., 2000) as
a means of identifying the contents of
dangerous pipelines, sharp containers,
demarcated areas etc.

The majority of employees did not
correctly store or issue PPE when
required. PPE must be issued to all
employees and visitors who are exposed
to areas in which hazards cannot be
totally removed (Galszech, 1999). In
addition, since every employee has dif-
ferent size requirements it is recom-
mended that a selection of PPE be
made available. On a more positive side,
most employees who did use SDs and/
or issued PPE were observed to have
used them correctly.

Most of the employees used hand
tools that were in a poor condition. As
with other studies (Aptel et al., 2002;
Lin et al., 2005) employees did not use
correct hand postures when using their
hand tools. Employees must ensure that
their hand tools are always in a good
working condition and correctly stored
in the toolboxes. It is recommended that
the supervisor check condition of the
hand tools on a regular basis and record
any defects in the safety file. Defective
hand tools are potential causes for acci-
dents and injuries.

The office working area was kept
relatively free of any obstacles. It was
observed that on most occasions
employees worked in areas that were
well lit and adequately ventilated. Good
ventilation and good lighting are impor-
tant to ensure the health, safety and effi-
ciency of employees.

As with other studies (Carrivick
et al., 2005; Engkvist, 2005) the majority
of employees were observed to have
used incorrect manual lifting techniques.
In addition, most employees did not ask
for additional help when lifting heavy
objects or sought authorization when
using lifting equipment. The incorrect
lifting techniques can result in excessive
strain being place on the lower back
(Glover, 2002). Occupational physio-
therapists can provide practical training
shifts on correct lifting techniques. In
addition, employees must be encouraged
to ask for additional help when lifting
heavy objects.

The majority of employees were
observed to have incorrectly reported
the cause and nature of injury to their
supervisor. It is possible that these
employees believed that the injury sus-
tained was minor and did not warrant
being fully reported. The onus is on the
employee to correctly report the injury
to the supervisor before the end of the
shift no matter how minor the injury
may seem at the time.

At this specific beverage company all
visitors are expected to pass through
Security Control (Gate 2) in order to
register their access to and from the
company. It was observed that most of the visitors were not given consent forms to sign before they entered the working premises nor were they issued with the correct PPE when required. The health and safety of visitors is the responsibility of the company, as visitors may go into unfamiliar places where they could endanger their lives. It is suggested that visitors be escorted to their destination within the company and be supplied with the correct PPE when taken into areas where such equipment is warranted.

The major limitation of the study is the lack of objective measures of unsafe behaviour and lack of compliance with safety standards. As it was an observational study, it was important that the observer be as unobtrusive as possible and the decisions as to what constituted unsafe behaviour were therefore subjective. In the absence of video-recording and peer review, these decisions are not necessarily without bias. However, as a physiotherapist is trained to visually assess movement and ergonomically correct behaviour, it is hoped that the information recorded is of an adequate standard to inform future practice within this setting.

CONCLUSION

Workers demonstrated poor adherence to safety practices with unsafe and incorrect behaviour observed in 55% of observations. Incorrect manual lifting techniques was the most frequent health and safety violation observed. In the 48 manual lifting behaviours observed, correct practice was observed in only three cases. It is clear that more health-care education and practical training is required in the area of manual lifting techniques.

With occupational health fast becoming a growing field in the physiotherapy profession, physiotherapists must respond positively to the challenge of identifying those factors that contribute to injuries in the workplace. We need to demonstrate our effectiveness in this area in order to promote quality of care and to protect and educate employees on taking a more proactive role of becoming compliant to the regulations that govern occupational health in this country. This study has clearly demonstrated the need for better education in health related work behavior, particularly in the field of kinetic handling.

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