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Assessment of Physical Workload, Ergonomic Problems and Prevalence of Pain among Low Wage Hotel Housekeepers in Orlando

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ASSSESSMENT OF PHYSICAL WORKLOAD, ERGONOMIC PROBLEMS AND PREVALENCE OF PAIN AMONG LOW WAGE HOTEL HOUSEKEEPERS IN ORLANDO

by

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ABSTRACT

This research study examined the work conditions, ergonomic problems, and prevalence of pain among low wage hotel room cleaners in Orlando. In most hotels, the cleanliness of guestrooms is one of the most important service standards expected by customers. The role of the housekeeper is thus critical to service provision and hotel profitability. The hospitality industry is a major recruiter of low wage workers with the majority working in housekeeping departments. Due to the nature of the research problem, a positivist quantitative approach was adopted although the survey instrument included space for qualitative comments to some of the latter open-ended questions. The survey instrument used in this study was adapted from validated survey instruments used in previous studies about the occupational health of hotel housekeepers.

Data was collected from 177 hotel housekeepers. The local union of hotel housekeepers assisted with data collection from hotel housekeepers in local hotels in Orlando. The questions were specific and relevant to housekeeping department work conditions. An informed consent to participate was included in the survey to inform respondents about the voluntary nature of participation and the possibility of withdrawal from participation in the study was possible. Data was coded for entry in SPSS for subsequent analysis. Before starting analysis, the data was explored for incomplete surveys, errors and outliers. The scale of the data was compressed for better data analysis results. Descriptive statistical analysis was conducted to understand the sample collected. Furthermore, chi square and t-test was used to explore physical workload, ergonomic problems and prevalence of pain among housekeepers.

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CHAPTER 1: INTRODUCTION

All establishments in the lodging industry require hotel housekeeper cleaning services. This service varies depending on the type of lodging establishment in question (Raghubalan & Raghubalan, 2009). For example, in five star hotels housekeeping services are required every hour of every day of every year (Jones, 2007). In most hotels, the cleanliness of guestrooms is one of the most important service standards expected by customers. The role of the housekeeper is thus critical to service provision and hotel profitability (Faulkner & Patiar, 1997).

As an occupation, housekeepers are the largest workforce in the hotel industry and constitute 26% of all hotel employees (Bureau of Labor Statistics, 2003). The hospitality industry is a major recruiter of low wage workers with the majority working in housekeeping departments (Krause, Rugulies & Scherzer, 2005). The hourly pay for hotel housekeepers varies among different states in the US, although the average pay for hotel housekeepers is above the national minimum wage in the majority of states in the country. That said, housekeepers have very little chance of advancement through their careers (Shankman, 2014). With regard to the work shifts of housekeepers, corporate hotels like Marriott have a specific housekeeping work schedule of eight-hour shifts and five-day workweeks. However, these schedules are subject to change based on season, room occupancy and customer's cleanliness actions within the hotels (Shankman, 2014).

Front-line employees can help improve the quality standards of the hotel (Jones, 2007). However, and on the other hand, housekeeping staff are not included in setting these standards

as they have very low command over their job and there is a lack of constructive communication with management (Woods & Viehland, 2000). Regarding communication with managers, studies have revealed that managers were found to be disrespectful to female housekeepers, with many of them failing to respect women's work roles (Kensbock, Jennings, Bailey & Patiar, 2013; Sonmez et al., 2013). Similar studies also found inequitable rewards distributed among housekeepers for their contribution. Their concerns may be well founded as several studies have documented that oppressive supervisory behavior quietened the concerns of housekeepers regarding work performance. These concerns, if noticed, could have helped improve hotel operations (Kensbock, Jennings, Bailey & Patiar, 2013; Krause, Rugulies & Maslach, 2010). Marginalization and oppression are the supervisory behaviors towards housekeepers work in hotels. Marginalization refers to room attendants' exclusion from decision making and social acknowledgement based on the undesirable nature of their job (Kensbock, Jennings, Bailey & Patiar, 2013).

Besides the poor nature of housekeeper's work, hotels see housekeeping as a labor expense to be cut (Sturman, 2006). Low pay, low prestige and low barriers to entry and exit make housekeeping departments infamous for their high turnover rates, with this turnover contributing to housekeepers' performance inconsistencies (Sturman, 2006). There are many different methods to measure housekeepers' performance like customer feedback and supervisor's inspection of cleaning methods. In the study by Sturman (2006), for example, it was found that housekeepers are in constant use of cleaning chemicals with performance measurements based on the amount of cleaning chemicals used. However, the amount of chemicals used varies according to room types, stay over or check out status, number of rooms

cleaned, nature of guests and other external circumstances. These variations makes it difficult to identify consistency in performance accurately. An additional note, these chemicals used by housekeepers are hazardous in nature (Hsiech, Apostolopoulous & Sonmez, 2013).

The physical workload of hotel housekeepers involves tasks such as packing trolleys with linen and other amenities, emptying bins, stripping and replacing towels and bed linen, dusting, cleaning bathrooms, vacuuming, mopping floors and replacing amenities (Oxenbridge & Moensted, 2011, p.14). These tasks are important for customer comfort, hygiene, and safety (Powell & Watson, 2006). The number of rooms cleaned is decided by the management and varies from hotel to hotel as labor contracts play a major role (Krause et al., 2005). If the workload exceeds the limit of 15 rooms cleaned per day, it is believed that it will lead to a number of injuries to housekeepers (Mest, 2013). Studies by Burgel, White, Gillean and Krause (2010) suggest that there is a significant association with shoulder pain and psychosocial job factors. Psychosocial factors relate to work overload, time pressure and payment systems are also common contributors to risk factors for musculoskeletal injuries (Oxenbridge & Moensted, 2011, p.8). Overall, hotel cleaners are predominantly women, immigrants and minorities working under difficult conditions such as long hours, ergonomic strain, chemical exposure, poor pay, low job control, job insecurity and a wide array of other physical and mental health risks (Krause et al., 2005, p.326; Sonmez et al., 2013, p.360). Data regarding percentage of immigrants and minorities are not readily available and the data collected by the Bureau of Labor Statistics (2016) or Census Bureau of American Fact Finder (2016) suggest generalized national data which are neither specific to states nor ethnicity. For example, it does not provide information specifically about immigrant hotel

housekeepers. Many studies to date have focused on correlation with housekeepers work and low wages or illness and injuries but there is a paucity of studies on relationship between prevalence of pain among hotel housekeepers and work experience in five star hotels. Additionally, there is limited research studies about prevention methods and ways to prevent work hazards in housekeeping department. This research study, therefore, aims to provide recommendations to practitioners about necessary changes required in work conditions of hotel housekeepers but first, the problem statement of the issues faced by hotel housekeepers and their work condition are discussed as follows.

1.1 Problem Statement

In light of the studies reported in the preceding section, problems pertaining to physical workload, ergonomic problems and the prevalence of pain are widespread among low-wage hotel housekeepers. In part magnified by a lack of support and respect from supervisors (Kensbock, Jennings, Bailey & Patiar, 2013), this study examines the extent to which the working environment for hotel housekeepers is safe.

According to Mest (2013) there is a link between turnover and hotel housekeepers' injuries. Musculoskeletal injuries are the most common among hotel housekeepers due to the physical demands of the requirement of job. This suggests that hotel housekeepers will rely on worker compensation claims, however, there is limited research regarding these claims and their usefulness. Krause, Dasinger and Neuhauser (1998) suggest that modified work programs are cost effective, namely light duty, ergonomic equipment modification, graded work exposure and "job coaching." Hotel housekeepers who face injuries at work can take

advantage of modified work programs until they recover from their injuries. Given the work environment, which enhances job stress among hotel housekeepers, it is important for them to get psychological assistance and become aware about physical mechanisms of their job tasks.

Recent literature on occupational injuries in the hotel industry suggests that there is a disparity in rates of injuries between genders and races. Additionally, rate of injuries differs among different companies (Buchanan, Vossenas, Krause, Moriarty, Frumin, Shimek & Punnett, 2010). This suggests that individual companies can take initiative to make necessary changes in order to decrease injury rates. Other psychosocial factors that emerged from previous literature are discussed as follows. Several researchers suggested that time pressure, low job control, low wages, low job security and limited opportunities for advancement are the characteristics of guest room cleaning work (Krause et al., 2005; Bernhardt et al., 2003; Lee & Krause, 2002), after having examined hotel housekeeper's work. Nevertheless, the minimum time taken to clean guest rooms suggests that the housekeeping department is efficient (Hsu, Ho, Tsai, & Wang, 2011).

The current research will discuss the possible reasons for the minimum and maximum time taken to clean guest rooms. This study will focus on hotel housekeeper's work conditions, ergonomic problems and prevalence of pain among low-wage hotel housekeepers working in five star hotels in Orlando and fill in the gap in literature by focusing on hotel housekeeper's perceptions with the above mentioned measurement items.

1.2 Background and Need

Hotel employees have higher rates of occupational injuries and sustain more severe injuries than most other service workers (Buchanan et al., 2010, p.116). Hispanic workers followed by African American workers are believed to have the highest Occupational Safety and Health Administration (OSHA) reported injuries in the U.S. (Buchanan et al., 2010). Housekeeping employees under the category of non-unionized workers, immigrants, or politically vulnerable individuals are less likely to report work-related injuries (Scherzer et al., 2005). To explain further, non-reporting of injuries is due to language barriers, fear of retaliation, or lack of understanding of legal rights under worker compensation laws and OSHA standards (Buchanan et al., 2010, p.121).

There is very limited research about the exact economic impact that work-related injuries have upon the hotel industry. "Irrespective of the costs associated with work-related musculoskeletal disorders, these injuries represent a noteworthy opportunity for cost reduction since these incidents are often manageable with many cases preventable" (Amell & Kumar, 2001, p.256). There are six job tasks that can possibly cause injury-related problematic work situations; making beds, moving cleaning carts, lifting and lowering loads, cleaning bathrooms, vacuuming, dusting and cleaning and trash removal and lifting furniture (Landers & Maguire, 2004). Previous research has found that causes of musculoskeletal disorders are caused due to biomechanical risk factors. However, it is found that psychosocial aspects of work (quantitative workload, lack of job control and job future uncertainty) contribute to the development of work related musculoskeletal disorders (Schleifer et al., 2002, p.421). Amell and Kumar (2001) found that "insufficient recovery time following the completion

of tasks, high task repetition, awkward posture and high force requirement of tasks lead to musculoskeletal injuries" (p.259).

To minimize the risk of developing musculoskeletal injuries it is imperative to ensure health and safety standards are met. A detailed description of real working conditions faced by hotel housekeepers in Orlando's five star hotels is described in this study. Orlando serves as an ideal location in which to study this problem. In 2015, Orlando recorded 105 million visitors, which includes out-of-state and international visitors (Dineen, 2016). There was an increase in 2016, Orlando recorded 113 million visitors (Dineen, 2017); with such a large tourist influx, hotels witnessed a rise in occupancies. This makes it ideal to study hotel housekeepers work conditions in the sunshine city of Orlando in the years 2016-2017. The need of the study is to explore the health and safety standards of hotel housekeepers in order to gain an understanding that will lead to recommendations for minimizing injury risks. Overall, this study investigates physical workload, ergonomic problems and prevalence of pain among hotel housekeepers in Orlando which will lead to recommendations to improve work conditions. The purpose of the study is described as follows.

1.3 Purpose of Study

The purpose of this study is to focus on ergonomic problems and its impact on time taken to complete job tasks, and the potential relationship between number of years worked on workload and pain among hotel housekeepers. Additionally, the relationship between number of years worked as hotel housekeeper and wages will be identified. This study makes three important contributions towards understanding work and health related characteristics of

low wage hotel housekeepers in Orlando region.

First, this study measures number of years worked as hotel housekeeper and perception of work conditions among hotel housekeepers. Previous studies have focused on qualitative research related to these areas leaving much to explore the relationship between workload and perception of work conditions among hotel housekeepers. This study investigates physical workload, ergonomic problems and prevalence of pain among hotel housekeepers.

Second, housekeepers' ergonomic issues at work such as the effects of broken linen carts and lack of cleaning tools and time taken to clean rooms are examined. More specifically the equipment and supplies housekeepers work with and overall ergonomic issues faced by hotel housekeepers in Orlando's five star hotels are explored.

Thirdly, musculoskeletal injuries are common among hotel housekeepers (Montross, 2013). Previous studies have focused on safety standards but there is limited research about management adhering to these safety standards. Also, there is limited studies about occurrence of pain among hotel housekeepers according to race.

This topic is understudied due to the difficult access to hotel housekeeper to determine their work conditions, ergonomic problems and prevalence of pain. Normally, hotel housekeepers are unable to voice their concerns due to a lack of communication skills and intervention of researcher is needed to highlight their work conditions.

Overall, this study is a positivist quantitative study with data collected from housekeepers in the Orlando region and serves as a foundation for understanding the work conditions of hotel housekeepers, ergonomic issues faced by hotel housekeepers and pain due to work pressures

and other concerns. In order to fill the existing research gap in the hotel industry literature, this study gives important implications on ways to improve housekeeper work conditions. The research objectives are discussed as follows.

1.4 Research Objectives

This study aims to establish relationship between number of years worked as hotel housekeeper and physical workload, wages then prevalence of pain among hotel housekeepers working in five star hotels in Orlando region. Additionally, this study will address time taken to complete job tasks, which is effected by ergonomic problems. The findings will provide useful information for the hospitality and tourism industry to improve the working conditions of these hotel housekeepers, specifically the objectives of the study are to:

i. Explore the relationship between number of years worked as hotel housekeeper and work conditions?
ii. Do ergonomic problems have an impact on maximum time taken to clean rooms?
iii. Is there a positive relationship between hotel housekeeper's race and prevalence of pain?
iv. Do wages differ in terms of number of years worked as hotel housekeeper?
v. Identify recommendations for improvement in working conditions of hotel housekeepers?

Overall, this study hopes that the findings will help present recommendations for improvement in housekeeping working conditions. The literature about working conditions definitions used in this study are presented below.

1.5 Definitions

Ergonomics- "Ergonomics is the theoretical and fundamental understanding of human behavior and performance in purposeful interacting socio-technical systems, and the application of that understanding to design of interactions in the context of real settings" (Wilson, 2000, p.560).

Low Wage Workers- Low wage work is usually measured either in terms of earned income relative to what is required by a family to purchase basic needs, or by ranking jobs in the labor market based on the overall wage distribution (Krause et al., 2005, p.326).

Light Duty- "Any temporary or permanent activity less than that of regular or full duty which enables a disabled worker to perform a job according to a set of conditions prescribed by a health care provider. Light duty positions are paid and performed in a competitive work environment. They range from adaptations of the worker's pre-injury job to an entirely different job at the same or different company, either pre-existing or specially created for the disabled worker. Other terms for light duty used in the literature are alternate duty, alternative duty, lighter duty, limited duty, modified duty, and restricted duty" (Krause et al., 1998, p.115).

Job Coaching- Job coaching can be viewed as "unlocking a person's potential to maximize their own performance and it is helping them to learn rather than teaching them" (Whitmore, 2003, p.40).

1.6 Ethical Consideration

Procedures were followed to ensure this study was conducted in an ethical manner. Institutional Review Board approval is attached in the appendix section of the research study. Members of the hotel housekeepers' union verbally informed consent to hotel housekeepers. The researchers know about the Health and Safety in Employment Amendment Act, 2002. It is also the intention to extend the scope of analysis by exploring a range of employment factors such as heavy workloads, interpersonal relationships and organizational factors, which can contribute, to occupational stress amid workers. No personal or identifying information about participating housekeepers were collected. The surveys are kept confidential in a safe cabinet in the thesis advisor's office. All these precautions were met to ensure minimal potential risks to participants. The following chapter provides a synthesis of previous research studies in relation to workload, ergonomic problems and prevalence of pain among low wage hotel housekeepers.

CHAPTER 2: LITERATURE REVIEW

In reviewing published research on occupational injuries and illness, it was evident that very little scholarly work has been published in the domains of hotel housekeeper's health and safety to date. Through a review of the literature in specific to hotel housekeepers work conditions, three areas of research come to fore, namely physical workload, ergonomic problems and prevalence of pain among hotel room cleaners. Consistent with academic research in the hospitality field are the findings from a recent study by the National Institute for Occupational Safety and Health (NIOSH) in the U.S. which states that housekeepers with musculoskeletal injuries are under researched (Bearnard et al., 1997), with limited knowledge and research also evident among dishwashers, cooks and other service sector workers (Sengupta et al., 2002). The new research agenda for the National Institute for Occupational Safety and Health (NIOSH) for the next ten years (2016-2026), is thus set to focus on protection from work-related safety and health hazards with the promotion of injury and illness prevention in purpose of supporting employee well-being (Howard et al., 2016).

With the hotel industry being so labor intensive, it is perhaps no surprise that in addition to workload and work conditions, the issues of workplace injuries and illness is of such prevalence as evidenced in the studies by Krause, Scherzer and Rugulies, (2005), Krause, Maslach and Rugulies, (2010), Premji and Krause, (2010) to name but a few. This body of work has its origins in studies by Frumen, (2006) and Liladrie, (2010) with the earliest studies going as far back as Bigos, Battie, Spengler, Fisher, Fordyce, Hansson and Wortley, (1991) which studied aircraft employees of Boeing in the State of Washington, US with results which

suggests that physical prevention methods were unsuccessful as employee back pain persisted.

In the specific context of hotels and hospitality a number of studies (see for example Landers & Maguire, 2004; Krause, Rugulies & Scherzer, 2005; Premji & Krause, 2010; Liladrie, 2010; Burgel, White, Gillen & Krause, 2010; Buchanan et al., 2010; Yap, 2011; Sanon, 2013) show the relation between different factors at work and injuries in different parts of the body. One such example is the highly demanding physical strains of the jobs of housekeepers, which puts them in a greater risk for pain in the back and shoulder (Frumin, 2006). For the most part, hotel housekeepers work alone with limited interaction with other housekeepers on the job (Wells, 2000). The study, which was conducted in Las Vegas, showed that 29% of hotel cleaners ranked shoulder pain as very severe on a scale of none to very severe. Latinos are the majority in terms of ethnicity among Las Vegas housekeepers. Respect and recognition from others are considered as rewards although, despite this fact, there was the lack of respect from supervisors, which is a major concern for Las Vegas hotel cleaners. Across the US hotels, housekeepers face a lack of respect and recognition from managers (Hsieh, Apostolopoulous & Sonmez, 2013). In a similar study Frumin, (2006) found that there was a strong association with effort-reward balance and shoulder pain than job content (Burgel, White, Gillen & Krause, 2010).

Workplace injuries are not the only issue for hotel housekeepers with a myriad of other issues of concern debated in the literature outlined in this study. Such areas include ethnicity (Premji & Krause, 2010; Yap, 2011), diversity in the workplace and the need for diversity management practices (Enz, 2009; King et al., 2011), recruitment of bilingual staff, cross-cultural training (Manoharan, Gross & Sardeshmukh, 2014) and absenteeism (Yap, 2011; Mest,

2013). According to a study by Woods and Viehland, (2000) American Hotel & Motel Association (AH & MA) revealed that out of 513 total housekeeping managers in the US, 315 are women which is 61.4% of hotel housekeeping managers are women. A higher percentage of entry-level hotel housekeepers are also women. Some of the reasons behind these concerns such as need for diversity management practices, absenteeism etc. include the fact that housekeepers are very often disadvantaged socio-demographically as compared to other working populations, with some groups facing more adversity than others due to ethnic origin, language and immigrant status (Buchanan et al., 2009). Consistent with hotel housekeepers in Canada, the majority are immigrants of either African or Latin American descent (Seifert & Messing, 2006). More than a decade ago, a study by Selwitz (2001), observed the lack of communication skills among housekeepers in North American properties.

In studies conducted in the U.S., it was found that Hispanics and non-English speaking workers are disadvantaged as compared to other workers in getting worker compensation due to burdensome processes or employers not being willing to take action (or discouraged by medical providers) eventually refraining housekeepers from reporting injuries or illnesses (Hsieh et al., 2006; Krause et al., 2009). Other reasons for not reporting workplace injuries observed in Las Vegas hotel room cleaners include high denial rate of worker's compensation claims, which creates a barrier to these workers. Additionally, the hotel workers believed their pain would subside and did not report injuries because these workers perceive it as manageable but the workplace injury was severe as shown by absence from work, sick leave for pain and pain medication used by these housekeepers. Even if the claim was accepted, wage replacement benefits are considerably lower than regular take-home

pay (Scherzer, Rugulies & Krause, 2005).

According to the 18th Annual Report of the National Academy of Social Insurance on workers' compensation benefits, coverage, and costs, (2013) in Florida, for instance, total benefits decreased in 2009-2011 (-2.9%), followed by a sharp increase in 2011-2013 (+9.5%). A number of factors contribute to variations in total workers' compensation benefits paid within a state from year to year. Some of the reasons behind such modification are changes in the number of work related injuries and illness, fluctuations in the state labor market and changes in the cost of medical care. Research by Oshins and Johnson (1992), suggests that Hilton Hotel Corporation through a self-insurance program took the workers' compensation problem into their own hands with regional offices throughout the US to handle the claims. However, there is limited up-to- date information since 1992 about major hotel corporations like Hilton with a majority number of worker compensation claims due to housekeeping workplace injuries in the US.

Ethnicity, gender and employer play an important role in exploring the social environment, ergonomics and safety hazards at workplaces (Buchanan et al., 2010). Since there are differences of injury rates among different employers, it is significant in understanding workplace injuries in urban area hotels like New York and San Francisco. The following literature review discusses about workload, ergonomic problems and prevalence of pain among hotel housekeepers. Literature on workplace injuries caused by heavy workload put on hotel housekeepers by managers is discussed as follows in the next subheading.

2.1 Workload

Housekeepers are responsible for cleaning rooms and public areas of the hotel. Hotel housekeepers must fulfill guests' requirements and provide 24 hours and seven days a week services, which means that housekeepers need to work within a three-shift system and many employees in the department. Housekeeping departments contribute directly to hotel expenses and income so when the housekeeping quality is fixed, the department is efficient (Hsu, Ho, Tsai & Wang, 2011). The housekeeping department is considered low skill work, which requires abilities like attention to detail, customer interaction and considerable physical strength to perform tasks. Housekeeping departments of hotels are the backbone of the accommodation sector (Bernhardt, Dresser & Hatton, 2003). The majority of studies on workload related stress to date have been completed by Borg and Kristensen, (2000), Davis and Haney, (2000), Krause et al. (1997), Krause et al. (1998), Krause et al. (1999), Parker and Krause, (1999) and Krause et al. (2003). Some of these studies are in the public sector such as public transit, airlines and healthcare, the results of the research study in hospitality sector suggest there is a strong association with physical job factors and pain outcomes among housekeepers.

Hotel room cleaners are generally paid on an hourly basis and work eight hours a day (Krause et al., 2005). Management decides the number of rooms cleaned on a daily basis, which may vary from one hotel to another as labor contracts need to be followed (Krause et al., 2005). The average number of rooms, excluding check-out rooms, a housekeeper can complete while avoiding the possibility of risk of injury is 15 rooms per day. If a housekeeper goes beyond 15 rooms per day then housekeeping management must deal with more injuries faced by housekeepers (Mest, 2013). A practice observed in U.S. hotels are when the number

of housekeeping staff are not enough to complete the daily tasks of the hotel, the best solution by management is to force housekeepers on duty to work overtime with the need to work overtime is widely considered as a requirement of the job (Bernhardt, Dresser & Hatton, 2003). Nowadays, the hotel industry has adopted a web-based labor scheduling systems, which is an application service provider, which schedule employees by demand forecasts, most importantly rules are enforced in the system to avoid over staffing (Jones, & Siag, 2009). However, there is no rule, which avoids the under-staffing situation in housekeeping department.

Las Vegas hotel cleaners were found to report 4.5 times more poor general health than the overall U.S. population (Krause, Rugulies, & Maslach, 2010). The housekeepers complained that the efforts they put into work were not rewarded equitably. The physical workload and ergonomic problems had an effect on effort reward imbalance and health concerns. All the Las Vegas health cleaners studied had health plans provided through a union-company trust fund. The same study found that Latinos had a low health score compared to the overall U.S. population.

A New York Times article, which is now a decade old, explains the current situation of working condition of hotel housekeepers in five star properties. The article reported that brands like Hilton and Westin, which are located in major cities like Honolulu and Chicago, wanted to resemble royal bedrooms and revamped guest rooms with heavier mattress, more pillows and more amenities like bathrobes and coffeepots (Greenhouse, 2006). These hotels added extra tasks to the housekeeper's daily workload like putting the bathrobe on a hanger and washing coffeepots. The hotel housekeepers' union noticed that these refurbished rooms, lead to an increase in injuries. Even though the number one priority of

this union is to increase wages for hotel housekeepers, they took this issue as momentous to inquire with the employers (Bernhardt, Dresser, & Hatton, 2003). Since brands like Westin started to make their rooms more appealing to customers, with "heavenly beds" introduced in 1999, competitors such as Marriott, Crowne Plaza followed suit by spending millions on softer sheets, feather filled duvets, and other linen amenities. Yet, Hilton also made other changes like removing bathtubs from king sized rooms and replacing box television with flat screen televisions which helped relieve the room cleaning process (Bernhardt, Dresser & Hatton, 2003). Overall, these changes increased the job tasks that could lead to possible injuries for hotel housekeepers but consequently, for guests, American Hotel and Lodging association found positive responses of better sleep and comfortable stay.

Consistent with literature about hotels in Montreal lavish amenities were added to attract customers. Guests on business travel to Montreal were perceived to spend more and were target groups of these new refurbished hotels that wanted to attract these customers before their competitors. These marketing efforts increased the workload of Canadian hotel housekeepers as they have to clean coffeemakers and trays of food products. Additionally, the changes of heavier mattresses and extra bed sheets led to increase in housekeeper's efforts in room cleaning (Seifert & Messing, 2006). Heavy workload coupled with ergonomic problems thus lead to increase in job stress as discussed in the following section. Consequently, the following relationship was hypothesized:

H1- There is a positive relationship between number of years worked as hotel housekeeper and workload.

2.2 Ergonomic Problem

Hotel housekeepers are required to clean hotel guestrooms, they have specific tasks to complete in their shift work within a limited time period (Raghubalan & Raghubalan, 2009). The many hazards which can be faced by hotel housekeepers are physical, chemical, biological and psychosocial have been studied in the US by many researchers (Makulowich,1996; Selwitz, 2001; Hsieh, Apostolopoulos & Sönmez, 2013).

The physical hazards faced by hotel housekeepers are caused due to repetitive housekeeping functions. The daily task of housekeepers are making beds (repeated forward trunk flexion and rotation), moving cleaning carts (pushing and pulling), lifting and lowering loads (repeated trunk flexion/extension and rotation with poor body mechanics), cleaning bathroom, i.e. tubs, floor and toilet (repeated forward trunk flexion and rotation, poor body mechanics, lifting), vacuuming, dusting and cleaning (poor body mechanics, lifting, forward trunk flexion and rotation), trash removal and lifting/ repositioning furniture (repeated lifting with trunk flexion/extension and rotation) (Landers & Maguire, 2004). Table 1 shows the list of daily tasks and body movements.

Exposure to chemicals used for cleaning toilets and, sinks can irritate the skin and cause other respiratory diseases (Sonmez, Hsieh & Apostolopoulos, 2013). Other possible risks of volatile organic compounds include respiratory problems and cancer and exposure to solvent-based products can be damaging to kidneys and reproductive organs (Stellman, 1998). Biological hazards such as exposure to broken glassware and medical waste left by guests create risks for infectious diseases such as hepatitis (Makulowich, 1996).

Table 1 Job tasks that can lead to injuries

Job tasks that can lead to injuries	Movement of the body
Making Beds	Pushing and Pulling
Moving Cleaning Carts	Repeated trunk flexion/extension and rotation with poor body mechanics.
Lifting and Lowering Loads	Repeated trunk flexion/extension and rotation, poor body mechanics, lifting.
Cleaning Bathrooms (i.e. tubs, floor and toilet)	Repeated forward trunk flexion/extension and rotation, poor body mechanics, lifting.
Vacuuming, Dusting and Cleaning	Poor body mechanics, lifting, forward trunk flexion and rotation.
Trash Removal and Lifting/ Repositioning Furniture	Repeated lifting with trunk flexion/ extension and rotation.

(Landers & Maguire, 2004)

Psychosocial factors, which are work related stress, caused by heavy workloads coupled with time constraints. To add to these factors, hotel housekeepers face a lack of support and respect from supervisors (Hsieh, Apostolopoulous & Sonmez, 2013).

On the other hand, Mest (2013) challenges U.S. hotels to train housekeepers on the consequences of their cleaning methods and improved ways of handling equipment to prevent causing health and safety risks for themselves. For instance, on many occasions housekeepers pull heavy objects including housekeeping carts and fill plastic bags full of wet linen, swing it over their backs, and drag it across the floor, this kind of actions cause back

strain. Additionally, hotel housekeepers use their necks to push pillows into pillowcases, which causes neck strain and aches (Mest, 2013).

It was observed in Montreal hotels that cleaners were not involved in equipment purchase which resulted in carts being too heavy and push bar too high for room cleaners. Furthermore, cleaners in these hotels were faced with conflicts within their group caused by time-pressured work. The cleaner's workload required the association of physical, mental and emotional demands coupled with the necessity to follow newly implemented procedures by employers (Seifert & Messing, 2006).

Housekeepers in the U.S. are expected to perform conventional cleaning, which requires the use of chemicals that may not be "green cleaning products" (Jones, 2007). Housekeepers are provided with gloves soaked in oil to collect dust while performing their duties but there is very little evidence among practitioners and researchers about the efficiency of such innovative items used by hotel housekeepers for cleaning purposes. Equipment such as vacuum cleaners, if not working properly, will cause the housekeeper to spend time trying to fix it or get it fixed during their work shift instead of completing the work for that day (Raghubalan & Raghubalan, 2009). Based on a study in a hotel in Central Taiwan, Hsu, Ho, Tsai and Wang, (2011) conclude that hotel housekeeper's proper preparation and careful handling has a significant influence on providing rooms efficiently.

Housekeepers are faced with many ergonomic problems in relation to equipment and supplies on a daily shift but they have to ensure rooms and bathrooms look clean at the very least, at the surface level. Furthermore, in most U.S. hotels, the room check

completed by housekeeping management are superficial cleaning standards (Raghubalan & Raghubalan, 2009).

There is very little information recorded in the literature about the efficiency of methods used by U.S. hotel housekeepers for bed making especially putting sheets and pillowcases, which requires a lot of effort by housekeepers. The constant movements on a daily basis will definitely have an effect of wear and tear on the body of hotel housekeepers. Consequently, the following relationship was hypothesized:

H2- There is a positive relationship between ergonomic problems and time required to clean each room by hotel housekeepers on a typical work day.

2.3 Prevalence of Pain

There is limited research about prevalence of pain among hotel housekeepers, as researchers have not attempted to cover such research studies. A study suggested that work-related musculoskeletal disorders of the neck/shoulders, arms, elbows, wrists, and hand are the leading occupational health problem (Schleifer et al., 2002). Sixty-two percent of all housekeeping injuries were identified as musculoskeletal injuries, which result in the loss of flexibility and strength, overexertion, muscle fatigue and functional disability (Montross, 2013). The Bureau of Labor Statistics does not provide rates of occupational injuries for a single occupation. The reason behind this was a change in Occupational Safety and Health Administration (OSHA) rule for defining a recordable injury/illness. This rule change explained the decline of reportable workplace injuries in manufacturing industries but there was not a significant change in trend in services sector in the past couple of years. Another

reason of the decline was to show that employers and workers in the private sector made occupational safety and health a priority (Friedman & Frost, 2007).

There is clinical evidence that women are more susceptible to stress-related and autoimmune disorders compared to men (Bourke, Hareell & Neigh, 2012). This should be a concern of housekeeping management, considering that the majority of hotel housekeepers are women, although there is a small percentage of male housekeepers (Buchanan et al., 2010). The hyperventilation model created by Scheifer, Ley and Spalding (2002) suggests that psychosocial aspects of work might contribute to the development of musculoskeletal disorders, the gradual result of stress factors, emotional strain, muscle tension, muscle pain to final work-related musculoskeletal disorders. "The theory suggests psychosocial risks can cause emotional strain which results in hyperventilation. Hyperventilation is alteration from abdominal breathing to chest breathing which increases the biomechanical load of the ancillary muscles of respiration" (Deeney & O'Sullivan, 2009, p.242).

A study of housekeepers in major cities like New York, San Francisco, and Honolulu found housekeepers to have the highest injury rate compared to kitchen staff, stewards and banquet servers (Buchanan et al., 2010). Furthermore, Hispanic women were found to have the highest injury rate compared with women of other ethnicities and compared with male housekeepers. Hotel housekeepers are a high-risk group for hypertension because they work under high-risk conditions, a study on Haitian immigrant housekeepers in Miami, Florida found both positive and negative impacts of work conditions on hypertension management (Sanon, 2013).

A study that investigated Occupational Safety and Health Administration (OSHA) reported injury within the hotel industry for job categories of hotel housekeepers, cooks, stewards and banquet servers in full service hotels in the U.S. and found the majority of housekeepers to be unionized. Accordingly, the researchers worked with the union, received data from their employee rosters, and checked the Occupational Safety and Health Administration (OSHA) log records for the 2003-2005 period (Buchanan et al., 2010). The injuries were coded as three different types: for instance, "MSD" for musculoskeletal disorder, "acute trauma" and "others". The researchers studied five companies; study found that housekeepers were twenty-one percent of the workforce. The highest overall injury rate and the highest rate of MSD and acute trauma were among housekeepers and cooks. Hispanic workers compared to Asians, Blacks and Whites had the highest overall injury rate. The same study reported a second company to have the highest rate of injury for housekeepers followed by the third and fourth companies. Injuries varies among a number of factors, namely; gender, ethnicity, job title and hotel company. Furthermore, individual companies need to investigate discriminatory work practices. Agency hired hotel housekeepers is a common practice due to lower terms, conditions and compensation (Sanon, 2014). The same study about agency hired hotel housekeepers concludes that in-depth research with the help of occupational health professionals about agency hired hotel housekeepers' vulnerability to injuries and the need for policies to meet their health needs should be a future study.

Psychosocial factors at work increase the risk of musculoskeletal disorders (Schleifer et al., 2002). This study suggests hyperventilation-induced by job stress contributes to the development of musculoskeletal disorders. Furthermore, the decrease in muscle tissue

oxygenation and buildup of metabolites due to repetitive tasks can lead to tissue damage. Imbalances between job demands and an individual's resources to cope will inevitably occur. A way to cope suggested by Schleifer et al. (2002) is relaxation and breathing training as rest breaks are effective tools for reducing musculoskeletal discomfort. Another suggestion by a senior consultant at American Hotel and Lodging Association, is stretching activities before shifts begin, a good use of time to reduce preventable injuries (Mest, 2013). Development and implementation of effective ergonomic systems that promote use of safer body mechanics during bed making (Montross, 2013, p.17). In addition, management needs to make a commitment to govern safety and health standards, thereby reducing costs involved with injuries and performing better than competitors do in operational efficiency and customer service.

This recommendation of management commitment to govern safety standards is consistent with suggestions by Landers and Maguire (2004). In the same study, the researchers investigated work injury programs in a large hotel in Las Vegas, and found a number of goals set by management to decrease the recordable injuries. Two goals, decrease lost workdays due to injuries and increase employee morale were accomplished. To elaborate, the study conducted with 50 housekeeping supervisors, 60 housepersons, and 340 housekeepers analyzed the relevance of wellness programs for hotel housekeepers who faced workplace injuries. The effectiveness of classroom lectures about the correct postures and body mechanics for the tasks attended by supervisors was observed. As a recommendation, the supervisors were encouraged to remind the housekeepers of correct body postures during their daily tasks. These supervisors were supposed to identify "at risk" employees. They had a light duty program

so that injured employees were involved in the work. The authors compared the total injury claims, direct medical expenses, total lost work time and total restricted duty for the year the program was implemented and the two years that followed. There was a significant decrease in claims, expenses and lost work time over next three years (Landers & Maguire, 2004). Overall, the main conclusions of the study by Landers and Maguire, (2004) suggests that the success of the program was due to a sense of increased managerial support, job satisfaction, and perception of care from the company. Consequently, the following relationships were hypothesized:

H3- There is a positive relationship between race and prevalence of pain among hotel housekeepers.

2.4 Low Wage Hotel Housekeepers

There is limited research in countries like UK and Australia. In the U.S., researchers have neglected to consider low remuneration of hotel housekeepers. The hotel and motel industry in the U.S. relies heavily on franchising agreements, roughly, 80% of hotel properties are franchised. Branded hotels comply with the laws and are market leaders as franchise agreements vary significantly across hotel and motel properties. To ensure fair practices in case of franchisee agreements, it is the responsibility of the franchisor to make unannounced visits to review payroll statements (Kerwin & McCabe, 2011). Besides being predominantly represented by women and physical tasks being highly repetitive, housekeeping as an occupation, is characterized by low wages and low skill (Krause et al., 2005). Housekeepers are generally paid wages lower than workers in other departments are; additionally they are

paid lower than housekeepers working in the healthcare field (Ohlin & West, 1994). According to Payscale Inc., (2017) housekeepers working in healthcare field in U.S. earn salaries between $8.75-$14.78; additionally, they earn $4- $27 overtime.

A study conducted in eight hotels in two major cities in the UK. In the southern mid-market budget hotels in the UK, most housekeepers were hired through contract companies, pay was based on a rate per room cleaned (i.e., a piece rate) which is 2.47 British Pounds ($3.20) per room or it could vary (Warhurst, Llyod & Dutton, 2008). Consistent with Australian hotels, common practice is contracting-out housekeeping services to labor hire agencies, which typically pay on a per room basis, additionally these hotels prefer employing migrant workers on temporary work visas (Oxenbridge & Moensted, 2011). In the South of the UK, Warhurst, Llyod and Dutton, (2008) suggest that management set targets for housekeepers to clean a set number of rooms per shift, for instance 16 rooms were expected to be cleaned in a 4 hour shift with a pay of 1.77 British Pounds ($2.30) per room. Researchers identified this practice as a bias as it results in unpaid overtime or the pay not able to make it to the standard of national minimum wage. However, hotels in the north of UK, which had hourly paid, fixed shift workers and salaried workers unpaid overtime was a common occurrence.

According to the National Occupational Employment and Wage Estimates of May 2015, the hourly mean wage of maids and housekeeping cleaners in Hawaii was $16.86 compared to Florida which was found to be lower at $10.09. Specifically, by region, in the Orlando-Kissimmee-Sanford area of Florida, the hourly mean wage was $10.27 ("Bureau of Labor Statistics," 2016). The reasons behind this could be that some states like Hawaii have minimum wage laws that exceed the federal standards, as state agencies are the primary enforcers of claims

under these laws. The residential rentals at Hawaii is higher compared to Orlando, according to Expatisan cost of living index, (2017) for 900 sq. ft. furnished accommodation in a normal area in Hawaii is $2,153 compared to Orlando, which is $1,216.

According to the housekeepers' labor union, the median U.S. wage for housekeepers is $9.51 an hour (Shankman, 2014). The average wage in U.S. can be increased as it is evident that wages are significantly higher in cities. Unions are the reason behind wage increases. The local labor union in Florida suggests that the difference in wages between Miami and Boston is, in Miami has just three union hotels and housekeeper makes $9 per hour while in Boston has more than 25 union hotels a housekeeper makes $13 per hour. Nevertheless, housekeepers in Marriott hotels are observed to go out of their way to decorate tip envelopes or make towel art in an attempt to draw tips (Shankman, 2014). Consequently, the following relationship was hypothesized:

H4-There is a positive relationship with hotel housekeeper's wages and number of years worked as hotel housekeeper.

To test the hypotheses formulated from the thorough literature review, the following methods chapter discusses the statistical analysis.

Table 2 Summary of housekeepers' work conditions literature

Article	Study Type	Participant Type	Key Findings	Relevance
Bigos et al, 1991	Longitudinal perspective study	Boeing company employees	Reporting a back injury is not simple event; 9.4% of employees studied reported hardly enjoying their job because of back problems.	Work perception and Psychosocial factors of job.
Bongers et al., 1993	Longitudinal, analysis of previous literature	Various work fields (general working population).	Most results suggest a relationshipbetween back trouble and work demands.	Psychosocial factors at work and musculoskeletal disease.
Krause et al., 1997	Cross-sectional study	Transit vehicle operators	Physical workload and psychosocial factors, (high job dissatisfaction) were associated with prevalence of back pain.	Psychosocial job factors and back pain.
Davis & Haney, 2000	Longitudinal, analysis of previous literature	Various work fields (general working population).	Job satisfaction and job stress are more consistently and more stronglyassociated with the development of lower back pain.	Psychosocial workfactors and lower back pain

Article	Study Type	Participant Type	Key Findings	Relevance
Lee &Krause, 2002	Participatory action research study	Unionized San Francisco room cleaners.	More than three quarters of the participants reported work related pain or discomfort.	Physical workload and psychosocial working conditions
Krause et al., 2005	Participatory research study, cross-sectional study.	Unionized hotel room cleaners in Las Vegas.	Bodily pain and back pain are widespread problems among hotel room cleaners (other: ergonomic issues).	Work-related musculoskeletaldisorders.
Burgel et al., 2010	Quantitative study, exploratory study	Unionized room cleaners from five Las Vegas hotels.	More than half of the participants reported shoulder pain.	Psychosocial job factors especially effort-reward imbalance.

Table 3 Summary of ergonomic issues literature

Article	Study Type	Participant Type	Key Findings	Relevance
Selwitz, R., 2001	Qualitative study	Housekeepers in North American properties.	• Lack of communication skills among housekeepers. • Training by supervisors to avoid work related injury.	Ergonomic issues with bathtub and chemical handling procedures.
Seifert & Messing ,2006	Qualitative study	Hotel room cleaners in two hotels in Montreal, Canada	• Room cleaners affected by upscaling of hotel furnishings. • Disruption among hotel room cleaners based on seniority, days off and division of workload. • General public should be made aware about issues of housekeepers. • Even though work intensification and outsourcing help reduce employer costs, but in terms of quality and economics, it is a loss to the employer.	Ergonomic and Psychosocial work.
Mest ,2013	Qualitative study	General housekeepers.	• Attributed by American hotel and lodging association and Petra solutions managers that more than 15 rooms a day puts housekeepers at risk • The reasons of high turnover can help address reasons of injuries. • Train staff to push carts.	Ergonomic issues and Human resource management.
Hsieh, Apostolopoulos., & Sönmez. 2013	Qualitative study	General room cleaners.	• Preventive measures for physical and chemical hazards are safety-training programs. • Eliminate work practice, which include biological hazard. • Prevention and intervention strategies to reduce hotel cleaners work stress and protect them from bullying.	Ergonomicstandards.

Table 4 Summary of Prevalence of Pain literature

Article	Study Type	Key Findings	Relevance
Landers & Maguire, 2004	Retrospective study.	Comparing the 2 years after the year the wellness program was implemented, there was a decrease in injury claims and medical expenses.	Pain management.
Friedman & Frost, 2007	Analysis of OSHA records.	The decline in injuries and illness is due to the change in OSHA recordkeeping rules.	Occupational injuries and illness record keeping.
Buchanan et al., 2010	Analysis of OSHA records.	Injuries rates differed among gender, company and ethnicity.	Occupational injuries and illness.
Bourke, Hareell and Neigh ,2012	Qualitative study	Clinical evidence has indicated that women are more susceptible to stress- related and autoimmune disorders than men.	Stress management.
Montross, 2013	Qualitative study.	Musculoskeletal injuries are the maximum among hotel housekeepers. Bed-making duties, by nature, put the back in its weakest position. Direct and indirect costs associated with absenteeism, turnover.	Housekeeping injuries.
Sanon, 2013	Qualitative study.	Coworkers helped each other with hypertension management. But there was conflict about work hour and work shift. Housekeepers were able to send money to family back home in Haiti. Doctor's expense is too much to handle. Supervisors put workers on "light duty" but discrimination on basis of race increased stress.	Stress management.

CHAPTER 3: METHODS

3.1 Introduction

In this chapter, the study sample, sampling strategy, research instruments, data collection procedures, and data analysis are discussed. The setting, data collection and sampling procedure will briefly discuss the method of data collection. Furthermore, a brief explanation about the survey instruments, the questions asked in the survey which pertains to the research and finally, introduction to the data analysis technique used in this study

The following research questions are addressed in this study:

What is the relationship between number of years worked as hotel housekeepers (independent variable) and work conditions (dependent variable)?

What is the relationship with ergonomic issues (independent variable) and time taken to complete rooms on a typical workday (dependent variable)?

What is the relationship between housekeeper's race (independent variable) and prevalence of pain (dependent variable) among hotel housekeepers?

What is the relationship between number of years worked as hotel housekeepers (independent variable) and wages (dependent variable)?

What are the different ways in which housekeepers work conditions can be improved?

The following Table 5 gives a detailed description about themes, questions of the research. The hypothesis will be tested later in the study, which will answer the questions of the study.

Table 5 Description of Study

Themes	Questions	Hypothesis
Physical Workload	Explore the relationship between number of years worked as hotel housekeeper and work conditions?	H1- There is a positive relationship between number of years worked as hotel housekeeper and workload.
Ergonomic Problems	Do ergonomic problems have an impact on maximum time taken to clean rooms?	H2- There is a positive relationship between ergonomic problems and time required to clean each room by hotel housekeepers on a typical work day.
Prevalence of Pain	Is there a positive relationship between hotel housekeeper's race and prevalence of pain?	H3- There is a positive relationship between race and prevalence of pain among hotel housekeepers.
Low wage hotel room cleaners	Do wages differ in terms of number of years worked as hotel housekeeper?	H4-There is a positive relationship with hotel housekeeper's wages and number of years worked as hotel housekeeper.
Improvements of Work Conditions	Identify recommendations for improvement in working conditions of hotel housekeepers.	

3.2 Setting

Interviewer-administered surveys were used to collect data from hotel housekeepers. Bilingual (Spanish-English; Haitian Creole-English) staff working for

the local union, who volunteered to collect data, made appointments with local hotel housekeepers and went to the homes of housekeepers to collect the data. This procedure was required to assure that housekeepers felt comfortable participating in the study, could respond using their native language, and had time to answer questions in the comfort and privacy of their own homes. Union staff collected the data in confidential settings of hotel housekeeper's homes because hotel workers would neither have time during work hours, nor would they feel comfortable discussing their work conditions, workload, and health and safety risks on the premises of their workplaces.

3.2.1 Data Collection

Data were collected using interviewer-administered surveys beginning in May 2016 through October 2016. The researcher conducted a thorough check of the data collected for missing answers to survey questions. The missing data surveys were returned to the union for completion. This was practiced to ensure complete and accurate information was gathered. Too many missing data could lead to errors in the data analysis results.

3.2.2 Study Sample and Sampling Procedure

A convenience sample of 177 hotel housekeepers working at hotels located in Orlando, Florida was used. Names of the housekeepers were selected from a list of hotel housekeepers that the local union is actively trying to recruit as members as well as the list of current members. Union staff contacted housekeepers and invited them to participate. Following basic

screening questions (e.g., current employment as hotel housekeepers, minimum of 1 year of employment), housekeepers were enrolled in the study. Study participants were asked for their signed informed consent to participate in the study before interviews began.

3.3 Survey Instrument

A survey instrument was developed by adapting from instruments used in previous studies of hotel housekeepers (Hsieh et al., 2013; Krause et al., 2005). Most questions on the survey can be classified as either closed or open-ended. Open-ended questions gave respondents freedom to respond in their own way and to not be restricted by choices. Some of the general questions asked about housekeepers are employer ID, years working as a housekeeper, name of hotel, union membership status, gender, age, ethnicity, and availability of health insurance and wellness programs offered in five star hotels.

Possible responses to questions on work load and work conditions included *check out (when the guest has checked out), occupied,* and *VIP* (*deep clean rooms), number of rooms per day and minimum and maximum time taken to cleaning a room*. Questions on occurrence of these work conditions in the past four weeks included *had to skip lunch, work longer hours, reprimanded for reporting a work-related injury, flipped mattress without help, light duty, had to clean bedbugs or lice, clean after sick people stayed in the room, found needles/syringes in the trash or bed lines, threatened with disciple for not finishing my room,* and *avoided going to the bathroom to finish my rooms*. Responses to these questions included *never,1-5 times, 6-9 times, 11-20 times and more than 20 times.*

Questions on perception of work focused on *constant time pressures due to heavy*

workload, don't get enough time off work to get the rest I need, don't take time off work for fear of losing my job, work under lot of time pressure to finish my rooms each day, salary I make is enough for me to make a decent life, if I had a choice I would not do this job, I am treated with respect by my employer, I am treated unfairly at work, My supervisor is respectful to me, My supervisor shows fav while assigning work, I am treated with respect by my co-workers, I am discriminated because of my race. The response scale used was *strongly disagree, disagree, agree or strongly agree* which increases the statistical analysis of these statements.

Equipment and supplies you work with; questions are as follows, *linen cart is too heavy, wet towels are too heavy, vacuum cleaner is too heavy or broken, cleaning supplies do not clean well, cleaning supplies irritate my eyes, do not have enough tools, long trip to take soiled linen to linen room*. The response scale was *no problem at all, very little problem, somewhat of a problem and a big problem*.

The housekeepers were asked whether the hotel shared written safety guidelines or if they saw them posted on bulletin boards. Additionally, investigation of injuries, if action was taken or not and if they received a reprimand was asked. Self-perceived health and safety at workplace was measured with 11 questions. The health and safety standards at the hotel were asked with some of the questions like *my workplace does not respond to suggestions to improve health/safety, management sometimes ignores health and safety standards, if I report work related injury I get coaching* with six possible answers included *strongly disagree, disagree, agree, strongly agree, don't know*, and *not applicable*.

Pain in different parts of the body was asked in a close ended question with a total of seven possible responses ranging from *none, very mild, mild, moderate, severe, very severe and not applicable*. For data analysis and purpose of small cell size, the responses are coupled for accurate statistical analysis, for instance *very mild* and *mild* are numbered the same. Similarly, *very severe* and *severe* are numbered the same.

The questions used to measure items to prevent work related injury like *back belt, knee pads, gloves, eye protection, mask and pain medication* (open ended question to give respondent the opportunity to write the response). The scale of measurement ranged from *always, most times, sometimes, rarely and never.*

The wording of the question related to dealing with work stress is emotionally loaded, the information asked is about personal choices made by respondents. The response scale ranged from *always, most times, sometimes, rarely and never*. The recommendations to improve work conditions gives sixteen options and so gives respondents the option to select as many as possible. For instance, some statements are as follows, *increase wages, provide more breaks to rest, treat housekeepers with respect* There are four open ended questions for respondents to suggest any recommendations to improve work conditions.

Overall the questionnaire items were short and clear cut. The questions were specific and relevant to the point for housekeeping department employees to easily understand. An informed consent to participate was included in the survey to inform the respondent about the voluntary nature of participation and withdrawal from participation in the study was possible at any time. Numbering each of the possible responses helps in the coding process in SPSS. The survey

instrument used to test the questions for the research is attached in the Appendix.

3.3.1 Assessment of Pain

Several different pain outcomes measures were used from both standardized instruments and survey questions specifically developed for this project (Krause et al., 2005, p.328). The short form 36-question instrument of overall bodily pain has been validated across numerous populations by researcher Ware, (1993). Respondents were asked, *"How much bodily pain have you had during the past 4 weeks?*" and given seven response categories: *"none", "very mild", "mild", "moderate", "severe", "very severe" and "not applicable".*

Musculoskeletal pain was assessed for 12 body regions for the past four weeks using a question "*During the past four weeks, which did you experience as a result of your work'?* and the response categories are *"none", "very mild", "mild", "moderate", "severe", "very severe" and "not applicable".* Besides these questions, other prevalence of pain related questions included *burning in eyes, burning on my skin, open wounds, burns from chemicals, sprains, fractured bones, dislocation of joints, sickness or fatigue, falls, risk to pregnancy and losing fingerprints*. Utilization of pain medication was assessed by single open ended question: *"pain medication" or use "prescription medication"*

3.3.2 Assessment of Physical Workload

The following questions were asked *Number of check-out, occupied and general rooms cleaned per worker during the last workday.* Ergonomic index, a sum score of 8 different specific ergonomic problems observed by room cleaners that would increase their work effort during each task due to faulty equipment or other reasons. Problems at work was asked as "*How big of a problem are these work issues"?* answer options were *"no problem at all", "very little problem", "somewhat of a problem" and "a big problem"* (Krause et. al, 2005, p.329).

3.3.3 Assessment of Work Conditions

Work conditions related questions which included relationship with supervisor, turnover intent, coworker relationship were adapted from Kalliath and Beck (2001), Lichtenstein et al. (2004), Mohsin et al., (2013) and Fallon and Rutherford (2010).

Relationship with supervisor questions are "*my supervisor is respectful to me", "I am treated unfairly at work", "I am treated with respect by my employer".* One turnover intent question was *"If I had a choice, I would not do this job".* Coworker relationship questions include *"I am treated with respect by my coworkers".*

Table 6 below provides a detailed description about the literature from which measures of physical workload, ergonomic problems, prevalence of pain and work conditions of hotel housekeepers were used to formulate the survey.

Table 6 Summary table of questionnaires used for the research study

Author	Measure	Sample Item
Krause et. al, (1999)	Physical workload	"During a typical work day, how many rooms are you assigned? On average- how long does it take to clean them?" Check out rooms, "How many per day?", Minimum and maximum time to clean.
Krause et. al,(1999)	Ergonomic problems	"How big a problem are these issues for you at work"? Broken linen cart, wet towels are heavy, vacuum cleaner is broken or heavy, cleaning supplies do not clean well, cleaning supplies irritate my eyes, not enough tools (mops, gloves, brooms) and long trip to linen room.
Krause et al., (2005)	Prevalence of Pain	"During the past four weeks, which did you experience as a result of your work?" Musculoskeletal injuries included pain in 12 regions namely hips, knees, legs, ankles, wrists, lower arms, upper arms, head, chest, neck, upper back, lower back. Other prevalence of questions included burning in eyes, burning on my skin, open wounds, burns from chemicals, sprains, fractured bones, dislocation of joints, sickness or fatigue, falls, risk to pregnancy and losing fingerprints.
Kalliath, Beck (2001), Lichtenstein et al. (2004), Mohsin et al., (2013), Fallon, and Rutherford (2010).	Work Conditions	Relationship with supervisor questions are "my supervisor is respectful to me", "I am treated unfairly at work", "I am treated with respect by my employer". Turnover intent question was "If I had a choice, I would not do this job" Coworker relationship questions include "I am treated with respect by my coworkers".
Karasek, 1998	Psychosocial , Time pressure and individual job characteristics	Psychosocial job factors (psychological demands, supervisor support and coworker support) Time pressure questions (skip lunch, take shorter breaks, work longer hours) Individual worker characteristics like age and health behaviors (smoking, eating junk foods etc.)

3.4 Data Analysis

In order to answer the research questions, the data was entered into Statistical Package for Social Sciences (SPSS), Version 23. Data from the sample of the survey collected from 177 hotel housekeepers in Orlando region were imported into SPSS. Before starting any analysis, the data was explored for incomplete surveys, errors and outliers. The scale of the data was compressed for better data analysis results. Furthermore, for accuracy of data analysis, the number of years worked as hotel housekeepers were grouped into three namely up to two years, 2-10 years and over 10 years. Also, this helps to compare the three groups among hotel housekeepers in Orlando. Second, descriptive analysis was completed to understand the sample collected. Next Chi-Square was used to identify physical workload then ergonomic problems and finally prevalence of pain. The next chapter will discuss the descriptive, frequencies, Chi-square and T-tests that were performed to answer each of the research questions and results of these analysis recorded.

CHAPTER 4: FINDINGS

4.1 Introduction

This chapter presents the findings of the study and the implications for improved health and safety for hotel housekeepers in the Orlando area. As noted, all information used in this study was derived from questionnaire data. Descriptive statistics are used to provide an overview about the respondents with the Introduction providing an overview of the hypotheses tested. Responses from 177 study participants were used for this study with the findings of the descriptive statistics for the sample profile, chi square and t-test analysis mentioned below. The Statistical program, SPSS version 23 was used to perform the analysis conducted throughout this chapter. The general findings of the study are discussed in the following sections.

4.2 Descriptive Statistics

4.2.1 Sample Profile

The sample of the study comprised of 91% females and 7.9% males, which is typical of the situation for most hotels in the sector (Krause, Scherzer, & Rugulies, 2005; Buchanan et al., 2010; Costen, Cliath, & Woods, 2002). With regard to age (years), the sample is divided into three groups namely, '20-29', '30-39' and '40-69'. Similarly, country of origin was divided into four groups: Haiti, Puerto Rico, US and other. Furthermore, the race was classified as either Black or Hispanic. Age of the respondents are 62.1% between 40-69 years while 23.7% and 9.6% are in the age group 30-39 years and 20-29 years respectively. With regard to country of origin, the majority of the respondents

are from Haiti (38.4%) followed by Puerto Rico (20.9%) and other countries in the Caribbean islands (27.1%). Only 9.6% of respondents originated from the US. The race of the respondents was 51.4% Hispanic followed by 37.9% Black and 3.4% White. Furthermore, 41.8%, which is the majority of the respondents reported working between 2-10 years in the housekeeping, while 34.5% of respondents reported working over 10 years and 19.2% respondents reported working up to 2 years in the housekeeping department. The descriptive statistics of age, age group, country of origin, race and number of years worked as hotel housekeeper are shown below.

Table 7 Personal Descriptive Statistics

		Frequency	**%**
Gender	Female	161	91
	Male	14	7.9
	Total	175	98.9
Age (years)	20-29	17	9.6
	30-39	42	23.7
	40-69	110	62.1
	Total	169	95.5
Country of Origin	Haiti	68	38.4
	Puerto Rico	37	20.9
	US	17	9.6
	Others	48	27.1
	Total	170	96
Race	White	6	3.4
	Black	67	37.9
	Hispanic	91	51.4
	Total	164	92.7

		Frequency	%
Number of years worked as hotel housekeeper	Up to 2 years	34	19.2
	2-10 years	74	41.8
	Over 10 years	61	34.5
	Total	169	95.5

Note: Sub categories may not total 177 because of missing data.

4.2.2 Wages

The salary earned by housekeepers varies with $8.20 being the minimum and $15.75 being the maximum with a mean salary of $11.07/ hour. Out of 177 respondents, only 49 respondents reported receiving tips per week. The mean tips earned per week is $6.09 as evident in Table 8.

Table 8 Pay and Tips Descriptive Statistics

	N	Minimum	Maximum	Mean
Pay/hour	174	$8.20	$15.75	$11.068
Tips/week	170	0	$100	$6.09

Note: Sub categories may not total 177 because of missing data

4.2.3 Workload and Work conditions

The responses for workload are as follows, 10.2%, the largest percent of the respondent's clean four check-out rooms followed by 8.5% who clean eight and five check-out rooms

respectively on a typical workday. However, 6.8% of respondents clean 16 check-out room on a typical work day. Additionally, 11.3% of the respondents clean four occupied rooms and 8.5% of respondents clean 18 occupied rooms on a typical work day. Out of the total respondents, 67.2% clean one VIP room whereas 8.5% are not assigned VIP rooms on a typical workday. The descriptive statistics of workload for check out rooms (when the guest has checked out), occupied rooms and VIP rooms is mentioned below.

Table 9 Workload

		Frequency	%
Check-out rooms workload	4.00	18	10.2
	16.00	12	6.8
Occupied rooms workload	4.00	20	11.3
	18.00	15	8.5
VIP rooms workload	.00	15	8.5
	1.00	119	67.2
	2.00	12	6.8

Hotel housekeepers were asked about undesirable work conditions faced in the past four weeks. Out of the total respondents, 42.9% skipped lunch 1-5 times and 20.3% skipped lunch more than 20 times in the past four weeks. Similarly, 45.2% of hotel housekeepers worked longer hours to finish assigned work for the day. A small but significant percentage of hotel housekeepers, 1.1% were reprimanded more than 20 times for reporting work related injury in the past four weeks of work. Out of the total respondents, 41.2% of hotel housekeepers clean after sick people who stayed in the room between 1-5 times and 14.7% cleaned after sick more than 20 times in the past four weeks. Similarly, 51.4% found needles/syringes in the trash or bed linens between 1-5 times and

6.2% more than 20 times. A large percentage of hotel housekeepers, 26% were put on light duty between 1-5 times in past four weeks.

Table 10 Work Conditions

	Skip Lunch	Work Long hrs.	Reprimand	Rotate furniture alone	Light Duty	Clean Bugs	Clean after sick	Needles	Disciplined	Delay Bathroom
1-5 times %	42.9	45.2	19.2	33.3	26.0	32.2	41.2	51.4	28.8	29.9
More than 20 times %	20.3	9.0	1.1	6.2	-	23.2	14.7	6.2	3.4	9.6

Housekeepers were asked additional questions about undesirable work conditions in the past four weeks. Out of the total respondents, 85.3%, a large percentage of hotel housekeepers, agree that they have constant time pressure due to heavy workload. Similarly, 80.8% hotel housekeepers agree they do not get enough time off from work to get the rest needed. However, only 39% agree that the salary they make is not enough to have a decent life and only 39% agree that their supervisor is respectful. On the other hand, 62.1% agree that their supervisor shows favoritism and 59.3% agree that they are treated unfairly at work.

Table 11 Work Conditions Continued

	Agree %	Disagree %
Constant pressure	85.3	14.7
No time off from work	80.8	19.2
Fear losing job	67.2	32.2
Time pressure to finish rooms	86.4	12.4
Salary is enough	39	60.5
Not do this job	77.4	21.5
Respect by employer	50.3	46.9
Treated unfairly at work	59.3	39
Supervisor respectful	39	57.1
Supervisor shows favoritism	62.1	36.2
Respect by coworkers	78.5	20.3
Discriminated because of race	53.1	46.3

4.2.4 Equipment and Supplies

Hotel housekeepers face a number of ergonomic issues on a daily basis. Over 59.9%, largest percentage of hotel housekeepers, face issues with their vacuum cleaners being broken or too heavy. Over 54.2% of respondents mentioned that the cleaning supplies provided do not clean well. As evident in Table 12, 29.4% respondents stated that it is a very long trip to take soiled linens to linen rooms.

Table 12 Ergonomic issues, which are a big problem for hotel housekeepers'

	Frequency	%
Linen cart (metro) is too heavy or broken, making it difficult to handle	89	50.3
Wet Towels, linen are too heavy	80	45.2
Vacuum cleaner is too heavy or broken	106	59.9
Cleaning supplies I use do not clean well	96	54.2
Cleaning supplies I use irritate my skin or eyes	58	32.8
I do not have enough tools (i.e. mops, ergo, bed wedge, gloves and broom)	59	33.3
It is a very long trip to take soiled linens to linen room	52	29.4

4.2.5 Health & Safety

To understand the health and safety guidelines followed in the hotel, hotel housekeepers were asked if the hotel posted safety guidelines on the bulletin board, 78% responded 'yes', 12.4% responded 'no' and 8.5 % don't know or haven't seen anything. Furthermore, the housekeepers were asked about the way things were handled if someone is injured at the workplace, 48.6% hotel housekeepers mentioned that every injury is thoroughly investigated and action is taken to prevent future injuries. Additionally, 46.3% mentioned that the most serious injuries are investigated and action is taken, 18.6% believe injuries are never investigated and action is taken and 52% responded employees receive a reprimand. Health and safety in the workplace is important for housekeeping department, to understand health and safety of the respondents in depth the following questions were asked.

Out of the total respondents, 59.8% believe *Workplace does not respond to suggestions to*

improve health safety. Similarly, 75% of hotel housekeepers believe *finishing rooms quickly is considered more important than health/ safety* and 70.1% believe *management sometimes ignores health and safety procedures.* Furthermore, 50.9% of hotel housekeepers disagree that *management always responds quickly to health and safety concerns* and 61.4% agree that *management is only concerned about health and safety after there has been an accident.* Similarly, 62.2% respondents agree that *management expects me to break health and safety rules to get the job done* and 58.5% of respondents agree that *management does not care about health and safety.* Furthermore, 47.2% disagree that *they are encouraged to report work-related injuries,* 71.6% agree that *they get coaching if they report work related injuries,* 57.6% believe *they will receive a reprimand, if they report work related injury* and 47.5% believe *they may get fired if they report multiple work related injuries.*

4.3 Worker Health

To understand the injuries on different regions of the housekeeper's bodies, the prevalence of pain among housekeepers was studied. Out of the total respondents, 32.8% respondents experience "severe" pain in the upper back and 31.6% experience "severe" pain in the lower back. Over 29.9% experience "severe" pain in the neck. Hotel housekeepers face severe pain in the below mentioned regions of the body as shown in Table 13.

Table 13 Prevalence of Pain which are severe for hotel housekeepers

	Frequency	%
Hips	38	21.5
Knees	39	22
Legs	40	22.6
Hands	39	22
Ankles	45	25.4
Elbows	45	25.4
Upper Arms	46	26
Neck	53	29.9
Upper Back	58	32.8
Lower Back	56	31.6

4.4 Injury

Out of the total respondents, 97.2% of the hotel housekeepers have health insurance, five respondents, a significant number, do not have health insurance. Hotel housekeepers were asked if they had any work related injury in the past year that required medical attention, over 18.1% responded ‘yes’. This is not a large percentage but sufficient to indicate occurrence of work related injuries. As a result, over 5.1% reported missing five days of work. Over 1.7% missed 10 days of work. Three respondents did not miss any days of work, which suggests that they continued working with the injury. One respondent missed 90 days of work. Figure 1 shows the number of days missed as result of injury.

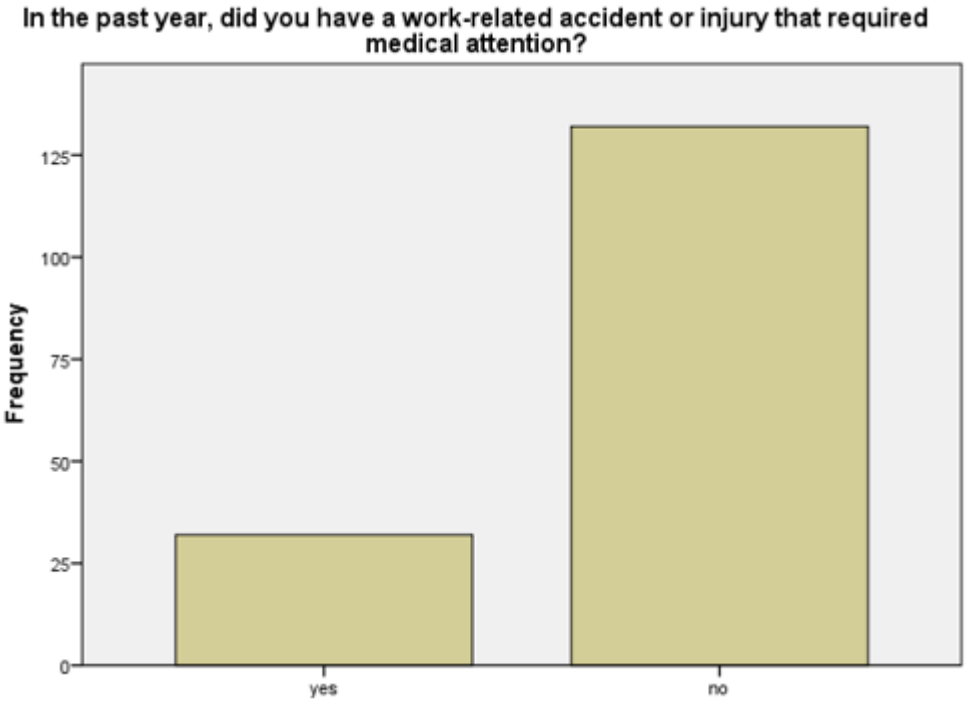


Figure 1 Work Related Injury

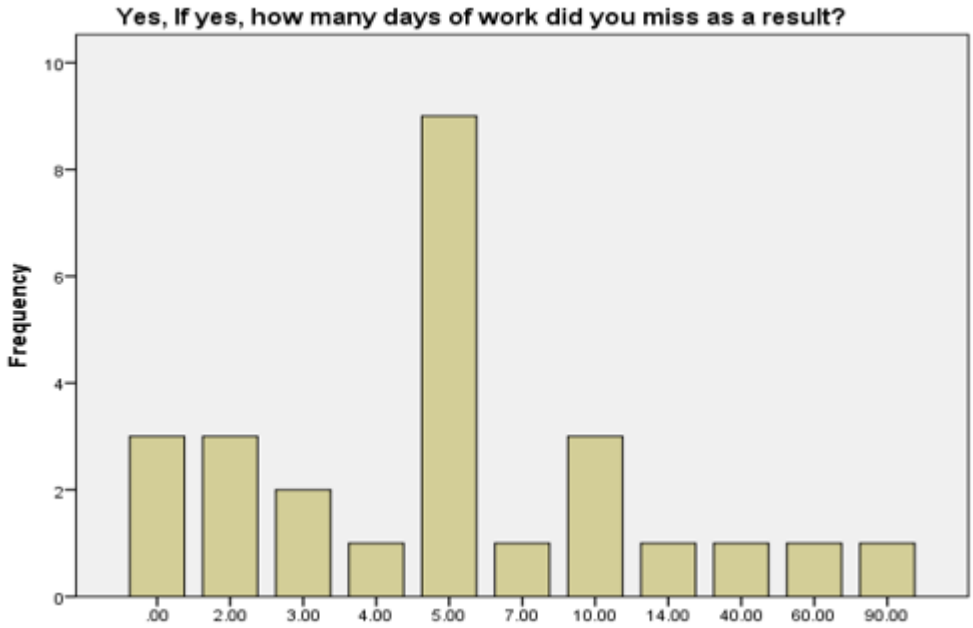


Figure 2 Work days missed

4.5 Injury Prevention(s)

The respondents were asked about the items used to prevent work-related injuries and illness/ illness/physical pain. Out of the total respondents, 58.2% reported that they never use back brace/ belt. Similarly, 58.8% never use knee pads. However, 52% reported always using cotton or rubber gloves and 21.5% reported never using cotton or rubber gloves. On the other hand, 50.3% never use eye protection (glasses, googles) and 52.5% never use masks. Out of the total respondents, 7.3% hotel housekeepers most commonly used aches and pain medication such as Ibuprofen and Advil. Other medication consumed by respondents were Tylenol, Motrin, Aspirin, Aleve, Alive and Tramadol.

Table 14 Items used to prevent injuries

	Back Brace/Belt	**Knee Pads**	**Cotton/ Rubber Gloves**	**Eye Protection (Goggles, Glasses)**	**Mask**	**Pain Medication**
Always %	8.5	4.0	52.0	13.0	9.0	18.6
Never %	58.2	58.8	21.5	50.3	52.5	24.9

Housekeepers were asked about the frequency of coping mechanisms used to handle work stress, over 12.4% of the respondents eat junk foods or comfort foods. Over 2.3% always drink alcoholic beverages but 73.4% never drink alcoholic beverages. Similarly, 2.8% always smoke but 82.5% never smoke. This could possibly suggest a response bias, as the respondents want a positive outlook about themselves. However, 28.8% of respondents always take analgesics. On the other hand, 63.3% a larger proportion of respondents never take tranquilizers, sedatives or other anti-

anxiety medication. Similarly, 39% and 48% never take over the counter and prescription medication respectively. However, 24.9% sometimes cry as a way to cope with work stress and 33.3% sometimes call in sick or stay away from work. Only 26.6% sometimes use humor as a way to cope with work stress. Almost equal proportion of respondents always and never spend more time in religious activities, 15.8% and 20.3%. respectively as evident in Table 15.

Table 15 Ways to cope with work stress

	Always %	**Sometimes %**	**Never %**
Comfort Foods	12.4	16.9	36.7
Alcohol	2.3	10.7	73.4
Smoke	2.8	5.1	82.5
Analgesics	28.8	19.2	16.9
Sedatives	10.2	13.0	63.3
Over the counter medication	24.9	16.4	39.0
Prescription medication	11.9	10.7	48.0
Cry	7.9	24.9	36.7
Call in sick	5.1	33.3	29.4
Humor	11.3	26.6	24.3
Church	15.8	24.3	20.3

The respondents were asked if they wanted to say something to the manager, 45.8% want respect, 13% want fair treatment, 4% want their concerns heard, 17.5% want less work, 0.6% want to quit work and 5.1% want more money. The hotel housekeepers were also asked about ways in which employer could improve work conditions, 76.7% want to be offered affordable family health insurance, 68.2% want fewer rooms, 67% want lighter workload to pregnant housekeepers, 61.9% believe break rooms should be provided, 73.3% want bathrooms in each building for housekeeper, 78.4 %want to be treated with respect, 73.3% believe cleaning tools should be provided and 61.9% want lighter mattress. The union staff will negotiate with the hotel managers about improvements

of work conditions.

Out of the total respondents, 85.3% are members of the union and 12.4% are not members of the union. Four responses were missing from the union membership data. Finally, the respondents were asked about wellness programs (employer funded health and fitness initiatives) in the hotel, 33.3% responded ‘yes’, 22% responded ‘no’, 1.1% responded ‘maybe’ and 6.8% ‘don’t know’. Now addressing each of the hypothesis

H1- There is a positive relationship between number of years worked as hotel housekeeper and workload.

H2- There is a positive relationship between ergonomic problems and time required to clean rooms by hotel housekeepers on a typical workday.

H3- There is a positive relationship between race and prevalence of pain among hotel housekeepers.

H4- There is a positive relationship between number of years worked as hotel housekeepers and wages.

The next sections analyses the relationship between the workload, wages among hotel housekeepers and number of years worked as a housekeeper. Additionally, the relationship between ergonomic problems and two groups of maximum time taken to clean rooms by hotel housekeepers is identified. Additionally, the following section aims to test the hypothesis.

4.6 Data Analysis Methods

4.6.1 Workload

The first hypothesis relates directly to workload and number of years worked as a hotel housekeeper. On a typical workday, 74% of those surveyed are given between 1-14 occupied rooms to clean. In addition, 19.2% of the respondents are given more than 15 occupied rooms to clean. Similarly, 79.1% are given 1-14 check out rooms to clean with 15.3% of those surveyed given more than 15 check-out rooms to clean. With regard to VIP rooms, rooms that are normally much larger and more intricate in terms of cleaning, 67.2% of respondents clean one VIP room, 6.8% clean two VIP rooms and 2.3% clean five VIP rooms on a typical workday.

To test the relationship between three groups of years worked as a hotel housekeeper and work load, chi square analysis was used. Among the respondents, 85.2% have *constant time pressure due to heavy workload* and 80.5% housekeepers *do not get enough time off from work to get the rest needed*. Similarly, 66.7% *do not take time off from work for fear of losing their job*. Over 87.4% work under a lot of time pressure to finish rooms each day. Among the respondents, 39.3% respondents agreed *the salary they make is enough to live a decent life*. Similarly, 78.6% agree *if given a choice they would not do this job*. *Treated with respect by employer* was agreed by 51.8% and 60.2% are *treated unfairly at work*. *Supervisor were respectful* was agreed by 41.1% housekeepers and 63.3% believe *supervisor shows favoritism when assigning work*. Among the respondents, 79.2% are *treated with respect by coworkers* and 52.7% are *discriminated against because of race*.

The Chi square results are not statistically significant which suggest all respondents share similar pattern of behavior. There is no positive relationship between number of years worked

as hotel housekeeper and workload. The hypothesis is not supported. However, the survey findings for *if I had a choice I would not do this job* is the closest to statistical significance (chi square sig. =0.091, df =4) but is not sufficient.

4.6.2 Ergonomic problems

The second hypothesis relates to maximum time taken to clean rooms caused by ergonomic problems. For check out rooms, hotel housekeepers took maximum time to clean ranging from '10-240 minutes' on a typical workday. For purpose of analysis, '*maximum time taken to clean check-rooms'* is divided into two groups namely '10-40 minutes' and 'over 40 minutes'. To find out the relationship between ergonomic problems and two groups of maximum time taken to clean check-out rooms, t-test analysis was conducted. For the independent samples test results, to test the variance of scores for the two groups ('10-40 minutes' and 'over 40 minutes') is the same, the Levene's sig. value for seven of the ergonomic issues faced at work is used.

The sig.value for Levene's test for '*linen cart is too heavy or broken making it difficult to handle*' is 0.058, so equal variances assumed. There is a significant difference between the two groups since the sig. (2 tailed) is 0.005, there is a significant difference in the mean scores for *heavy linen cart* between '10-40 minutes' and 'over 40 minutes'. Similarly, the Levene's sig. value for *linen are too heavy* is 0.591, so equal variances assumed. There is a significant difference in the mean scores for *linen are too heavy* between '10-40 minutes' and 'over 40 minutes' time taken by hotel housekeepers since the sig. (2 tailed) is 0.001. Furthermore, the Levene's sig. value for '*vacuum cleaner is too heavy or broken'* is 0.264, so equal variances assumed. There is a significant difference between the two groups of time taken since the sig. (2 tailed) is 0.00.

The Levene's sig. for '*cleaning supplies used do not clean well'* is 0.091, so equal variances assumed. There is a significant difference in the mean scores for *cleaning supplies not clean well* between the two groups. However, equal variances assumed for *cleaning supplies irritate eyes* since Levene's sig. value is 0.074 but sig. (2 tailed) is 0.495, which suggests there is no significant difference in the mean scores for cleaning supplies irritate eyes. The independent samples test results, to test the variance of scores for 'not enough tools such as mops, gloves' is 0.793 (Levene's sig. value), so equal variances assumed and the sig. (2 tailed) is 0.000 which suggests there is a statistical difference between the two groups of *time taken to clean rooms on not enough tools such as mops, gloves*. However, equal variances not assumed for '*long trip to take soiled linen to linen room'* and there is no significant difference between the two groups on '*long trip to take soiled linen to linen rooms*' as sig. (2 tailed) is 0.174. To conclude, heavy linen cart (t=2.850, df=159, sig. (2-tailed) =0.005), heavy linen (t=3.452, df=161, sig. (2 tailed) =0.001), broken vacuum cleaner (t=4.328, df=160, sig. (2 tailed) =0.001), cleaning supplies not clean well (t=6.519, df=161, sig. (2 tailed) =0.00), and not enough tools (mops, gloves) (t=3.598, df= 160, sig. (2 tailed) =0.00) are the reasons for the difference in time taken to clean check- out rooms.

Table 16 T-test for ergonomic problems and maximum time taken to clean check-out rooms

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Linen cart(metro) is too heavy or broken, making it difficult to handle.	Equal variances assumed	3.654	.058	2.850	159	.005
	Equal variances not assumed			2.583	35.890	.014
Wet towels, linens are too heavy.	Equal variances assumed	.290	.591	3.452	161	.001
	Equal variances not assumed			3.581	42.697	.001
Vacuum cleaner is too heavy or broken.	Equal variances assumed	1.254	.264	4.328	160	.000
	Equal variances not assumed			3.993	38.079	.000
Cleaning supplies I use do not clean well.	Equal variances assumed	2.896	.091	6.519	161	.000
	Equal variances not assumed			5.534	35.614	.000
Cleaning supplies I use irritate my skin or eyes.	Equal variances assumed	3.235	.074	.684	160	.495
	Equal variances not assumed			.737	44.818	.465
I do not have enough tools (i.e. mops, ergo, bed wedge, gloves, brooms)	Equal variances assumed	.069	.793	3.598	160	.000
	Equal variances not assumed			3.553	38.636	.001
It is very long trip to take soiled linens to linen room.	Equal variances assumed	5.065	.026	1.239	159	.217
	Equal variances not assumed			1.380	44.357	.174

For occupied rooms, hotel housekeepers took maximum time to clean ranging from '10-180 minutes' on a typical workday. For purpose of analysis, '*the maximum time taken to clean occupied rooms'* is divided into two groups namely '10-90 minutes' and 'over 90 minutes'. For the independent samples test results, to test the variance of scores for the two groups is the same, the Levene's sig. value for seven of the ergonomic issues faced at work is used. The Sig. value for Levene's test for *'linen cart is too heavy or broken making it difficult to handle'* is 0.026, so equal variances not assumed, there is no significant difference between two groups. Similarly, the Levene's sig. value for *linen are too heavy* is 0.641, so equal variances assumed. There is a

significant difference in the mean scores with the sig. (2 tailed) as 0.015 for 'linen are too heavy' between the two groups of time taken by hotel housekeepers. Furthermore, the Levene's sig. value for '*vacuum cleaner is too heavy or broken'* is 0.379, so equal variances assumed. There is no significant difference between the two groups of time taken since the sig. (2 tailed) is 0.30.

The Levene's sig. for '*cleaning supplies used do not clean well'* is 0.361, so equal variances assumed. There is a significant difference in the mean scores for '*cleaning supplies not clean well*' between the two groups since sig. (2 tailed) is 0.000. However, equal variances assumed for '*cleaning supplies irritate eyes'* since Levene's sig. value is 0.714 but sig. (2 tailed) is 0.565 which suggests there is no significant difference in the mean scores for *cleaning supplies irritate eyes*. The independent samples test results, to test the variance of scores for *'not enough tools such as mops, gloves'* is 0.359 (Levene's sig. value), so equal variances assumed and the sig. (2 tailed) is 0.005 which suggests there is a statistical difference between the two groups of time taken to clean rooms on '*not enough tools such as mops, gloves'*. However, equal variances assumed for *'long trip to take soiled linen to linen room*' suggests there is no significant difference between the two groups as sig. (2 tailed) is 0.647. To conclude, linens are too heavy (t=2.457, df =162, sig. (2 tailed) =0.049), cleaning supplies do not clean well and not enough tools (mops, ergo) (t=2.854, df =161, sig. (2 tailed) =0.005) are the reasons for the difference in time taken to clean check- out rooms.

Table 17 T-test for ergonomic problems and maximum time taken to clean occupied rooms

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Linen cart (metro) is too heavy or broken, making it difficult to handle.	Equal variances assumed	5.061	.026	1.985	160	.049
	Equal variances not assumed			1.424	7.3	.195
Wet towels, linens are too heavy.	Equal variances assumed	.218	.641	2.457	162	.015
	Equal variances not assumed			2.308	8.82	.047
Vacuum cleaner is too heavy or broken.	Equal variances assumed	.778	.379	1.040	161	.300
	Equal variances not assumed			1.152	9.21	.278
Cleaning supplies I use do not clean well.	Equal variances assumed	.840	.361	4.101	162	.000
	Equal variances not assumed			3.199	8.54	.012
Cleaning supplies I use irritate my skin or eyes.	Equal variances assumed	.134	.714	.576	161	.565
	Equal variances not assumed			.567	8.92	.584
I do not have enough tools (i.e. mops, ergo, bed wedge, gloves, brooms)	Equal variances assumed	.845	.359	2.854	161	.005
	Equal variances not assumed			3.028	7.84	.017
It is very long trip to take soiled linens to linen room.	Equal variances assumed	.318	.574	.458	160	.647
	Equal variances not assumed			.456	7.73	.661

For VIP rooms, hotel housekeepers took maximum time to clean ranging from ‘0-240 minutes’ on a typical workday. For purpose of analysis, the *maximum time taken to clean VIP rooms* is divided into two groups namely ‘0-120 minutes’ and ‘over 120 minutes’. To find out the relationship between ergonomic problems and two groups of maximum time taken to clean VIP rooms, t-test analysis was conducted. For the independent sample test results, to test the variance of scores for two groups is the same, Levene’s sig. value for seven of the ergonomic issues faced at work is used. For *linen cart is too heavy*, the sig. value for Levenes test is 0.002 so equal variances not assumed but the sig. (2 tailed) is 0.000 which suggests there is a significant difference

in the mean scores on *linen cart is too heavy* for each of the two groups. For *linens are too heavy*, the sig. value for Levenes test is 0.647 so equal variances assumed but the sig. (2 tailed) is not significant at 0.259. However, for *vacuum cleaner is broken*, the sig. value for Levenes test is 0.565 so equal variances assumed sig. (2 tailed) is significant at 0.003 which suggests that there is a statistically significant difference in the mean vacuum cleaner is broken scores for '0-120 minutes' and 'over 120 minutes'.

For *cleaning supplies do not clean well*, sig. value for Levene's test is 0.002 so equal variances not assumed but sig. (2 tailed) test is significant at 0.000 which suggests there is significant difference in the mean *cleaning supplies do not clean well* scores for '0-120 minutes' and 'over 120 minutes'. On the other hand, for *cleaning supplies irritate my eyes*, *do not have enough tools* (mops, gloves) and *very long trip to linen room* the Levene's sig. is 0.133, 0.610 and 0.330 but the sig. (2 tailed) value is not statistically significant at 0.544, 0.056 and 0.596 respectively. To conclude, linen cart is too heavy, vacuum cleaner is broken and cleaning supplies do not clean well are the reasons for the difference in maximum time taken to clean VIP rooms.

Table 18 T-test for ergonomic problems and maximum time taken to clean VIP rooms

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Linen cart (metro) is too heavy or broken, making it difficult to handle.	Equal variances assumed	10.191	.002	4.378	158	.000
	Equal variances not assumed			3.913	61.929	.000
Wet towels, linens are too heavy.	Equal variances assumed	.211	.647	1.133	160	.259
	Equal variances not assumed			1.136	80.319	.259
Vacuum cleaner is too heavy or broken.	Equal variances assumed	.333	.565	2.997	159	.003
	Equal variances not assumed			2.895	72.479	.005
Cleaning supplies I use do not clean well.	Equal variances assumed	9.902	.002	4.283	160	.000
	Equal variances not assumed			3.885	66.901	.000
Cleaning supplies I use irritate my skin or eyes.	Equal variances assumed	2.277	.133	.608	159	.544
	Equal variances not assumed			.632	83.741	.529
I do not have enough tools (i.e. mops, ergo, bed wedge, gloves, brooms)	Equal variances assumed	.261	.610	1.922	159	.056
	Equal variances not assumed			1.983	82.427	.051
It is very long trip to take soiled linens to linen room.	Equal variances assumed	.954	.330	.531	157	.596
	Equal variances not assumed			.544	81.880	.588

From the survey findings, it is clear that there is a positive relationship between maximum time taken to clean rooms and ergonomic problems such as linen cart is too heavy (t= 3.913, df =61.929, sig (2 tailed) = 0.000), vacuum cleaner is broken (t=2.997, df= 159, sig (2 tailed) =0.003) and cleaning supplies do not clean well (t= 0.608, df= 159, sig. (2 tailed) =0.544). The hypothesis is supported. The next sections discuss about the relationship between race and prevalence of pain.

4.6.3 Prevalence of Pain among Hotel Housekeepers

The third hypothesis explores the relationship between race and prevalence of pain among hotel housekeepers, chi square was used for analysis. This test compares the observed frequencies of cases that occur in each of the categories, the lowest expected frequency in any cell should be five or more, and 80 % of cells should have expected frequencies of five or more. Pain in hips was common among both groups, there being no significant difference in the proportion from Black housekeepers and Hispanic housekeepers. The same is true for pain in knees, legs, hands, ankles, elbows, upper arm, neck and head. However, *pain in chest* varies with 49.2% Black housekeepers experiencing *mild pain* and 34.1% Hispanics experiencing *mild pain* but is not statistically significant at 0.075. Similarly, *pain in upper back and lower back* varies with 25.4% Black housekeepers experiencing *severe upper back pain* and 40.4% Hispanic housekeepers experiencing *severe upper back pain* but is not statistically significant (chi square sig= 0.132, df= 2). Similarly, *pain in lower back* varies with 26.9% Back housekeepers experiencing *severe lower back pain* and 39.8% Hispanic housekeepers experiencing *severe lower back pain* but it is not statistically significant at 0.124.

Severe itching on skin was common among 13.5% Hispanics and 11.9% of Black housekeepers, which is statistically significant at 0.022. However, 11.9% Black hotel housekeepers have *severe pain from cuts* which is statistically significant (chi square sig= 0.031, df =2) and severe 13.4% *burn from chemicals* which is statistically significant (chi square sig= 0.044, df =2). Similarly, 43.9% Black housekeepers experience *mild sprains* and 23.3% Hispanic housekeepers experience *mild sprains* which is statistically significant (chi square sig= 0.024, df =2).

Table 19 Prevalence of pain among hotel housekeepers

	Black Mild %	Black Severe %	Black None %	Hispanic Mild %	Hispanic Severe %	Hispanic None %	Chi Square	df
Hips	62.7	19.4	17.9	58.1	25.6	16.3	0.665	2
Knees	65.6	20.3	14.1	53.9	27.0	19.1	0.349	2
Legs	63.1	20	16.9	54.5	28.4	17	0.465	2
Hands	64.6	21.5	13.8	60.0	24.4	15.6	0.843	2
Ankles	72.7	19.7	7.6	58.4	31.5	10.1	0.178	2
Elbows	55.4	26.2	18.5	48.9	28.9	22.2	0.716	2
Upper Arms	53.0	30.3	16.7	50.6	27	22.5	0.660	2
Head	57.8	17.2	25	46.1	20.2	33.7	0.345	2
Chest	49.2	19.0	31.7	34.1	14.6	35.9	0.075	2
Neck	51.5	30.3	18.2	47.7	36	16.3	0.757	2
Upper Back	50.7	25.4	23.9	42.7	40.4	16.9	0.132	2
Lower Back	52.2	26.9	20.9	48.9	39.8	11.4	0.124	2
Eyes	57.6	12.1	30.3	30.0	12.2	57.8	0.001	2

	Black Mild %	Black Severe %	Black None %	Hispanic Mild %	Hispanic Severe %	Hispanic None %	Chi Square	df
Skin	49.3	11.9	38.8	28.1	13.5	58.4	0.022	2
Cuts	44.8	11.9	43.3	27.8	7.8	64.4	0.031	2
Burns from chemicals	43.3	13.4	43.3	25.6	12.2	62.2	0.044	2
Sprains	43.9	9.1	47.0	23.3	10.5	66.3	0.024	2
Bones	29.9	6	64.2	11.4	8	80.7	0.015	2
Joints	28.4	10.4	61.2	18.9	8.9	72.2	0.318	2
Fatigue	26.9	14.9	58.2	14.6	9.0	76.4	0.052	2
Slips	31.8	9.1	59.1	18.0	11.2	70.8	0.135	2
Pregnant	18.2	13.6	68.2 N/A	7.7	12.1	80.2 N/A	0.117	2
Finger Prints	26.6	7.8	65.6	21.6	13.6	64.8	0.469	2

Similarly, 29.9% of Black hotel housekeepers experienced *mild broken bones* and 11.4% of Hispanic hotel housekeepers experienced *mild broken bones* which is statistically significant (chi square=0.015, df=2). On the other hand, a larger proportion of Black hotel housekeepers, 14.9% *experienced severe fatigue or sickness* which is statistically significant (chi square sig. =0.052, df =2). Additionally, almost an equal proportion of Black and Hispanic housekeepers experience *slips and risk to pregnancy*, but this was found to be not statistically significant. The

hypothesis is partially supported. The findings of this study suggest a positive relationship with prevalence of pain and race (Black and Hispanic hotel housekeepers). The next section discusses the relationship between wages and years worked as hotel housekeepers.

4.6.4 Low Wage Hotel Housekeepers

The Mann-Whitney U Test is used to test for differences between number of years worked as hotel housekeepers in terms of wages earned. This test was used to test for differences between three independent groups on a continuous measure. The two variables for this test are one categorical variable, which is the three groups of years worked as hotel housekeepers and one continuous variable, which is wages, earned. The Mann-Whitney U test is an alternative to t-test of independence. From the output, the main values in the output are the z value and the significance level which is assymp. Sig. (2 tailed). The z value is -2.905 with the significance level (p) of p= 0.004. The result is significant since p value is less than 0.05. The mean rank for the group '2-10 years' is higher than 'up to 2 years'. The median values for each group are as follows for 'up to 2 years' work experience is $ 10, for '2-10 years' is $10.5 and 'over 10 years' is $12 as mentioned in Table 21.

Table 21 Pay per hour

Experience	N	Median
up to 2 years	34	$10.0000
2-10 years	74	$10.5000
over 10 years	58	$12.0000
Total	166	$10.5000

Similarly, the Mann-Whitney U test is used to test the differences between number of

years worked as hotel housekeepers in terms of wages earned. From the output the main valuesare the z value and the significance level which is asymp. Sig (2 tailed). The z value is -6.843 with significance level (p) of p= 0.000. The p value is less than 0.005 so the result is significant. The ranks Table 18 suggests that mean rank for ‘over 10 years’ is higher than ‘2-10 years’ suggesting that the group ‘over 10 years’ is higher than group ‘2-10 years’.

Furthermore, the Mann-Whitney U test is used to test the differences between number of years worked as hotel housekeepers in terms of wages earned. From the output, the main values in the output are the z value and the significance level, which is assymp sig. (2 tailed). The z value is -6.446 with significance level of (p) of p= 0.000. The result is significant since p value is less than 0.005. Table 21 specifies the answer to the question (*How much are you paid per hour?).* The ranks Table 21 suggests that mean rank for ‘over 10 years’ is more than ‘up to 2 years’ suggesting that the group ‘over 10 years’ earns higher wages than group ‘up to 2 years’. The wages differ in terms of number of years worked as hotel housekeeper. The more number of years of experience higher the wages earned. The hypothesis is supported. Moreover, future research can focus on the rate of wage increase as number of years worked as hotel housekeepers.

To make necessary changes in the housekeeping department, the following ways could improve work conditions. Over 95.5% believe increase of wages will help improve work conditions. Only 41.8% respondents want more breaks to rest compared to 61.6% want break rooms to be provided. Out of the total respondents, 62.7% do not want better floor design. Only 40.1% want fewer amenities placed in rooms. An almost equal percentage respondent require and do not require flexible work hours. Similarly, almost equal percentages of respondents requires

and not require day care services. Out of the total respondents, 56.8% do not want to be issued reprimands for work related injuries. However, 64.4% do not want to establish more fair point system. To conclude, 78% want to be treated with respect.

4.7 Summary of results

Four hypotheses were tested in this chapter using chi-square and t-test. The first hypothesis is the relationship between number of years worked as hotel housekeeper and undesirable work experience, which is not supported. The second hypothesis is supported, there is a positive relationship with ergonomic problems and time required to clean each room by housekeepers on a typical work day. The third hypothesis is partially supported as the results for 'burn from chemicals' was statistically significant. The fourth hypothesis is supported as there is a positive relationship with hotel housekeeper's wages and number of years worked as housekeeper.

4.7.1 Hypothesis and results

H1- There is a positive relationship between number of years worked as hotel housekeeper and workload- NOT SUPPORTED
H2- There is a positive relationship between ergonomic problems and time required to clean each room by hotel housekeepers on a typical work day- SUPPORTED
H3- There is a positive relationship between race and prevalence of pain among hotel housekeepers- PARTIALLY SUPPORTED
H4-There is a positive relationship with hotel housekeeper's wages and number of years worked as hotel housekeeper- SUPPORTED

CHAPTER 5: DISCUSSION AND CONCLUSION

This chapter synthesis the findings of hotel housekeeper's physical workload, ergonomic problems and prevalence of pain with the previous literature review. With the purpose of this study, being to explore relationships between number of years worked as hotel housekeeper and workload and work conditions and wages among hotel housekeepers. Additionally, the purpose is to find the relationship between ergonomic problems and maximum time taken to clean rooms on a typical workday. Also, the purpose is to investigate the relationship between race and prevalence of pain among hotel housekeepers. Furthermore, research findings provide recommendations for hotel housekeepers. The research study contribution is to the literature of working conditions of hotel housekeepers in the Orlando. This chapter ends with the discussion of the limitations of the study and suggestions for future research.

5.1 Summary of study and methods

The fundamentals of this study are to understand physical workload, ergonomic problems and prevalence of pain of low wage hotel housekeepers in Orlando. The need of the study is to explore the health and safety standards of hotel housekeepers to gain an understanding that will lead to recommendations for minimizing injury risks. It is critical for housekeepers to have safe working conditions, face limited ergonomic problems and get an opportunity to earn more wages.

Previous literature by Krause, Rugulies and Maslach (2010) collected 828 surveys from hotel housekeepers to study the imbalance of their efforts and rewards at work and self-rated

health of housekeepers working in Las Vegas. Another study by Sanon (2013) collected interviews from 27 Haitian immigrant hotel housekeepers working in Miami. With the collaboration of Unite Here, 177 responses from hotel housekeepers were collected for the present study. In other words, the Unite Here union workers conducted interviews in housekeeper's home to understand their working conditions and the surveys collected gave a brief description regarding the same. A detailed discussion about the union is as follows. Unite Here was formed in 2004 which joined two unions together which is Union of Needle traders, Industrial and Textile Employees (UNITE) and Hotel Employees and Restaurant Employees Union (HERE) (Unite Here, 2016). Major hotel chains, which contracted with the union, are famous casinos in Las Vegas such as Ceasers Palace, multi-national hotel chains and other famous resorts in US and Canada. Unite Here represents 75% of all non-managerial hotel employees in cities like San Francisco, 23 major hotel chains have contracts with the Unite Here union and they boast of diverse membership (Krause, 2005). The union works in identifying work hazards and bringing them to the employer's attention. According to Unite Here hotel cleaners work in poor conditions, work longer hours, paid low, lack benefits, high job turnover, low job control, ergonomic strains, chemical exposures and a wide variety of other physical and mental health risks (2006).

The union works to bring to light harmful working conditions for hotel housekeepers in the US and Canada. Sprains and strains are the most common housekeeping injury (Burgel, White, Gillen & Krause, 2010). One of the major goals of the union, Unite Here is to increase the well-being of hotel housekeepers. There is very little research about workplace issues of housekeepers in Orlando. Organizations should see housekeeper wellness as human capital

investment for improved organizational functioning.

This study outlines how the three groups of hotel housekeepers work experience perceive the attitude of management towards them. Previous researchers have studied the similar topic in various cities like Las Vegas but this research is based in Orlando. The current findings are similar to the findings of the literature review studies conducted in Las Vegas, Miami and New York (Buchanan et al., 2010; Sanon, 2013)

In previous literature, for instance it was observed pushing carts and bags and placing bags of wet linen on the carts should be enforced as a safety standard and staff should be trained to follow these standards at hotels (Mest, 2013). The current research findings add to the previous literature review as 50.3% hotel housekeepers found the linen cart is too heavy or broken, making it difficult to handle. Lighter housekeeping carts are better ergonomic fixes but the best solution would be to have a central place of access for room and bathroom amenities. By this approach, these carts will not be necessary, as most times these carts become full making it difficult to maneuver and hence avoiding injuries at workplaces (Mest, 2013). To bridge the gap of previous research, this study was conducted to investigate ergonomic problems in housekeeping department and its effect on housekeepers' work.

Additionally, in previous literature it was observed that, Ecolab, the distributor of cleaning products to these properties provided color-coded icons that could be learned easily by workers and printing instructions of product dispensing and usage in more than three languages for ease of understanding by housekeepers (Selwitz, 2001). The current study found that 54.2% hotel housekeepers believe cleaning supplies used do not clean well and 32.8% hotel housekeepers cleaning supplies used irritate skin and eyes. The possible reason for this finding

is the hotel housekeepers are not given instructions about using the cleaning supplies. Another reason could be the organization has not replenished cleaning supplies. Since only 13% of hotel housekeepers always use eye protection like goggles and glasses, there is a large percentage of housekeepers facing eye irritation with cleaning supplies.

There are different strategies to avoid workplace injuries. In this study, one strategy used by housekeepers is the use of items to prevent injuries such as kneepads, rubber gloves and mask. Previous literature recommends the use of items like mattress lifter and tools to put pillowcases onto pillows (Mest, 2013). For better efficiency as suggested by Jones (2007), the gloves are soaked in light oil so that while cleaning dust is easily removed. This also helps ease the effort used to clean rooms. Solutions to alleviate the pains of bed making is using tools such as mattress lifter which can help reduce the fatigue involved in lifting mattress. Another alternative to using a mattress lifter is the use of fitted sheets that are easier to fold under a mattress without lifting the bed at every corner and speeding the bed making process (Mest, 2013, p.26). Cotton pillowcases shrink after a few washes making it difficult to put the pillow in manually, tools exist to hold pillow in place while pillowcase is pulled over them and hereafter reducing the effort in doing this task (Mest, 2013, p.27). The next section discusses the data analysis results in detail and discusses the recommendations that would help ease the work in the housekeeping department as requested by respondents.

5.2 Discussion of the results

5.2.1 Workload and work conditions

Previous literature suggests that if a housekeeper goes beyond 15 rooms per day then housekeeping management must deal with more injuries faced by housekeepers (Mest, 2013). The results from this study are consistent with the previous literature with 19.2% housekeeper's clean over 15 occupied rooms, 15.3% clean over 15 check-out rooms and 1.1% clean 6 VIP rooms on a typical workday. A large percentage of hotel housekeepers, 18.1% faced work related injury, which required medical attention in the past year. However, 37% of hotel housekeepers in Miami reported cleaning over 18 rooms on a typical workday (Sanon, 2013)

Constant time pressure due to heavy workload was common among hotel housekeepers irrespective of number of years worked. The literature suggests that physical workload influenced effort-reward imbalance and health concerns (Krause, Rugulies, & Maslach, 2010). Similarly, hotel housekeepers in Miami reported having too much work, which gave them stress and increased their blood pressure (Sanon, 2013). Refurbished rooms added an extra workload to hotel housekeepers in hotel brands like Hilton and Westin (Greenhouse, 2006). Housekeepers have to place extra amenities and clean teapots. The results of this study suggest that hotel housekeepers who worked for 'up to 2 years' strongly fear losing their job if they take time off work. On the other hand, evidence from the literature suggests that hotel housekeepers in Miami fear losing their jobs because hotels prefer agency-hired housekeepers. The reason for this practice is agency-hired housekeepers work for lower wages and no health benefits (Sanon, 2013).

5.2.2 Ergonomic problem

In the study by Seifert and Messing (2006) heavier mattresses and extra bedsheets caused housekeepers to put in a lot of effort for bed making. Vacuum cleaners if not working properly makes hotel housekeepers spend extra time trying to fix the problem (Raghubalan & Raghubalan, 2009). The result of this study is consistent with literature, which suggests that there is a significant difference between the maximum times taken to clean rooms on a typical workday. "Vacuum cleaner is too heavy or broken" was a big problem for 59.9% of hotel housekeepers. This could possibly suggest that the maximum time taken to clean checked out, occupied and VIP rooms is caused by dysfunctional vacuum cleaners.

Seifert and Messing (2006) observed that carts were too heavy and housekeepers were not involved in purchasing these carts in Montreal hotels. This is consistent with the results, which suggest that 50.3% of hotel housekeepers found that linen carts are too heavy or broken making them difficult to handle.

5.2.3 Prevalence of Pain

The highest number of musculoskeletal disorders caused by job stress were among housekeepers (Buchanan et al., 2010). A study on Haitian hotel housekeepers found that housekeepers were at high risk of hypertension, majority of hotel housekeepers in the current study are Haitian which is 38.4% of the total respondents. Hispanic women were found to have the highest injury rate compared to women of other ethnicities and male housekeepers (Buchanan et al., 2010).

The findings of this suggest that an equal proportion of Black and Hispanic hotel

housekeeper (12.2%) have severe burning in their eyes. A larger proportion of Hispanics (13.5%) have severe itching on skin. However, 11.9% of Black hotel housekeepers have severe pain from cuts and severe 13.4% burn from chemicals. Almost equally, Black (9.1%) and Hispanic (10.5%) hotel housekeepers experience severe sprains. Similarly, 6% Black hotel housekeepers and 8% Hispanic hotel housekeepers experienced severe broken bones On the other hand, a larger proportion of Black hotel housekeepers (14.9%) experienced severe fatigue or sickness The findings of this study suggest an association with prevalence of pain and both Black and Hispanic hotel housekeepers.

5.2.4 Wages

The results of the study suggest that there is difference in wages among the three groups of number of years worked as a hotel housekeeper. The median wage for 'up to 2 years' is $10, for '2-10 years' is $10.50 and 'over 10 years' is $12. However, the literature suggests that as per housekeeper's union the median US wage for housekeepers is $9.51 an hour (Shankman, 2014). The same study suggests that union demands of increase wages for unionized hotel housekeepers are met in cities with greater number of union hotels (Shankman, 2014). The possible reason for low wages in the current study is the rate of increase of wages is very low. The wages earned by all three groups of number of years worked as hotel housekeepers are in proximity to each other. However, there is a significant difference from t- test results. The wages do not vary as much for a new employee compared to an employee who has worked for 10 years.

5.3 Implications

5.3.1 Practical implications

If generalizing recommendations from single survey findings then it should be taken with caution. The reason for this is, increase of wages in Orlando cannot be compared to other states like Hawaii or New York neither cities like Miami. This survey offers long-term suggestions for housekeeping departments in Orlando. Housekeeping managers can learn from this study to ensure housekeepers practice safety standards during "under 2 years" number of years worked as hotel housekeeper to avoid injuries as the housekeepers enter "2-10 years" work.

This study can be an instrument to motivate management to practice diversity management and in-corporate policies and procedures for effective communication among hotel housekeepers and management. It will be better for the company to promote safe practices in the housekeeping department by facilitating training programs to ensure correct steps are followed at work. Furthermore, effective communication between hotel housekeepers and supervisors should be a goal of the housekeeping department as well as reinforcing positive work environment should be the objective of the department. Additionally, short-term work goals with a time frame should be set for hotel housekeepers to achieve. Hotel housekeepers should get an opportunity to share their ideas as well as concerns (Krause et al., 2010). Furthermore, managements approach to make sure housekeepers complete work should be by recognition for outstanding performance. Verbal acknowledgement in front of coworkers help motivate hotel housekeepers to give their best (Krause et al., 2005).

This study advocates prevention of injuries among hotel housekeepers. Organizations need to spend time and money on preventing injuries. There is limited research about the success with prevention strategies used by housekeeping management. Future research should replicate this study by comparing with other organizations, other cities and housekeeping staff working in cruise lines. Replication of this study will deepen our understanding of physical workload, ergonomic problems and prevalence of pain among hotel housekeepers in Orlando.

5.3.2 Limitations and Future Research

The major limitation of this study was the sample size. While 177 useable responses collected was acceptable, it was insufficient to test the hypothesis and to find out the major differences among the different groups. A total of 187 hotel housekeepers participated in the survey collection, but 10 surveys were missing data and were not suitable for data analysis. A larger sample would have made it easier to understand the relationships between years worked as hotel housekeeper and work experience and wages. Future research should attempt to collect larger samples of hotel housekeepers. This can be done by collecting samples from different cities. Another way could be to include cruise ship hotel housekeepers as well. Staff from different departments like food and beverage, cooks and front office can be included to study prevalence of pain as these job tasks are labor intensive as well.

Similarly, the makeup of the sample is comprised of hotel housekeepers working for one organization in one major city based in United States. Therefore, the findings cannot be generalized to the boarder population. Another limitation of the study is the utilization of

the survey design. Research on personality and individual differences relies heavily on self-report survey instruments and measures but self-report leads for response distortion. Response distortion refers to situations where respondents misrepresent their responses to self-report measures to make themselves look more attractive (Donavan, Dwight, & Schneider, 2013). Specifically, the responses to questions about ways to handle stress. Though the hotel housekeepers were informed that their responses were anonymous and confidential, a desire to represent themselves in a positive light may have affected the responses (Donovan et al., 2014).

While previous literature has proven validity and reliability, few studies have measured ergonomic problems and workload on a typical workday. Validity issues will stem from some measures on the survey. Few studies have measured rooms assigned on a typical workday, equipment, supplies you work with, and pain in different regions of the body. However, the multitude of scales used to measure these constructs, which led to a lengthy questionnaire, could have caused survey fatigue that negatively influenced the validity of the responses. Future research should focus on scale refinement across the different questions to develop parsimonious measures.

There are very few studies focused on physical workload, ergonomic problems and prevalence of pain among hotel housekeepers. The various questions discussed offer an opportunity to explore new questions. The findings of this study provides useful information for future researchers curious about hotel housekeepers work and health conditions which could lead to better understanding of this topic. In the future, hotel housekeepers will work in safe work environments, earn recognitions, and respect from employers, staff and customers.

APPENDIX A: IRB APPROVAL LETTER

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **Rachel Mammen**

Date: **March 22, 2017**

Dear Researcher:

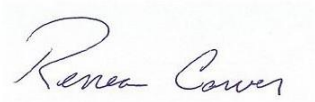
On 03/22/2017, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review:	Exempt Determination
Modification Type:	Updated study title on study documents
Project Title:	Assessment of physical workload, ergonomic problems and prevalence of pain among low wage hotel housekeepers in Orlando
Investigator:	Rachel Mammen
IRB Number:	SBE-16-12266
Funding Agency:	
Grant Title:	
Research ID:	ra468082

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:



Signature applied by Renea C Carver on 03/22/2017 02:58:16 PM EDT

IRB Coordinator

APPENDIX B: SURVEY INSTRUMENT

Survey Number: _____

Hotel Housekeeper Health and Safety Survey

Part I: Questions about you.

1. Employer ID (Perner): _____
2. How old are you? _____
3. Are you: ☐ Female ☐ Male
4. Which country were you born in? _____

5. What is your race/ethnicity?
   ___ White ___ Hispanic or Latino
   ___ Black/African American ___ Asian/Pacific Islander
   ___ Black/Caribbean ___ Multiracial/multiethnic
   ___ Other (*please specify*)_____

Part 2: Questions about your work experience.

6. How many years have you been working as a hotel housekeeper? _____
7. At what hotel do you work? _____
8. How much are you paid per hour? $_____
9. If you get tips from guests, approximately how much do you get per week? $_____ ☐ Don't get tips
10. Do you have health insurance? ☐ Yes ☐ No

Part 3: Questions about your work load and work conditions.

11. During a typical work day, how many rooms are you assigned? ***On average***—how long does it take to clean them?

A	***Check-out rooms***	How many per day?	Minimum time to clean:	Maximum:
B	***Occupied/stay-over rooms***	How many per day?	Minimum time to clean:	Maximum:
C	***General/VIP (deep clean) rooms***	How many per day?	Minimum time to clean:	Maximum:

12. How often did the following happen in the *past 4 weeks*?

	Check only one answer for each line.	Never	1-5 times	6-9 times	11-20 times	More than 20 times
A	I had to skip/shorten lunch or break to finish my assigned work for the day	☐	☐	☐	☐	☐
B	I had to work longer hours to finish my assigned work for the day	☐	☐	☐	☐	☐
C	I was reprimanded for reporting a work-related injury	☐	☐	☐	☐	☐
D	I was required to rotate/flip mattresses/move heavy furniture without help	☐	☐	☐	☐	☐
E	I was put on "light duty"	☐	☐	☐	☐	☐
F	I had to look for/I had to clean bedbugs or lice	☐	☐	☐	☐	☐
G	I had to clean after sick people who stayed in the room	☐	☐	☐	☐	☐
H	I found needles/syringes in the trash or bed linens	☐	☐	☐	☐	☐
I	I was threatened with discipline for not finishing my rooms	☐	☐	☐	☐	☐
J	I avoided/delayed going to the bathroom to finish my rooms	☐	☐	☐	☐	☐

13. How do you feel about your work?

	How much do you agree or disagree with these statements. Check only one answer for each line.	Strongly Disagree	Disagree	Agree	Strongly Agree
A	I have constant time pressure due to a heavy work load	☐	☐	☐	☐
B	I don't get enough time off from work to get the rest I need	☐	☐	☐	☐
C	I don't take time off from work for fear of losing my job	☐	☐	☐	☐
D	I work under a lot of time pressure to finish my rooms each day	☐	☐	☐	☐
E	The salary I make is enough for me to have a decent life	☐	☐	☐	☐
F	If I had a choice, I would not do this job	☐	☐	☐	☐
G	I am treated with respect by my employer	☐	☐	☐	☐
H	I am treated unfairly at work	☐	☐	☐	☐
I	My supervisor is respectful to me	☐	☐	☐	☐
J	My supervisor shows favoritism when assigning work	☐	☐	☐	☐
K	I am treated with respect by my co-workers	☐	☐	☐	☐
L	I am discriminated against because of my race or ethnicity	☐	☐	☐	☐

Part 4: Questions about equipment and supplies you work with.

14. How big a problem are these issues for you at work?

	Check only one answer for each line.	No problem at all	Very little problem	Somewhat of a problem	A big problem
A	Linen cart (metro) is too heavy or broken, making it difficult to handle	☐	☐	☐	☐
B	Wet towels/linens are too heavy	☐	☐	☐	☐
C	Vacuum cleaner is too heavy or broken	☐	☐	☐	☐
D	Cleaning supplies I use do not clean well	☐	☐	☐	☐
E	Cleaning supplies I use irritate my skin or eyes	☐	☐	☐	☐
F	I do not have enough tools (i.e., mops, ergo, bed wedge, gloves, brooms)	☐	☐	☐	☐
G	It is a very long trip to take soiled linens to linen room	☐	☐	☐	☐
H	Other, *please specify* _____	☐	☐	☐	☐

Part 5: Questions about health and safety at your workplace.

15. Has your hotel shared with you written safety guidelines or have you seen them posted on bulletin boards?
☐ Yes ☐ No ☐ Don't know/I have never seen any

16. What happens when someone is injured on the job at your workplace? (*Check all that apply*)
- ☐ Every injury is thoroughly investigated and action is taken to prevent future injuries.
- ☐ Only the most serious injuries are investigated and action is taken.
- ☐ Injuries are never investigated and no action is taken to prevent injuries.
- ☐ Employees receive a reprimand.

17. Below are some statements about health and safety at your workplace.

	Please indicate how much you agree or disagree with these statements. Check only one answer for each line.	Strongly Disagree	Disagree	Agree	Strongly Agree		Don't Know	Not Applicable
A	My workplace does not respond to suggestions to improve health/ safety	☐	☐	☐	☐		☐	☐
B	Finishing rooms quickly is considered more important than health/safety	☐	☐	☐	☐		☐	☐
C	Management sometimes ignores health and safety procedures	☐	☐	☐	☐		☐	☐
D	Management always responds quickly to health and safety concerns	☐	☐	☐	☐		☐	☐

	Please indicate how much you agree or disagree with these statements. Check only one answer for each line.	Strongly Disagree	Disagree	Agree	Strongly Agree		Don't Know	Not Applicable
E	Management is only concerned about health and safety *<u>after</u>* there has been an accident	☐	☐	☐	☐		☐	☐
F	Management expects me to break health and safety rules to get the job done	☐	☐	☐	☐		☐	☐
G	Management does not care about health and safety	☐	☐	☐	☐		☐	☐
H	I am encouraged to report work-related injuries	☐	☐	☐	☐		☐	☐
I	If I report a work-related injury, I get coaching	☐	☐	☐	☐		☐	☐
J	If I report a work-related injury, I receive a reprimand	☐	☐	☐	☐		☐	☐
K	If I report multiple work-related injuries, I may get fired	☐	☐	☐	☐		☐	☐

Part 6: Questions about your health.

18. During the ***past 4 weeks***, which did you experience ***as a result of your work***?

	Indicate <u>how severely</u> and check <u>only one</u> answer for each.	None	Very Mild	Mild	Moderate	Severe	Very Severe		Not Applicable
A	Pain in my hips	☐	☐	☐	☐	☐	☐		☐
B	Pain in my knees	☐	☐	☐	☐	☐	☐		☐
C	Pain in my legs	☐	☐	☐	☐	☐	☐		☐
D	Pain in my ankles and/or feet	☐	☐	☐	☐	☐	☐		☐
E	Pain in my hands, wrists, fingers	☐	☐	☐	☐	☐	☐		☐
F	Pain in my elbows and lower arms	☐	☐	☐	☐	☐	☐		☐
G	Pain in my elbows and upper arms	☐	☐	☐	☐	☐	☐		☐
H	Head (headaches)	☐	☐	☐	☐	☐	☐		☐
I	Pain in my chest or abdomen	☐	☐	☐	☐	☐	☐		☐
J	Pain in my neck/shoulder	☐	☐	☐	☐	☐	☐		☐
K	Pain in my upper back	☐	☐	☐	☐	☐	☐		☐
L	Pain in my lower back	☐	☐	☐	☐	☐	☐		☐
M	Pain or burning in my eyes	☐	☐	☐	☐	☐	☐		☐
N	Burning or itching on my skin	☐	☐	☐	☐	☐	☐		☐
O	Pain from cuts/open wounds	☐	☐	☐	☐	☐	☐		☐
P	Burns from chemicals	☐	☐	☐	☐	☐	☐		☐
Q	Sprains/strains	☐	☐	☐	☐	☐	☐		☐
R	Fractured/broken bones	☐	☐	☐	☐	☐	☐		☐
S	Dislocation of joints	☐	☐	☐	☐	☐	☐		☐
T	Passing out from fatigue or sickness	☐	☐	☐	☐	☐	☐		☐
U	Injury from slips/trips/falls	☐	☐	☐	☐	☐	☐		☐
V	My work presents a risk to my pregnancy	☐	☐	☐	☐	☐	☐		☐
W	I have noticed losing my fingerprints from cleaning chemicals	☐	☐	☐	☐	☐	☐		☐

19. In the past year, did you have a work-related accident or injury that required medical attention?

☐ Yes, *if yes, how many days of work did you miss as a result?* _____ days ☐ No

Part 7: Questions about how you deal with work-related injuries/ illnesses.

20. How often do you use items listed below to prevent work-related injuries/illnesses/physical pain?

	Check <u>only one</u> answer for each line.	Always	Most times	Sometimes	Rarely	Never
A	Back brace/belt	☐	☐	☐	☐	☐
B	Knee pads	☐	☐	☐	☐	☐
C	Cotton or rubber gloves	☐	☐	☐	☐	☐
D	Eye protection (glasses, goggles)	☐	☐	☐	☐	☐
E	Mask	☐	☐	☐	☐	☐
F	Pain medication (*name:*_____)	☐	☐	☐	☐	☐

21. ***How often*** do you do/use any of the following to deal with work stress?

Check only one answer for each line.		Always	Most times	Sometimes	Rarely	Never
A	Eat junk foods or comfort foods	☐	☐	☐	☐	☐
B	Drink alcoholic beverages	☐	☐	☐	☐	☐
C	Smoke	☐	☐	☐	☐	☐
D	Take analgesics (i.e., Aspirin, Tylenol, Motrin, etc.)	☐	☐	☐	☐	☐
E	Use tranquilizers, sedatives, or other anti-anxiety medication	☐	☐	☐	☐	☐
F	Use over-the-counter medication	☐	☐	☐	☐	☐
G	Use prescription medication *(name:_____)*	☐	☐	☐	☐	☐
H	Cry	☐	☐	☐	☐	☐
I	Call in sick to stay away from work	☐	☐	☐	☐	☐
J	Try not to take things so seriously, stay unemotional, use humor	☐	☐	☐	☐	☐
K	Spend more time in religious activity (going to church, praying)	☐	☐	☐	☐	☐
L	Other, *please specify:*_____	☐	☐	☐	☐	☐

22. Which of the following could your employer do to improve work conditions? (*Check all that apply*)	
☐ Increase wages	☐ Provide necessary cleaning tools
☐ Offer affordable family health insurance	☐ Have lighter mattresses
☐ Offer flexible work hours	☐ Have better floor design
☐ Offer day care service for all housekeepers who need it	☐ Have fewer room amenities in rooms
☐ Give lighter work assignment (fewer rooms)	☐ Not issue reprimands for reporting work-related injuries
☐ Give lighter workload to pregnant housekeepers	☐ Establish more fair point system
☐ Provide more breaks to rest	☐ Other, please specify: _____
☐ Provide break rooms	☐ *Other, please specify:* _____
☐ Provide bathrooms in each building for housekeepers	☐ *Other, please specify:* _____
☐ Treat housekeepers with respect	☐ *Other, please specify:* _____

23. Do you have a wellness program (employer funded initiatives which contain health and fitness initiatives) in the hotel you are currently working?
☐Yes ☐ No ☐ Maybe ☐ Don't know

24. Are you a member of the union? ☐Yes ☐ No

25. If you could say anything to your manager, what would you say?

Informed Consent to Participate in this survey on **Hotel Housekeeper Health and Safety**

I understand:

- The purpose of this study is to better understand health and safety of hotel housekeepers
- My participation is voluntary and I can refuse to answer any particular question
- My answers are confidential and will not be shared with my employer
- Risk of participation may be discomfort over the subject of health and safety in the workplace
- I can withdraw at any time without penalty

APPENDIX C: DEFENSE ANNOUNCEMENT

Announcing the Final Examination of Ms. Rachel Mammen for the degree of Masters in Science in Hospitality and Tourism Management

Date: Thursday, April 6, 2017

Time: 10:00 a.m.

Room: Rosen 221 (Faculty Conference Room)

Master's Thesis title: Assessment of physical workload, ergonomic problems and prevalence of pain among low wage hotel housekeepers in Orlando

In most hotels, the cleanliness of guestrooms is one of the most important service standards expected by customers. The role of the housekeeper is thus critical to service provision and hotel profitability. The hospitality industry is a major recruiter of low wage workers with the majority working in housekeeping departments. Problems pertaining to physical workload, ergonomic problems and the prevalence of pain are widespread among low-wage hotel housekeepers. In part magnified by a lack of support and respect from supervisors. Musculoskeletal injuries are the most common among hotel housekeepers due to the physical demands of the requirement of job. This study is focused on hotel housekeepers in Orlando. Orlando has witnessed an increase in out-of-state and international visitors in 2016 with 113 million visitors. This large tourist flux has resulted in high occupancies in hotels. This makes it an ideal location to study hotel housekeeper's health and safety standards in order to minimize injuries.

The purpose of this study is to focus on ergonomic problems and its impact on time taken to complete job tasks, and the potential relationship between number of years worked on workload and pain among hotel housekeepers. Additionally, the relationship between number of years worked as hotel housekeeper and wages will be identified. This study makes three important contributions towards understanding work and health related characteristics of low wage hotel housekeepers in Orlando region. Due to the nature of the research problem, a positivist quantitative approach was adopted. The survey instrument used in this study was adapted from validated survey instruments used in previous studies about the occupational health of hotel housekeepers.

Committee in Charge:

Dr. Alan Fyall

Dr. Sevil Sonmez

Dr. Denver

Severt

Outline of Studies

Major: Hospitality Management

Educational Career

BA in International Hospitality Management, 2011, Queen Margaret University, Edinburgh, UK.

Approved by Dr. Alan Fyall, Committee Chair, on March 6th, 2017

The public is welcome to attend.

REFERENCES

Amell, T. & Kumar, S. (2001). Work-related musculoskeletal disorders: Design as a preventative strategy. *Journal of Occupational Rehabilitation, 11*(4), 255-265.

Bearnard, B. P., Burt, S. E., Cole, L. L., Fairfield-Estill, C., Fine, L. J., Putz-Anderson, V., . . .Nelson, N. (1997). Musculoskeletal disorders and workplace factors. *National Institute of Occupational Safety and Health (NIOSH),* 97-141.

Bernhardt, A., Dresser, L., & Hatton, E. (2003). *Low-wage America: How employers are reshaping opportunity in the workplace*. Retrieved from http://books.google.com/books.

Bigos, S. J., Battie, M. C., Spengler, D. M., Fisher, L. D., Fordyce, W. E., Hansson, T. H., … Wortley, M. D. (1991). A prospective study of work perceptions and psychosocial factors affecting the report of back injury. *Spine, 16*(1), 1-6.

Bongers, P.M., de Winter, C. R., Kompier, M. A., & Hildebrandt, V. H. (1993). Psychosocial factors at work and musculoskeletal disease. *Scandinavian Journal of Work and Environment Health, 19,* 297-312.

Bourke, C. H., Harrell, C. S., & Neigh, G. N. (2012). Stress-induced sex differences: Adaptations mediated by the glucocorticoid receptor. *Hormones and Behavior, 62*(3), 210-218. doi: 10.1016/j.yhbeh.2012.02.024

Borg, V. & Kristensen, T.S. (2000). Social class and self-rated health: Can the gradient be explained by differences in life style or work environment? *Social Sciences Medicine,* (51), 1019-1030.

Buchanan, S., Vossenas, P., Krause, N., Moriarty, J., Frumin, E., Shimek, J. A. M.,… Punnett, L. (2010). Occupational injury disparities in the US hotel industry. *American Journal of*

Industrial Medicine, 53(2), 116-125. doi: 10.1002/ajim.20724

Burgel, B. J., White, M. C., Gillen, M., & Krause, N. (2010). Psychosocial work factors and shoulder pain in hotel room cleaners. *American Journal of Industrial Medicine, 53*(7), 743-756. doi: 10.1002/ajim.20832

Costen, W. M., Cliath, A. G., & Woods, R. H. (2002). Where are the racial and ethnic minorities in hotel management? Exploring the relationship between race and position in hotels. *Journal of Human Resources in Hospitality & Tourism*, *1*(2), 57-69.

Cox, A., Grimshaw, D., Carroll, M., & McBride, A. (2008). Reshaping internal labour markets in the National Health Service: New prospects for pay and training for lower skilled service workers? *Human Resource Management Journal*, *18*(4), 347-365. doi: 10.1111/j.1748-8583.2008.00073.x

Davis, K.G., & Heaney, C.A. (2000). The relationship between psychosocial work characteristics and low back pain: Underlying methodological issues. *Clinical Biomechanics, 15* (6), 389-406. http://dx.doi.org/10.1016/S0268-0033(99)00101-1

Deeney, C., & O'Sullivan, L. (2009). Work related psychosocial risks and musculoskeletal disorders: potential risk factors, causation and evaluation methods. *Work, 34(2),* 239-248. doi:10.3233/WOR-2009-0821

Dineen, C. (2016). Florida sees record tourism numbers in 2015. *Orlando Sentinel* Retrieved from http://www.orlandosentinel.com/business/consumer/os-florida-record- tourism-2015-20160218-story.html

Dineen, C. (2017). Florida welcomed nearly 113 million tourists in 2016. *Orlando Sentinel.* Retrieved from http://www.orlandosentinel.com/travel/os-bz-visit-florida-tourism-2016-

story.html

Donovan, J.J., Dwight, S.A., & Schneider, D. (2014). The impact of applicant faking on selection measures, hiring decisions, and employee performance. *Journal of Business and Psychology*, 29(3), 479-493.

Expantistan cost of living index. (2017). Cost of living in Honolulu, Hawaii, United States compared to Orlando, Florida, United States. Retrieved from: https: //www.expatistan.com/cost-of-living/comparison/orlando/honolulu

Faulkner, B., & Patiar, A. (1997). Workplace induced stress among operational staff in the hotel industry. *International Journal of Hospitality Management, 16*(1), 99-117.

Frumin, E. (2006). Workload-related musculoskeletal disorders among hotel housekeepers: employer records reveal a growing national problem, *UniteHere*, 1-14.

Friedman, L., & Forst, L. (2007). The impact of OSHA recordkeeping regulation changes on occupational injury and illness trends in the US: A time-series analysis. *Occupational & Environmental Medicine, 64*(7), 454-460. doi:10.1136/oem.2006.029322

Greenhouse, S. (2006, April 21). Hotel rooms get plusher, adding to maids' injuries. *New York Times*, pp. 1,2.

Howard, J., Chang, C. C., Schill, A. L., & Chosewood, L. C. (2016). NIOSH Response to the NIH Pathways to Prevention Workshop Recommendations. *Annals of Internal Medicine, 165*(4), 296-298. doi:10.7326/M16-0904

Hsieh, Y. C. J., Apostolopoulos, Y., & Sönmez, S. (2013). The world at work: Hotel cleaners. *Occupational and Environmental Medicine, 70*(5), 360-364. doi:10.1136/oemed-2012-100986

Hsu, S. Y., Ho, T. K., Tsai, J. J., & Wang, C. H. (2011). The evaluation mode of hotel housekeeping management. *African Journal of Business Management, 5*(34), 13249.

Jones, T. J. (2007). *Professional management of housekeeping operations* (5th ed.). Hoboken, NJ: John Wiley & Sons.

Jones, P., & Siag, A. (2009). A re-examination of the factors that influence productivity in hotels: A study of the housekeeping function. *Tourism and Hospitality Research, 9*(3), 224-234.

Kensbock, S., Jennings, G., Bailey, J., & Patiar, A. (2013). The lowest rung': Women room attendants' perceptions of five star hotels' operational hierarchies. *International Journal of Hospitality Management, 35,* 360-368.

Krause, N., Dasinger, L. K., & Neuhauser, F. (1998). Modified work and return to work: A review of the literature. *Journal of Occupational Rehabilitation, 8*(2), 113-139. doi:10.1023/A:1023015622987

Kerwin, D. M., & McCabe, K. (2011). Labor standards enforcement and low-wage immigrants: Creating an effective enforcement system. *Migration Policy Institute,* 1-68.

Krause, N., Rugulies, R., & Maslach, C. (2010). Effort–reward imbalance at work and self-rated health of Las Vegas hotel room cleaners. *American Journal of Industrial Medicine, 53*(4),372-386. doi:10.1002/ajim.20732

Krause, N., Scherzer, T., & Rugulies, R. (2005). Physical workload, work intensification, and prevalence of pain in low wage workers: Results from a participatory research project with hotel room cleaners in Las Vegas. *American Journal of Industrial Medicine, 48*(5), 326-337. doi:10.1002/ajim.20221

Kalliath, T. J. & Beck, A. (2001). Is the path to burnout and turnover paved by a lack of supervisory support? A structural equation. *New Zealand Journal of Psychology*, *30* (2), 72.

Karasek, R. A., Brisson, C., Kawakami, N., Houtman, I., Bongers, P. M. & Amick, B. (1998). The Job Content Questionnaire (JCQ): An instrument for internationally comparative assessments of psychosocial job characteristics. *Journal of Occupational Health and Psychology*, (3), 322-355. http://dx.doi.org/10.1037/1076-8998.3.4.322

Liladrie, S. (2010). Do not disturb/Please clean room: The invisible work and real pain of hotel housekeepers in the GTA. *CERIS-the Ontario Metropolis Centre*, 1-68.

Landers, M & Maguire, L. (2004). Effects of a work injury prevention program for housekeeping in the hotel industry. *Journal of Prevention, Assessment & Rehabilitation*, *22*(3), 239-246.

Lee, P. T., & Krause, N. (2002). The Impact of a Worker Health Study on Working Conditions. *Journal of Public Health Policy*, *23*(3), 268-285. doi: 10.2307/3343224

Lichtenstein, R., Alexander, J. A., McCarthy, J. F., & Wells, R. (2004). Status differences in cross-functional teams: Effects on individual member participation, job satisfaction, and intent to quit. *Journal of Health and Social Behavior*, *45*(3), 322-335.doi: 10.1177/002214650404500306

Mest, C.E. (2013). Caring for housekeepers preventing injury. *Hotel Management*, *228*(13), 26-28.

Montross, C. (2013). The elephant in the room: Preventing housekeeping injuries. *Executive Housekeeping Today*, 16-19.

Manoharan, A., Gross, M. J., & Sardeshmukh, S. R. (2014). Identity-conscious vs identity-blind: Hotel managers' use of formal and informal diversity management practices. *International Journal of Hospitality Management, 41*, 1-9. doi: 10.1016/j.ijhm.2014.04.007

Mohsin, A., Lengler, J., & Kumar, B. (2013). Exploring the antecedents of intentions to leave the job: The case of luxury hotel staff. *International Journal of Hospitality Management, 35*, 48-58. doi: 10.1016/j.ijhm.2013.05.002

Makulowich, G. S. (1996). OSHA seeks comments from health care and other "high hazard" industries on best way to report injury and illness. *AIDS Patient Care and Standards, 10*(2), 136-137.

National Institute for Occupational Safety and Health. (2002). *National Institute for Occupational Safety and Health.* Retrieved from http://www2.cdc.gov/NORA/noratopictemp.asp?rscharea=spr

Ohlin, J. B., & West, J. J. (1993). An analysis of the effect of fringe benefit offerings on the turnover of hourly housekeeping workers in the hotel industry. *International Journal of Hospitality Management, 12*(4), 323-336.

Onsøyen, L. E., Mykletun, R. J., & Steiro, T. J. (2009). Silenced and invisible: The work-experience of room-attendants in Norwegian hotels. *Scandinavian Journal of Hospitality and Tourism, 9*(1), 81-102.

Oshins, A., & Johnson, T. (1992). Hotels and risk management. *Risk Management, 39*(3), 62.

Oxenbridge, S., & Moensted, M. L. (2011). The relationship between payment systems, work intensification and health and safety outcomes: A study of hotel room attendants. *Policy*

and Practice in Health and Safety, *9*(2), 7-26. http://dx.doi.org/10.1080/14774003.2011.11667759

Pallant, J. (2015). *SPSS Survival Manual: A step by step guide to data analysis using IBM SPSS* (5th ed.). US: Mc Graw Hill Education.

Powell, P. H., & Watson, D. (2006). Service unseen: The hotel room attendant at work. *International Journal of Hospitality Management*, *25*(2), 297-312.

Prajogo, D. I. (2016). The Strategic Fit between Innovation Strategies and Business Environment in Delivering Business Performance. *International Journal of Production Economics*, *171*, 241-249. http://dx.doi.org/10.1016/j.ijpe.2015.07.037

PR, N. (2014, November 3). IEHA and Kimberly-Clark Professional Launch New Program to Recognize Exceptional Housekeeping Professionals. *PR Newswire US*. Retrieved from http://www.prnewswire.com

Premji, S., & Krause, N. (2010). Disparities by ethnicity, language, and immigrant status in occupational health experiences among Las Vegas hotel room cleaners. *American Journal of Industrial Medicine*, *53*(10), 960-975. doi: 10.1002/ajim.20860

Payscale,Inc. (2017). Housekeeper, Hotel Salary (United States). Retrieved from: http://www.payscale.com/research/US/Job=Housekeeper,_Hospital/Hourly_Rate

Rutherford, D. G., & O'Fallon, M. J. (Eds.). (2007). *Hotel management and operations*.Hoboken, N.J.: John Wiley.

Raghubalan, G., & Raghubalan, S. (2009). *Hotel Housekeeping: Operations and Management*.Oxford, UK: Oxford University Press.

Sanon, M. (2013). Hotel housekeeping work influences on hypertension management. *American*

Journal of Industrial Medicine, 56(12), 1402-1413. doi:10.1002/ajim.22209

Sanon, M. A. V. (2014). Agency-hired hotel housekeepers: an at-risk group for adverse health outcomes. *Workplace health & safety*, *62*(2), 81-85.

Scherzer, T., Rugulies, R., & Krause, N. (2005). Work-related pain and injury and barriers to workers' compensation among Las Vegas hotel room cleaners. *American Journal of Public Health, 95*(3), 483-488. doi: 10.2105/AJPH.2003.033266

Schleifer, L., Ley, R., & Spalding, T. (2002). A hyperventilation theory of job stress and musculoskeletal disorders. *American Journal of Industrial Medicine, 41*(5), 420-432. doi: 10.1002/ajim.10061

Shankman, S. (2014). *Housekeepers labor concerns extend far beyond too few tips.* Retrieved from https://skift.com/2014/09/17/housekeepers-labor-concerns-extend-far-beyond-too-few-tips/

Sengupta, I. & Baldwin, M.L. (2013). Workers Compensation: Benefits, Coverage and Cost, 2013. *National Academy of Social Insurance,* 1-74. Retrieved from https://www.nasi.org/sites/default/files/research/NASI_Work_Comp_Year_2015.pdf

Seifert, A. M., & Messing, K. (2006). Cleaning up after globalization: An ergonomic analysis of work activity of hotel cleaners. *Antipode, 38*(3), 557-578.

Selwitz, R. (2001). Safety training valuable to housekeepers, hotels. *Hotel & Motel Management, 216* (7), 54-55.

Stellman, J. M. (1998). *Encyclopedia of occupational health and safety*. (4th ed.). Geneva, Switzerland: International Labor Organization. Retrieved from https://books.google.com/books

Sturman, C. M. (2006). A new method for measuring housekeeping performance consistency. *Cornell Hospitality Report. 6*(11), 1-12.

Thompson, C. A. (2016). New OSHA document reviews hazardous-drug safety for employees. *American Journal of Health-System Pharmacy, 73*(16), 1204-1205. doi:10.2146/news160050

Tufts, S. (2009). Hospitality unionism and labour market adjustment: Toward Schumpeterian unionism*? Geoforum*, *40*(6), 980-990. doi:10.1016/j.geoforum.2009.08.008

UniteHere (2016). *UniteHere!* Retrieved from http://unitehere.org/

Warhurst, C., Lloyd, C., & Dutton, E. (2008). The national minimum wage, low pay and the UK hotel industry: The case of room attendants. *Sociology, 42*(6), 1228-1236.

Wells, M. J. (2000). Unionization and immigrant incorporation in San Francisco hotels. *Social Problems*, 241-265.

Wilson, J. R. (2000). Fundamentals of ergonomics in theory and practice. *Applied Ergonomics*, *31*, 557-567. doi:10.1016/S0003-6870(00)00034-X

Whitla, P., Walters, P. G., & Davies, H. (2007). Global strategies in the international hotel industry. *International Journal of Hospitality Management, 26*(4), 777-792. doi: 10.1016/j.ijhm.2006.08.001

Whitmore, J. (2003). *Coaching for performance*. London: Nicholas Brealey Publishing. Woods, R. H., & Viehland, D. (2000). Women in hotel management. *Cornell Hospitality Quarterly, 41*(5), 51.

Yap, M. T. (2011). Hotel housekeeping occupational stressors in Norway. *Tourism & Hospitality Management, 17*(2), 291-294.