

Knowledge, Attitudes, Behaviors and Environmental Health Needs
of Latinas in Cleaning Occupations

By

Erin Speiser Ihde

Dissertation Committee:

Dr. Genevieve Pinto Zipp (Chair)

Dr. Deborah A. DeLuca

Dr. Ana Paula Cupertino

Submitted in partial fulfillment of the requirements for the degree of

Doctor of Philosophy of Health Sciences

Seton Hall University

2020

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Chair: Genevieve Pinto Zipp

(enter signature & date) Genevieve Zipp 8/29/20

Committee Member: Paula Cupertino

(enter signature & date) Paula Cupertino 8/29/20

Committee Member: Deborah A. DeLuca

(enter signature & date) Deborah A. DeLuca 8/29/20

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ACKNOWLEDGEMENTS

I want to thank my dissertation committee for all of the insightful feedback and support throughout the dissertation journey. Dr. Zipp, Dr. DeLuca and Dr. Cupertino, I could not have gotten to the end without your guidance and wisdom throughout the process. To all at Hackensack University Medical Center who supported this research in large and small ways, thank you for believing in this effort.

I also want to thank my PI Assistant, Francisco Cartujano, for all of the help along the way, to Diana Bermudez for your expertise, and to the survey guides, Yamilet Torres, Evelyn Arana and Dora Ponce, for guiding our participants.

To the fifteen participants, thank you for your dedication to telling your story. This study could not have come together without each of you. / A los quince participantes, muchas gracias por su dedicación y por contarnos sus historias. Este estudio no se hubiera podido lograr sin cada uno de ustedes.

Last but not least, an unending thank you to my family, for your prayers and for all of your support. The four years of this PhD journey has been a time I will always remember.

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ABSTRACT

KNOWLEDGE, ATTITUDES, BEHAVIORS AND ENVIRONMENTAL HEALTH NEEDS OF LATINAS IN CLEANING OCCUPATIONS

Erin Speiser Ihde

Seton Hall University, 2020

Dissertation Chair: Genevieve Pinto Zipp, PT, EdD, FNAP

Background: Population health, including research and educational outreach, are quickly becoming mainstays at large tertiary care medical centers around the U.S. In fulfilling this mission, it is essential to understand underserved and underrepresented communities, including any unique health challenges faced.

In New Jersey, the Latino population ranks seventh largest in the country with 1,730,000 Hispanics, or 19 percent of the population throughout the state. Yet there may be underrepresentation in health research and a lack of understanding of key health needs faced by this population. This underrepresentation is impacted by several factors, including lack of health insurance and poverty. In the United States, 90.1 percent of 1,512,000 maids and housekeeping cleaners are female, and of those 49.3 percent are Latino or Hispanic. Therefore, an estimated 671, 619 Latina women work as maids or housekeepers nationally.

Purpose: The purpose of this study is twofold: first to explore the knowledge, attitudes, and behaviors (cleaning routines and product uses) of a bicultural population of Latina women from different countries of origin and acculturation levels. The second is to understand the environmental health needs (such as increased training, use of personal protective equipment,

health services, etc.) within a bicultural population of Latina women from different countries of origin and acculturation levels.

Methods: This was a cross-sectional, general qualitative study that was exploratory in nature. The study consisted of three focus groups with a survey. The focus groups explored the knowledge, attitudes, and behaviors regarding cleaning practices within a bicultural population of Latina women from different countries of origin and acculturation levels. Demographics and information related to cleaning practices at work and at home was collected via a 43-question survey.

Data Collection and Analysis: Data was collected from three focus groups, for a total enrollment of 15 participants. Participants were recruited from English as a Second Language (ESL) classes offered at a high school in Hackensack, New Jersey. Students in the class were mothers of high school students.

Focus group audio recordings were translated from Spanish to English and transcribed for analysis. The PI employed descriptive and *in vivo* coding, and further coded inductively to explore thematic analysis. Statistical analysis of the survey evaluated means and frequency and percentage for each of the responses. This quantitative data helped further describe study participants and included country of origin, household income, health issues, and cleaning products used. Together with the focus group transcripts, both the quantitative and qualitative data helped to form a comprehensive picture of the knowledge, attitudes, behaviors, and environmental health needs of the Latinas participating in the study.

Results: The study results, both qualitative (focus group responses) and quantitative (survey responses) are organized by research question (RQ). For RQ1, the qualitative and quantitative data show that training for cleaning typically began at a very young age. Participants

learned how to clean by observation at home. Over half the participants have been cleaning ten years or more. Several participants spoke to a lack of job training.

For RQ2, the qualitative data shows a variety of attitudes towards chemicals in cleaning products including wanting things to “smell nice.” This is a health concern since scented products often contain phthalates and other chemicals linked to cancer and endocrine disruption. Many participants felt it is important to use products that will get the job done effectively.

For RQ3, the qualitative and quantitative data show that participants have organized work groups where tasks are rotated and/or shared. Most participants are the primary person cleaning at home, suggesting increased exposure to cleaning chemicals. Gloves and masks were the most frequently used PPE, but use is not consistent, and barriers exist.

For RQ4, the qualitative and quantitative data show that the environmental health needs of this population are complex and varied. Respiratory and dermal issues were reported, as well as other concerns such as sore muscles and back problems. Cancer was discussed by participants several times. The roles of genetics, food, and chemical exposures in cancer etiology were of great interest and a variety of opinions on the topic were discussed.

For RQ5, the qualitative and quantitative data show a range of behaviors regarding product use. For participants who purchase their own products, price is a driving factor while others use products per the employer.

Conclusions: Latinas in cleaning occupations in northern NJ face a range of social and health barriers including lack of training, inadequate PPE, low literacy and health issues ranging from short term (skin rashes) to long-term (cancer). The barriers found in this population are compounded by daily environmental exposures from occupational and home cleaning practices.

To address these issues, the development of an intervention is warranted to provide training and resources for this critical population of essential workers.

Key Words: environmental health, occupational exposures, cleaning, Latina, Latino, cancer, endocrine disruption, population health, environmental justice, health disparities

Chapter I

INTRODUCTION

Background

Latinas in Occupational Cleaning: A Population Health Perspective

Population health, including research and educational outreach, are quickly becoming mainstays at large tertiary care medical centers around the U.S. (Begun & Potthoff, 2017).

Caring for the “population” means understanding local health needs and challenges in a way that diverges from one-size-fits-all medicine. In fulfilling this mission, it is essential to understand underserved and underrepresented communities, including any unique health challenges faced.

In New Jersey, the Latino population ranks seventh largest in the country with 1,730,000 Hispanics, or 19 percent of the population throughout the state (Pew Research Center, 2019). Yet there may be underrepresentation in health research and a lack of understanding of key health needs faced by this population. This underrepresentation is impacted by several factors, including that among NJ Hispanics, only 24 percent have health insurance, and 29 percent of those age 17 and younger live in poverty (Pew Research Center, 2019). Several other barriers may also contribute to these issues, including discrimination, segregation, immigration status, acculturation stressors, language barriers, need to work multiple jobs, and lack of access to resources in the community and beyond.

The data also supports that women may be disproportionately affected. In the United States, 90.1 percent of 1,512,000 maids and housekeeping cleaners are female, and of those 49.3 percent are Latino or Hispanic (U.S. Department of Labor, 2017). Therefore, an estimated 671,619 Latina women work as maids or housekeepers nationally. The Bureau of Labor Statistics also categorizes the total workforce of maids and housekeeping cleaners as 16.1% Black or African American, 4.5% Asian and 74.1% White (U.S. Department of Labor, 2017). Overall,

cleaning as a service occupation comprises 3% of the working population in the United States (Medina-Ramon, Zock, Kogevinas et al., 2003). Therefore, the occupation typically involves women, many of whom are immigrants and employed informally, within private homes, as well as in restaurants, hotels, and other locations (Zock, 2005).

Maids and housekeeping cleaners refer to those who “Perform any combination of light cleaning duties to maintain private households or commercial establishments, such as hotels and hospitals, in a clean and orderly manner. Duties may include making beds, replenishing linens, cleaning rooms and halls, and vacuuming” (U.S. Department of Labor, Occupational employment & wages, 2017).

While prior survey-based research has shown that Spanish-speaking Hispanics in NJ are particularly concerned about environmental issues (Burger 2006), there seems to be a lack of any published survey addressing occupational and environmental health concerns among Latina cleaning professionals in any U.S. state. This is a growing public health concern, as there are nearly 54 million Latinos in the U.S, comprising 17.8% of the estimated population (U.S Census Bureau, 2018). This is expected to reach 27.5% of the U.S. population by the year 2060, which is an increase of 93.2% from 2016 to 2060 (U.S. Census Bureau, 2018). While the current Latino population appears relatively young and healthy, the combination of population growth, environmental exposures, aging, and other factors is expected to contribute to declining health in coming decades. In particular, incidence of invasive cancers among U.S. Latinos is projected to increase 142% by 2030 (Smith, 2009). Therefore, studying the population health of occupational cleaning professionals means engaging an understudied population which faces multiple social barriers and health challenges (Hondagneu-Sotelo, 1994; Hsieh, Apostolopoulos, & Sönmez, 2016; Zock, 2005).

Statement of the Problem

It is currently not well understood how within the Latina cleaning community, the purchase and use of cleaning products, product ingredients, job training, and other work practices may contribute to adverse health outcomes, including cancer. It is also not well understood how exposures from cleaning at home may intersect with occupational exposures, nor how low literacy, language barriers, poverty, acculturation, and other factors may influence health outcomes. To date, the author was unable to identify any published research exploring the knowledge, attitudes, and behaviors regarding cleaning practices within a bicultural population of Latina women from different countries of origin and acculturation levels. Therefore, it is important to understand what this population knows, perceives and does in order to assess any health needs and then introduce possible interventions.

Purpose Statement

The purpose of this study is to explore the Latina cleaning community's perspective of environmental health. More specifically, the purpose is twofold: First to explore the knowledge, attitudes, and behaviors (cleaning routines and product uses) of a bicultural population of Latina women from different countries of origin and acculturation levels. The second part of the purpose is to understand the environmental health needs (such as increased training, use of personal protective equipment, health services, etc.) within a bicultural population of Latina women from different countries of origin and acculturation levels.

Research Questions

Based on the stated purpose, the research questions are as follows: For a bicultural population of Latina women from different countries of origin and acculturation levels who work in cleaning occupations in NJ:

RQ1: What is the *knowledge* base specific to cleaning procedures (via *training experiences*)?

RQ2: What are the *attitudes* regarding the presence of chemicals in cleaning products?

RQ3: What are the *cleaning routines (behaviors)*?

RQ4: What are the environmental *health needs*?

RQ 5: What are the *cleaning products used (behaviors)*?

Research Hypothesis

The primary hypothesis is that Latina women use a combination of cleaning products from their home countries and the United States, and they may not receive adequate training in health and safety issues for their occupation. Cleaning products may also not be selected for safer ingredients and may contain chemicals linked to cancer and endocrine disruption, increasing job-related health risks.

Theoretical Framework

In exploring ways to research these issues and address the known gaps in the literature, there are several theories which may be useful. According to the National Institutes of Health (NIH), “A theory presents a systematic way of understanding events, behaviors and/or situations” and is a “...set of interrelated concepts, definitions, and propositions that explains or predicts events or situations by specifying relations among variables” (Glanz, 2019, p. 4). In

research and particularly qualitative studies, theories may be used to both anchor and unite various aspects of the research, providing a foundation for methods development data collection and interpretation of results.

One of the most used and broad health behavior theories is social cognitive theory (SCT), which attributes human behavior to the continual interaction of personal factors, environmental influences, and personal behavior (Bandura, 2002; Glanz, 2019). Therefore, SCT "...explores the reciprocal interactions of people and their environments, and the psychosocial determinants of health behavior" (Rimer, 2005, p. 19). This theory includes six constructs: reciprocal determinism, behavioral capability, expectations, self-efficacy, observational learning (modeling) and reinforcements (Rimer, 2005).

For this proposed study, social cognitive theory supports the findings in the literature review, and has been used in planning the study, particularly the focus group guide. Past research has found that cleaning products often contain ingredients that may lead to adverse health effects, in addition to other work hazards among custodians, and cleaning staff working in hotels and private homes (Hsieh, 2016; Hsieh, 2017; Medina-Ramón, 2006; OSHA, 2012; Soni-Sinha, 2013; Svanes, 2018). These populations with occupational exposures exemplify reciprocal determinism, which is an interaction between an individual, his or her environment, and behavior.

The concept of behavioral capability speaks to "knowledge and skill to perform a given behavior," (Rimer, 2005, p. 20). Those in cleaning occupations use knowledge and skill to perform their jobs and make decisions daily that ultimately may lead to positive or negative health outcomes. The concept of expectations, or expected results from a behavior, was explored in the focus groups of the study carried out through this dissertation, titled, "Knowledge,

Attitudes, Behaviors, and Environmental Health Needs of Latinas in Cleaning Occupations" (EHLCO). Through the focus group guide, prompts have been included to ask participants what expectations they may have relating to their cleaning routines both at home and work, and whether their expected outcomes have been realized, pertaining to their health. For example, are there any unexpected health conditions experienced by Latina women? These responses will help to create a comprehensive, dynamic picture of the environmental health needs of the participants.

The focus groups also explored the concept of self-efficacy, which is “confidence in one’s ability to take action and overcome barriers” (Rimer, 2005, p. 20). Bandura describes this quality as self-regulation, when people “...adopt personal standards, and monitor and regulate their actions by self-reactive influence” (Bandura, 2005, p. 10). Therefore, the focus group guide includes questions related to, What barriers do you face during your cleaning routines? What solutions are currently in place or may help in the future? Connecting to participants’ understanding of barriers and potential solutions will help inform a possible intervention in future research.

Observational learning (modeling) is integral to Latinas in the cleaning occupations, as literature suggests that informal training occurs by workers observing each other and sharing tips to help ensure optimal outcomes (Hondagneu-Sotelo, 1994). Reinforcements occur when other women in the informal network further support shared information by mirroring each other’s advice and passing it along in a continuous cycle within the group or network (Hondagneu-Sotelo, 1994). Bandura addresses this in a cultural context: “Many of the things [people] seek are achievable only through socially interdependent effort. Hence, they must pool their knowledge, skills, and resources, provide mutual support, form alliances, and work together to secure what they cannot accomplish on their own” (Bandura, 2002, p. 270).

Therefore, the focus group guide asked participants about their work behaviors, including who they clean with, what routines they have, decision making processes, and even what products are used. This information contributed to forming a comprehensive picture of the environmental health of Latinas in the cleaning occupations, so that a future intervention may be created to address health disparities and needs.

Another theory that could have been used is the Health Belief Model (HBM), which "addresses the individual's perceptions of the threat posed by a health problem (susceptibility, severity), the benefits of avoiding the threat, and factors influencing the decision to act (barriers, cues to action, and self-efficacy)" (Glanz, 2005, p. 12). Created in the 1950s and expanded upon over time, the theory includes six constructs that influence whether people act upon information to prevent or control their health issues. These are a person's belief about their susceptibility for a condition, severity of the illness, benefits, and costs of taking action, exposure to opportunities for action, and belief of self-efficacy or success (Glanz, 2005).

The HBM could have been applied to the EHLCO study in designing the focus group questions and evaluating the results. For example, participants could have been asked whether or not they believe there are health consequences from using traditional cleaning products, how severe they believe the problem is, and whether or not they have considered changing their cleaning products or practices and their thoughts on costs and benefits of this. Participants could also have been asked if they have been presented with any opportunities to change practices or products, and whether they believe this effort would be successful if attempted. Thus, the Health Belief Model encompasses a rich basis for exploring this issue, which may aide in uncovering key motivations and barriers for action and change among Latinas in the cleaning occupations.

With both theories considered, choosing the right theory for the proposed study was key.

The National Cancer Institute's guide, *Theory at a Glance: A guide for health promotion practice states*, "One of the greatest challenges for those concerned with behavior change is learning to analyze how well a theory or model 'fits' a particular issue" (Glanz, 2005, p. 6). The guide offers a succinct table summarizing the eight most relevant theories to help researchers decipher which most relates to an area of investigation (Glanz, 2005, Table 11, p. 45). While the HBM relates on the individual level, the SCT addresses the interpersonal level. Therefore, it supports the exploration of how "personal factors, environmental factors, and human behavior exert influence on each other" while the HBM focuses on "individuals' perceptions of the threat posed by a health problem, the benefits of avoiding the threat, and factors influencing the decision to act" (Glanz, 2005, Table 11, p. 45). Therefore, the EHLCO study focuses on the interpersonal level, which lies between individual-level theories concerning people's behavior and community-level theories most applicable to practitioners interested in changing the environment. The SCT addresses the interpersonal level, which "lie[s] in-between, exploring the reciprocal exchanges between individuals and their environments" (Glanz, 2005, p. 44). Thus, for the EHLCO study, the SCT was an essential lens to use in exploring environmental influences on Latinas' work practices, including health and safety on the job and in cleaning at home, as well as influences of family, co-workers, culture and the community. Clearly, before questions related to the HBM could be asked, it was first necessary to find out, for Latinas in cleaning occupations in northern New Jersey, what the occupational practices were, and if there were adverse health outcomes experienced by this group as this information was not previously known. Therefore, the Social Cognitive Theory was more applicable to the research questions under consideration.

Chapter II

LITERATURE REVIEW

Environmental Health Risks of Cleaning Occupations

The nature of this occupation often results in "low social and legal protection...without proper contracts or insurance" which makes professional cleaners "likely to escape from control such as regulations, health surveillance, and risk prevention" (Zock, 2003, p. 581). Viewing these factors through the lens of environmental health may provide an opportunity for further exploration to fully understand barriers and challenges, and potential interventions to overcome these issues. According to the Centers for Disease Control and Prevention (CDC), the field of environmental health is focused on "protecting groups of people from everyday threats to their health and safety that result from elements in their environments" (2013). The CDC defines environment broadly, encompassing three elements: physical needs such as clean air and water, the need for safe communities, and the need for personal satisfaction (relationships, fulfillment, etc.) (CDC, 2013).

A relatively new area of environmental health is the concept of the interconnectedness of multiple exposures, and how chemicals may affect human health in isolation and in combination (NIH/National Toxicology Program, 2019). Health effects from such exposures may be short-term and highly treatable, such as asthma, or more long-term such as a slow-growing cancer that develops over a long latency period.

There is a small but impactful body of research on cancer and mortality among workers in the cleaning industry. A 2019 study analyzed breast cancer risk for 2,190,246 Ontario workers in the Occupational Disease Surveillance System from 1983-2016 and found increased risk for

both men and women working in janitorial/cleaning services (Sritharan et al., 2019). This may be due to chemical exposures, but this association has not been previously examined, so more research is warranted (Sritharan et al., 2019).

Van den Borre and Deboosere analyzed Belgian census data on mortality among men and women ages 30-60 from 1991-2011 and found that occupational cleaners suffered increased death versus non-manual workers. This was specifically due to respiratory and cardiovascular causes: COPD, lung cancer, pneumonia, ischemic heart diseases, and cerebrovascular diseases (2018).

A U.S. study examining increased rates of thyroid cancer analyzed data on Connecticut residents from 2010-2011. This case-control study of 462 confirmed cases and 498 controls found an increased risk of papillary thyroid cancer with a tumor size greater than 1cm for janitors and cleaners, among other occupations (Ba et al., 2016).

Another study, examining increased rates of renal cell carcinoma, found “suggestive elevated associations” among several occupations, including janitorial/cleaning workers (Karami et al., 2012, p. 344). This study of African American and Caucasians living in the Detroit and Chicago metropolitan areas found the strongest associations among agricultural and dry-cleaning workers, which may suggest a common link of occupational exposure to chemical mixtures (Karami et al., 2012).

Adverse health effects from chemical exposures can occur from everyday contact with a variety of products in the home and workplace. For those who clean professionally, the nature of this work requires repeated, persistent handling of a variety of cleaning products and chemicals, which may or may not be chosen by those who use them daily. As cleaning professionals may

have language and education barriers, they may not have sufficient knowledge of the health effects of these chemicals, nor ways to mitigate exposures and report those which occur.

Another barrier may be a perception among consumers that American laws require safety testing for cleaning products, and those for home and institutional use are reasonably safe when successfully brought to market. However, to date, there are no laws requiring safety testing for these products, which often contain a diverse mixture of ingredients, by any U.S. federal agency (U.S. Consumer Product Safety Commission, 2018). Surprisingly, of approximately 80,000 chemicals used in commerce in the U.S., only a few hundred have been tested for safety (The Presidents Cancer Panel, 2009). Thus, this leads to questions of a possible interconnectedness between lack of testing and the limited knowledge of health effects of these products, particularly among those who use them occupationally.

The President's Cancer Panel 2008-09 annual report details a vast range of potential environmental carcinogens, many of which are understudied and under regulated in the U.S. (The Presidents Cancer Panel, 2009). Barriers to understanding these include "meaningful measurement and assessment of the cancer risk associated with many environmental exposures" due to "lack of accurate measurement tools and methodologies" (The Presidents Cancer Panel, 2009, pp. vii). The science behind environmental exposures is an evolving field, and research findings warrant precaution. Specifically, the literature on exposures to mixtures of chemicals, such as those in cleaning products, is scarce. As the science continues to expand, those with work exposures to a range of chemicals deserve adequate occupational health information now, including training and safety measures.

It was once thought that "the dose makes the poison" as written by Paracelsus in the 14th century (Grandjean, 2016). However, modern toxicology considers a constellation of factors.

The timing of exposure, the exposure site or mode of transmission, the developmental stage of a person and more, combine to affect severity and health outcomes. For example, when looking at cleaning products, the number of cleaning products used, in addition to quantity of each product, duration, location and frequency of use, combine to influence possible health effects. These products commonly contain ingredients known to cause health effects, and when used in combination or mixtures, may give rise to still other health issues (Gerster, Vernez, Wild & Hopf, 2014). In a Swiss study analyzing the 105 most frequently used products among 1476 cleaning companies, up to 75% of professional cleaning products were found to contain irritant ingredients and 64% had ingredients considered harmful (most commonly to eyes, skin and by ingestion), according to European Union labeling guidelines. These ingredients include “fragrances, glycol ethers, surfactants, solvents, and to a lesser extent, phosphates, salts, detergents, pH-stabilizers, acids, and bases” (Gerster et al., 2014, p. 46). As these chemicals are also found in other commonly used products, exposures may come from a variety of sources. Each source may be understood alone and in combination with other everyday sources. Currently, based on the limited data available, cleaning product exposures are not well-understood (Gerster et al., 2014), especially from the perspective of those who use them. A gap in the literature exists in identifying specific barriers for high-use groups such as Latinas who clean occupationally. Once the knowledge, attitudes, behaviors, and environmental health needs are identified, effective interventions may be created to address these.

Occupational Health and Worker Rights

Occupational health movements nationally have exemplified how exposure issues must be acknowledged and examined before formal organizing or safety measures can be enacted (Nir,

2015). In 2005, community health workers from Asian Health Services (AHS) were conducting diabetes education in Oakland, CA and noticed the high number of female nail salon workers experiencing an "epidemic of health issues, such as asthma, chronic rashes, and miscarriages" (CA Healthy Nail Salon Collaborative, 2019). The AHS organized the California Healthy Nail Salon Collaborative to make "the nail salon industry healthier, sustainable and just" for the 129,000, mostly Vietnamese immigrant women in the state (CA Healthy Nail Salon Collaborative, 2019). Their efforts broke the silence and led to an organized workers movement created in a linguistically and culturally relevant manner to engage and optimize outcomes for those affected. The movement, which spread to New York City, and is now being organized nationally, serves as an example for salons around the globe to improve working conditions for the women whose livelihoods depend on this service industry (CA Healthy Nail Salon Collaborative, 2019; Nir, 2015).

Before the nail salon workers movement was organized, women often ignored their adverse health outcomes, which ranged from persistent coughing to nose bleeds and even high rates of cancer. As a mostly minority and immigrant population of women, nail salon workers handle a range of chemicals in close range daily, often without adequate training or personal protective equipment. As the *New York Times* article series on nail salon workers quoted one woman, "There are thousands of women who are working in this, but no one asking: 'What's happening to you? How do you feel?' We just work and work" (Nir, 2015). This viewpoint was addressed in a study from the UCLA Labor Center titled, "Nail Files: A study of nail salon workers and industry in the United States" which documents experiences of women working in the industry and provides recommendations for improved health and safety (UCLA, 2018).

The President's Cancer Panel 2008-09 annual report states that "exposure to potential

environmental carcinogens is widespread” (The Presidents Cancer Panel, 2009). In particular, human-made chemicals called xenoestrogens, or estrogen mimickers, which exist in some cleaning and personal care products, interfere with the endocrine system and “cause various health defects by interfering with the synthesis, metabolism, binding or cellular responses of natural estrogens” (Roy, Chakraborty S., Chakraborty T.R., 2009). Therefore, they affect the human body by interfering with estrogen binding to estrogen receptors. This process can affect the timing of puberty, and play a role in estrogen-dependent cancers such as breast cancer (Roy et al., 2009; Kabat et al., 2006; Colón, Caro, Bourdony, & Rosario, 2000; Fernandez & Russo, 2010; Crinnion, 2010). Specifically, chemicals called phthalates and triclosan have been associated with endocrine disruption and hormonally derived cancers (Wolf et al., 2010; Li, Ying, Zhao, Chen, Lai, & Su, 2013; Henry & Fair, 2011; Dinwiddie, Terry & Chen, 2014). Parabens, which are a common preservative in a range of products, are also estrogen mimickers (Gee, Charles, Taylor, & Darbre, 2008; Boberg, Taxvig, Christiansen, & Hass, 2010).

Occupational and Environmental Health Barriers for Latinas

As noted earlier, in the United States, 90.1 percent of 1,512,000 maids and housekeeping cleaners are female, and of those 49.3 percent are Latino or Hispanic (U.S. Department of Labor, 2017). Considering the presence of Latino females (Latinas) in the cleaning industry, they may have higher occupational exposures to cleaning products than other racial and ethnic groups. Additional factors which may increase Latinas’ unsafe exposure to cleaning products include low literacy, language barriers, poverty, acculturation, and other factors. It is currently not well understood how within the Latina cleaning community, the purchase and use of cleaning products, product ingredients, job training, and other work practices may contribute to occupational exposures with adverse health outcomes. Understanding how cleaning products are

purchased, used, and handled may help decrease negative occupational exposures and promote better health outcomes.

Job hazards in the cleaning industry include exposures to toxic chemicals which can result in adverse health effects including allergies, dermatologic and respiratory issues, as well as infections from biologic exposures (Hsieh, 2016; OSHA, 2012). Longer-term effects include cancer as noted earlier. Despite awareness among some cleaning personnel that toxic products are being used, knowledge may be limited by lack of job training, unavailability of safety materials in native languages, and lack of personal protective equipment such as masks and gloves (Hsieh, 2016; Hsieh, 2017). Health and safety issues are compounded by lack of overtime pay, and lower pay specifically for women whose cleaning work is considered by some employers as “light duty” compared to typically male cleaning work such as buffing and waxing floors (Soni-Sinha 2013). Despite the term “light” duty, the work involved to clean bathrooms, stairs, kitchens and other high-traffic areas repeatedly throughout the day and over time may make the term “light” seem inaccurate. Additionally, the lower pay for females may be a financial barrier to accessing adequate health care. It further compounds the issue as many Latinas in the cleaning occupations may be self-employed and therefore purchase their personal protective equipment (PPE) and with limited resources, may choose not to use them. Proper use of PPE may lead to better health outcomes among this population.

According to analysis of OSHA data for unionized workers at five of the largest hotel chains in the U.S., Hispanic housekeepers had a particularly high injury rate of 10.6%, with female housekeepers being three times more likely to be injured than men (Buchanan et al., 2009). While race/ethnicity alone was not found to be a marker of increased risk, the intense physical demands of housekeeping, which has a high concentration of women, was a factor

(Buchanan et al., 2009).

Under-reporting of injuries is also another barrier to healthy working conditions in both the unionized hotel industry (Buchanan et al., 2009), and non-unionized and/or informal cleaning jobs. Latina hotel housekeepers are particularly at risk for injury due to physical and psychosocial issues, including time pressures, low wages, job insecurity, workplace maltreatment, immigration status, language barriers and acculturation level (Hsieh, 2016).

Chemical exposures compound these other occupational hazards. A 22-site study analyzing data from the European Community Respiratory Health Survey found that chemical exposures from cleaning at home and at work have adverse health effects even 10 to 20 years later, specifically accelerated lung function decline in females. Moreover, the effect size was comparable to that of 10 to 20 pack-years of tobacco smoking (Svanes, 2018). Women were particularly susceptible, as the use of cleaning products at least once per week was associated with accelerated lung function decline “compared with not performing cleaning activities” while among men, exposure to cleaning products was not significantly associated with decline in lung function (Svanes, 2018). While it is not clear why women were shown to be affected and not men, the small number of men included in the study compared to women may have contributed to these figures (Svanes, 2018). Other reasons could be that women have other unique exposures that many men do not. For example, women may be using a greater number of personal care products than men, which may contribute to symptoms. Another study, this one in the U.S., explored short-term effects among 43 female domestic cleaners with asthma and/or chronic bronchitis. The study found increased respiratory complications on working days and days with greater hours spent cleaning, particularly from the use of diluted bleach, degreasing sprays and air fresheners (Medina-Ramón et al., 2006).

Some of the most widely publicized, limited exposure research among Latinas focuses on Mexican American teens in Northern California, who participated in the HERMOSA intervention study (Harley et al., 2016). One hundred females aged 14 to 18 years were surveyed regarding cosmetic and personal care product use and supplied a urine sample for analysis. The bio samples were tested for three phthalates, four parabens and two phenols. At pre-intervention, over 90% of the urine samples had “detectible concentrations of MEP, MnBP, MiBP, methyl paraben, propyl paraben, triclosan or BP-3” (Harley et al., 2016, p. 1603). After three days of using personal care products without these chemicals, “metabolite levels decreased in 68%, 58%, and 55% of girls for MEP, MnBP, and MiBP, respectively...” (Harley et al., 2016, p. 1603). These findings were compared with self-reported personal care product use on participant surveys, which showed that teens with higher use had higher levels of urinary metabolites of several chemicals, including phthalates, parabens, triclosan and BP-3 (Berger, 2018). As this study shows, two goals of exposure science are to not only find biological exposures that may exist, but to bring awareness and most importantly, change behavior so that they can be decreased or eliminated.

Another exposure study concerning the pervasive chemical bisphenol-A (BPA), and its "cousin" chemicals in pregnant women in New Jersey (NJ) also tested urine, though not specifically in Latinas. It found that 90% had detectible levels of one or more BP chemical (Ihde et al., 2017). BPA and similar substitute chemicals, called BP analogs (“cousin chemicals”) are endocrine disruptors. Among these pregnant women, 77% of their newborns’ cord blood tested positive for one or more BP analog (Ihde et al., 2017).

Another biomonitoring study with urine, this one also located in New Jersey, found bisphenol-A (BPA), phthalates, parabens and 4-nonylphenol (4NP) in a cohort of 50 children

ages four through eight. All 50 children had detectible levels of at least one chemical in each of the chemical categories of BPA, phthalates, and parabens. This was the first known study measuring 4NP in U.S. children, and 28% tested positive (Ihde, Loh & Rosen, 2015). Such exposures are compounded by "background" exposures from the environment, including surface water and groundwater, air and soil, as one Centers for Disease Control and Prevention-funded study explored in northern New Jersey, the location of the study currently proposed (Ihde et al., 2014). The study mapped eight contaminants as listed on the NJ Department of Environmental Protection's Known Contaminated Sites list from 2005-2007, which resulted in 269,790 mapped points of detection (Ihde et al., 2014). The breadth of contamination in the environment, in addition to exposures from products and everyday practices on the job or at home, combines to create a "chemical soup" of exposures that is cause for concern. By identifying and eliminating exposures when possible, health outcomes may be improved.

Existing Research Tools

In considering what research tool to use to best answer these questions, the author looked at several existing models. The first is the model used in the UCLA Nail Files study, which used a qualitative study design to conduct individual interviews. These were reported as case studies from individual workers, which were included in the Nail Files report to highlight personal testimonies of work practices and areas of opportunity for these workers (UCLA, 2018).

Therefore, the report serves as an overview for the industry and is designed to be used to enact policy change and empower workers. This study was done in collaboration with the CA Healthy Nail Salon Collaborative. Prior to the issuing of this report, the AHS community workers had already conducted preliminary work to identify and publicize key health and justice issues.

For the study proposed herein, in the tradition of the occupational and environmental health and justice movement in California for nail salon workers, similar interviews are warranted for Latina cleaning professionals working in New Jersey. A more in-depth examination is needed to explore and identify existing issues before a larger study may be feasible. While the AHS work was first designed to be diabetes education, the PI's study focused from the beginning on environmental health and safety issues among Latina women who clean occupationally. Though the Nail Files report conveys key information to address occupational and environmental health needs, a study on Latina women who clean occupationally warrants novel research tools to address the specific needs and challenges of this population. This need was fulfilled in the form of a targeted focus group guide and brief survey.

Another research tool which can be used as a guide in the current study is one developed by a team from New York University, addressing the occupational health needs of Mexican immigrants. The study team developed a tool in collaboration with the National Institute for Occupational Science and Health (NIOSH) (Gany, Dobslaw, et al, 2011). The team surveyed Mexican immigrants utilizing the Mexican Consulate Services in New York City over a two-week recruitment period, resulting in 185 survey respondents (Gany, 2011). They found that 18% of this group suffered job-related injury and 29% had not reported it (Gany, 2011). Within the group, 18% worked in the cleaning occupations, and almost all were female. Additionally, while 18% had experienced pain or illness, 82% did not report it, and those experiencing this were more likely to be female. Additionally, 18% of these pain or illness complaints "were related to irritation due to chemical exposure (eye irritation, cough, allergies)" (Gany, 2011, p. 176).

While this tool was uniquely designed to address the needs of the Mexican immigrant population, it is not the right tool for understanding the environmental health of the Latina cleaning community. The intended audience for this tool was men and women from a variety of occupations including construction, restaurant work, retail, factory work and other jobs. The current study with Latinas will explore those working only in the cleaning occupations and will take a "deeper dive" into the specific practices and health needs of this population.

As a result of the Mexican immigrant study, the research team found that, "culturally and linguistically responsive community outreach programs are needed to provide education on occupational health and safety information and resources for urban Mexican workers" (Gany, 2011, p. 178). With this insight, the study being proposed herein will be conducted with an awareness of the possible need to create a future intervention to address any health needs that arise as a result of the focus groups and survey.

Summary

In summary, Latinas who clean occupationally face numerous barriers on the job including physical strain and injuries, respiratory and dermal issues from cleaning product exposures, low wages, poverty, and lack of health insurance. As an occupation, long-term exposure issues are not well understood, though it is known that chemicals are absorbed (Berger et al, 2019; Gerster et al, 2014). Low pay and lack of overtime pay are barriers within the occupation (Hsieh et al, 2016; Soni-Sinha et al, 2013), as are discrimination and gender inequities (Soni-Sinha et al, 2013). There is a lack of personal protective equipment (Hsieh et al, 2016). Other barriers include language, literacy, training (Hsieh et al, 2016). Health issues

including respiratory problems are comparable to 10-20 pack years of smoking (Svanes et al, 2018).

Additionally, lack of standardized training and education on personal protective equipment such as gloves and masks suggest an opportunity to further explore how best to provide health and safety education to this population in a culturally and linguistically effective manner.

After conducting a thorough literature review, the PI was unable to identify any published research exploring the knowledge, attitudes, and behaviors regarding cleaning practices within a bicultural population of Latina women from different countries of origin and acculturation levels. Therefore, the PI designed a convergent mixed-methods study involving focus groups to explore open-ended questions followed by a survey, to gain greater insight into Latina women who work in cleaning occupations. This was an exploratory study to understand participants' knowledge, attitudes and behaviors pertaining to working in the cleaning industry and use of cleaning products. The focus groups discussed cleaning practices, health issues and concerns, product use and purchase, as well as use of personal protective equipment (PPE) such as masks and gloves. Once a fuller understanding of occupational exposures and barriers of Latinas working in cleaning professions is secured, an intervention strategy may be employed to improve the health and working conditions among those in this growing occupation.

Chapter III

METHODOLOGY

Aim of the Study

The purpose of this study is twofold. The first is to explore the knowledge, attitudes, and behaviors (cleaning routines and product uses) of a bicultural population of Latina women from different countries of origin and acculturation levels. The second is to understand the environmental health needs (such as increased training, use of personal protective equipment, health services, etc.) within a bicultural population of Latina women from different countries of origin and acculturation levels.

As previously stated, these aims were used to answer the following research questions:

RQ1: What is the knowledge base specific to cleaning procedures (via *training experiences*) of a bicultural population of Latina women from different countries of origin and acculturation levels?

RQ2: What are the *attitudes* regarding the presence of chemicals in cleaning products of a bicultural population of Latina women from different countries of origin and acculturation levels?

RQ3: What are the *cleaning routines* of a bicultural population of Latina women from different countries of origin and acculturation levels?

RQ4: What are the environmental health *needs* of a bicultural population of Latina women from different countries of origin and acculturation levels?

RQ 5: What are the *cleaning products used* by a bicultural population of Latina women from different countries of origin and acculturation levels?

Research Approach: Convergent Mixed Methods Design

For the most effective health care, evidence from both the qualitative and quantitative approaches should be integrated (Polgar & Thomas, 2007). Therefore, both methods are needed to effectively address health problems. Quantitative approaches provide opportunity to view patients objectively. Qualitative approaches allow for exploring patients' perspectives and insights into their subjective experience; often within context of social circumstances (Polgar & Thomas, 2007).

This was a cross-sectional study that was exploratory in nature (Creswell, 2013). The study consisted of a focus groups with a survey. The focus groups explored the knowledge, attitudes, and behaviors regarding cleaning practices within a bicultural population of Latina women from different countries of origin and acculturation levels. The qualitative focus groups were designed using semi-structured, open-ended guided questions and probes. Philosophical assumptions were folded into the interpretive framework and theory that framed the theoretical lens of the study (Creswell, 2013). This study was general qualitative, as it did not fit into the five approaches discussed by Creswell (2013). The quantitative component was a closed-ended survey (Creswell, 2013). Demographics and information related to cleaning practices at work and home was collected via a 43-question survey.

Overview of Participant Recruitment

Participants were recruited from English as a Second Language (ESL) classes offered at Hackensack High School in Hackensack, located at First & Beech Streets, Hackensack, NJ 07601. Students in the class were mothers of the high school students. The protocol stated that study recruitment flyers would be distributed to individuals who attend English as a second

language (ESL) classes at Hackensack High School by the class instructor at the end of every class session. ESL classes meet two days per week during the academic school year. Interested participants who work in cleaning occupations and meet the study inclusion criteria as identified on the flyer would be invited to call the PI or PI Assistant (PIA) if their preferred language is Spanish, to learn more about participation in the focus groups.

The protocol also stated that if the ESL classes were not in session at the time of recruitment, the Hackensack High School Parent Outreach Coordinator (POC) asked class members for permission to be contacted by the PI or PIA by phone. The POC then provided an approved phone list to the PI and PIA, to contact potential participants and read the recruitment flyer over the phone. Therefore, the PI received permission from the Parent Outreach Coordinator at Hackensack High School, to use the class list to contact students (Appendix H).

As the first focus group started in the summer when ESL classes were not in session, the PI and PIA used the supplied phone list. The PI and PIA called those initials on the list and read the study flyer over the phone. As this method proved effective for the first focus group, the PI continued this practice for the remainder of the focus groups and documented this practice in a note to file in the study regulatory log for inclusion in the study's annual continuing review, per the policy of the HMH IRB. An amendment was also approved by the IRB allowing participants to provide the PI and PIA with contact info for a friend or family member who also cleaned occupationally, for possible recruitment.

The PI had access to this population through the bilingual PI Assistant (PIA) and a member of the PI's dissertation committee who were volunteer instructors for the English as a Second Language (ESL) classes at Hackensack High School. The school is located approximately one

block from Hackensack University Medical Center. The Parent Outreach Coordinator at Hackensack High School provided a letter of permission (Appendix G).

Sample

The study was designed for recruitment of up to 40 adult Latinas from different countries of origin, allowing for up to five focus groups of up to 10 participants each. The sample size was defined as until saturation was reached. This study was cross-sectional, as each focus group met only once. It utilized non-probability, purposive sampling (mothers taking ESL classes in the community).

When determining sample size for qualitative research, Creswell advises to not only study a few individuals, but to include enough to collect extensive detail, and to conduct enough observations until the items under study are clear and saturation is reached (Creswell, 2013).

This study recruited Latina women age 18+ years old who work in a cleaning occupation, speak Spanish or English, and were willing to give written informed consent. Excluded were those who were not Latina, unable to provide informed consent, who did not speak Spanish or English, who did not work in a cleaning occupation, and who were under age 18. To be eligible, participants had to be willing to participate in a 90-minute focus group discussion, which included completing a paper and pencil survey, to explore their knowledge, attitudes and behaviors specific to cleaning product use and perceptions on health needs. The inclusion and exclusion criteria were incorporated into the eligibility checklists, available in Appendix M1 (English version) and M2 (Spanish version).

The PI had no supervisory and/or professional relationship with the subjects. The bilingual PIA and dissertation committee member were volunteer instructors for the ESL classes. They

were not paid or otherwise compensated for their time. Additionally, the adult learners in the class were there voluntarily and did not receive grades for participation.

Data Collection

Potential participants were recruited using a class list and the recruitment flyer . Potential participants self-identified their interest to participant. The PI and PIA confirmed via phone their ability to meet the study inclusion criteria and if appropriate extend an invitation to a focus group. The recruitment flyer was worded at a 4th grade level according to the Flesch-Kincaid scale (Garbers, Schmitt, Rappa & Chiasson, 2010).

The research was conducted at HackensackUMC, and the meeting space was determined based upon availability at the hospital during the scheduled meeting time. The focus groups took place in a closed room with enough chairs for all participants. HackensackUMC is the PI's place of employment and thus had access to room scheduling. This study was approved by the centralized IRB for Hackensack Meridian Health (HMH) and by Seton Hall University's pre-IRB.

It must be noted that no deception was used in this research study. The study PI, Erin Ihde, MA, CCRP and the PI Assistant (Francisco Cartujano, MD, certified in bilingual translation) were familiar with the protocol and Hackensack University Medical Center IRB policies. The PI and PI Assistant completed the IRB-required education in the protection of human research subjects.

Study Procedures

Overview. Three focus groups with a total of fifteen participants were conducted in order to gain insights that would enable the PI to address the study purposes. Domains from the Social Cognitive Theory informed the development of the focus group guide and survey. The Focus Group guide questions were aligned with the research questions and constructs of the social cognitive theory, as shown in the chart in Appendix N. The Focus Group Guide began with an ice breaker: “What does it mean to be Latino?” and “What do you think of the use of cell phones to get health information?” Part 1 of the guide is Cleaning at Home (12 questions) and Part 2 is Cleaning at Work (12 questions). General topics covered included cleaning routines, purchasing behaviors and access/usability of cleaning products, and environmental health needs. Examples for focus group questions included:

- Tell me about the cleaning routine at your home in a regular week. Who does what / when?
- Tell me about a time you may have experienced health concerns related to using cleaning products at home.
- Tell me about the cleaning routine at work in a regular week. Who does what / when?
- Tell me about a time you may have experienced health concerns related to using cleaning products at work.

Additionally, as shown in the Study Procedures Chart (Appendix P), probing questions were used to elicit more detail during discussions and to clarify responses (Dixon, Singleton & Straits, 2016). Examples of probing questions included “Can you tell me more about that?” and “What do you mean by that?”

Translation Method

The study translation method followed the U.S. Census Bureau's *committee approach* (consensus method) for translating data collection instruments and supporting materials (Pan & De la Puente, 2005). For the focus group guide, survey, recruitment flyer and eligibility checklist, two qualified translators conducted a translation of the documents independently while a third qualified translator (from Engagement Education Corp.) compared the two documents and arrived at the final document (see Appendix J). This third translator also translated all the write-in responses on the surveys, from Spanish to English for analysis. All focus group transcripts were translated by a language service serving hospital systems and government agencies and provided letters of accuracy for each transcript (see Appendix L). The consent form was translated by HackensackUMC's translation service, which provided a letter of accuracy, as per guidelines for all patient signed forms (see Appendix K). Further details on the method used for English to Spanish translation for the focus group guide, survey, recruitment flyer and eligibility checklist are available in Appendix I.

Focus Group Procedures. Once participants arrived at the focus group session, they read and had read to them the consent form and any participant questions were addressed by the PI and PIA. All participants provided written consent. Each focus group session could take place in either in English or Spanish, according to the preferences of the participant as stated at the time that eligibility was confirmed. Focus groups 1, 2 and 3 all took place in Spanish. Each focus group had one moderator and one note-taker. The PIA, who is bilingual and a certified translator, served as the focus group moderator for the Spanish-language groups while the PI serves as note-taker. The study was designed so that the PI would serve as the moderator for English-language

groups, and the PIA would serve as the note taker. Each focus group discussion lasted up to 45 minutes, followed by a written paper and pencil survey which took approximately 15 - 20 minutes to complete for a total of up to 90 minutes, including the consent process. Focus groups were conducted at a variety of days and times, though all in the evening, to meet the needs of the participants' schedules. The PI recorded all focus groups using the PIs personal digital voice recorder and as a backup method, an iPad or iPhone.

After each focus group discussion, participants were asked to complete a survey exploring sociodemographic information (age, gender, education level, acculturation level, country of origin, etc.) and responses to questions related to cleaning practices and the use of cleaning products. The survey took approximately 20 minutes. Paper surveys were available in Spanish and English at the focus groups along with writing tools. The participants were asked to complete the survey in the focus group room but independently without any discussion amongst participants. The responses were later entered into a data capture and management tool called **Research Electronic Data Capture (REDCap)**, hosted by Hackensack University Medical Center in a password-protected account accessible only by the investigator team. REDCap is a nonprofit project of Vanderbilt University, in part funded by NIH, and used by researchers in 130 countries (Harris et al., 2009).

All participants received a \$25 gift card for their time and were provided light refreshments at the focus group. The focus groups were conducted at Hackensack University Medical Center in Hackensack, New Jersey.

Amendments during pilot phase. Focus groups #1 and #2 comprised the pilot phase of the study. During the pilot phase, two amendments were submitted and approved by the IRB.

Amendment 1 stated that if an ESL class student would like to bring a friend or family member – who also works in a cleaning occupation - to the focus group, she must provide the PI or PIA with the friend or family member’s phone number and preferred language. The PI or PIA then called the potential participant and read the recruitment flyer over the phone to determine interest in study participation. If the friend or family member was interested, the PI or PIA determined if the person met all study inclusion criteria. Therefore, the same eligibility criteria and process was followed for all potential participants. There were therefore no changes to the recruitment flyer and no changes to the consent form needed for this Amendment.

This amendment also allowed the PI to provide a fact sheet for participants on safer cleaning, after the focus group and survey were complete. This educational flyer was published by government agencies (CDC, NIOSH and OSHA) and available in Spanish and English (Appendices Q1 and Q2). Both language versions were printed and available at the focus groups. This info sheet was optional for participants to take home.

In FG #1 (pilot data), literacy issues and unfamiliarity with survey participation was a barrier to correctly and adequately filling out the survey. With IRB approval of Amendment 2, three bilingual survey guides were added, starting with FG #2 to provide one-on-one assistance with reading and filling out the survey. Only survey data from FG #2 and #3 are presented in the study results.

Three additional survey assistants were added to the study staff section of the IRB application, were all from Latin American countries and spoke Spanish as their first language. The "survey assistants" did not provide translation, as the survey was already translated for the participants.

Ethical considerations. The study was conducted according to the International Conference on Harmonization (ICH), Good Clinical Practice (GCP), the Declaration of Helsinki, Institutional Review Boards (IRB) and in accordance with the U.S. Code of Federal Regulations on Protection of Human Rights (21 CFR 50).

Confidentiality. Information regarding participants was limited to name and phone number and were available to the research staff. The risk related to breach of confidentiality was limited. These two identifiers (name and cell phone number) collected on the eligibility form, were not linked to the participant's focus group responses/transcript and survey responses.

Focus group audio recordings were stored on a password-protected computer system at HackensackUMC and only accessible by the research staff. The study was designed so that no identifiable information would be mentioned during the focus groups. Once transcriptions are finalized, audios will be permanently deleted. Individual speakers on the transcripts were not linked to their identifiable information and were not identified by name or participant number. Three levels of security were used to prevent unauthorized persons from accessing this data: password protection on all data files with identifiable information, a locked cabinet, and a locked office. The purpose of this monitoring plan is to ensure the safety, privacy, and confidentiality of study participants and the validity of data in compliance with the National Institutes of Health (NIH) requirement of Data and Safety Monitoring. Although the highest caliber of data protection and storage was implemented for all data collected, there is a small risk that others not involved in the study could gain access to this data, although the PI will continue to take measures to reduce this possibility. Publications or presentations resulting from this research will not contain any information that could potentially identify participants, either directly or

indirectly.

Informed consent. Written consent was obtained from each participant prior to entering the study. Each participant was provided with information and explanations of the aims, methods, anticipated benefits, and potential risks of the study. The PI assistant (PIA) facilitated this process by reading aloud the consent form in Spanish and answering any participant questions. The participant was informed that they may withdraw from the study at any time without prejudice and compilation of that person's data would cease as of the date of his/her written request for withdrawal. The consent form is readable at a fourth-grade level.

Data Analysis

Transcriptions. The focus group sessions were audio recorded using two methods: an Olympus digital voice recorder, and as a secondary, backup method an iPad or iPhone was utilized. The audio recording from the digital voice recorder was downloaded after each session and sent for translation. As all three focus group sessions took place in Spanish, a certified bilingual translator transcribed and translated the sessions verbatim into English for analysis. A certificate of language accuracy is available in Appendix L for each focus group. Translations were completed after the pilot phase and again after Focus Group #3. Each was reviewed by the PI to determine if saturation had been reached.

Coding. The PI read and re-read the translated transcripts several times to form a general understanding of the text. This is the first step in the process of qualitative data analysis (QDA) as described by Seidel (1998). He asserts that the simple foundation of QDA is noticing,

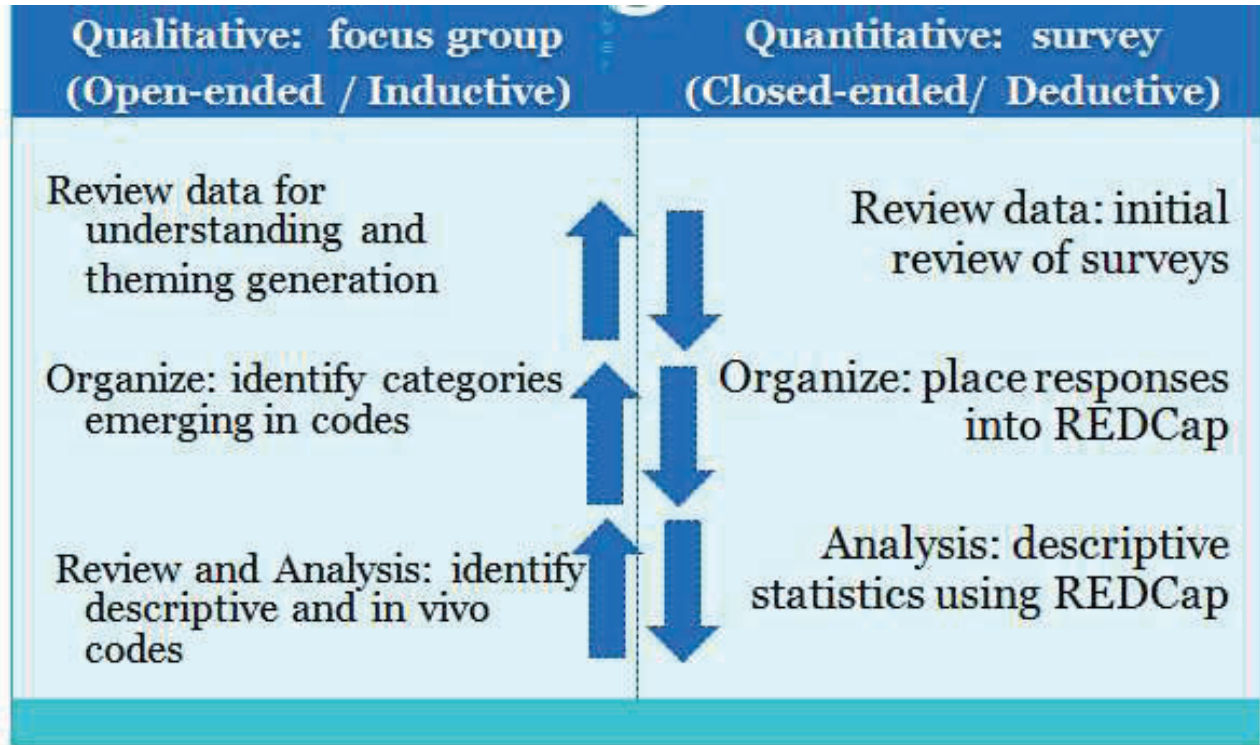
collecting and thinking about the data before moving forward with more intricate and complex analyses (Seidel,1998). Creswell describes this as the “reading and memoing stage” when he recommends identifying “major organizing ideas” or categories across all databases (Creswell, 2013, p. 184). The PI used Saldana's color-coding method to organize the text: “Researchers with smaller data sets needing just three to ten major codes and/or categories total can assign a specific colored font to text passages that belong in the same category.” (Saldana, 2016, p. 29)

PI assigned emergent codes & sub-codes using *in vivo* and descriptive coding (Creswell, 2013; Saldana, 2016). The PI used Saldana’s two-part coding process of decoding to determine the core meaning of a passage and encoding to determine which code to use and label the passage (Saldana, 2016). Codes were reviewed by faculty researcher for accuracy and met intercoder agreement of 80-90% recommended by Saldana (Saldana, 2016).

A summary of the data analysis procedures can be seen in Figure 1.

Figure 1

Convergent Mixed Methods Data Analysis Procedures



Statistical Considerations. Statistical analysis of the survey will evaluate means and frequency and percentage for each of the responses. This quantitative data helped further describe study participants and included country of origin, household income, health issues experienced, and cleaning products commonly used. Together with the focus group transcripts, both the quantitative and qualitative data complemented each other and helped to form a comprehensive picture of the knowledge, attitudes, behaviors, and environmental health needs of the Latinas participating in the study.

Responses were entered into a data capture and management tool called **Research Electronic Data Capture (REDCap)**. This is a free, nonprofit project of Vanderbilt University, in

part funded by NIH, and used by researchers in 130 countries (Harris et al., 2009), accessed at www.project-redcap.org. Survey responses were analyzed using descriptive statistics (e.g. counts, frequencies, mean, median, mode) generated by REDCap.

Thematic Analysis. Themes were determined inductively by reviewing the results of coding the data, to determine the main topics, or themes recurring in the translated transcripts from the three focus group sessions. Themes were used to further analyze and synthesize the data to form conclusions about the knowledge, attitudes, behaviors, and environmental health needs of the participants.

Interpretation. The coding process and resulting codes, sub-codes, categories, and thematic analysis were used to interpret the data and represent it in tables, as well as inform the discussion and conclusions (Creswell, 2013). This process included using the codes, sub-codes, categories and thematic analysis to answer the five research questions. Additionally, the social cognitive theory (SCT) was used as a framework for further interpretation and forming conclusions about the data.

Validity and Credibility: Focus Group Guide and Survey. Validity of the focus group (FG) guide and survey was achieved through review by three faculty members from the PI's dissertation committee. In this process, a Rater Form was used to evaluate each question on the FG guide and survey according to the criteria of clarity and appropriateness. Majority consensus for each question was required. Therefore, the lowest level of Delphi process was used to ensure all questions met these criteria.

An audit trail was established in that focus groups were recorded and transcribed verbatim (Creswell, 2013). Additionally, Spanish/English translation certified for accuracy. Codes agreed upon by faculty reviewer for accuracy, ensuring intercoder agreement (Saldana, 2016). Thick rich descriptions are presented in results to judge transferability (Creswell, 2013).

Reliability of Focus Group Guide and Survey. Reliability of the two study tools were assessed during the pilot phase (Creswell, 2013) consisting of the first two focus groups with survey. Additionally, the PI compared pilot phase findings to the literature review. Overarching consistencies were identified.

To help ensure cultural and linguistic relevance, all survey questions were reviewed for cultural appropriateness by the PIA, one survey assistant and a dissertation committee member, Dr. Cupertino. All are from Latin American countries (Brazil, Mexico, and Ecuador).

Chapter IV

RESULTS

Introduction

The study results, both qualitative (focus group responses) and quantitative (survey responses) are organized by research question.

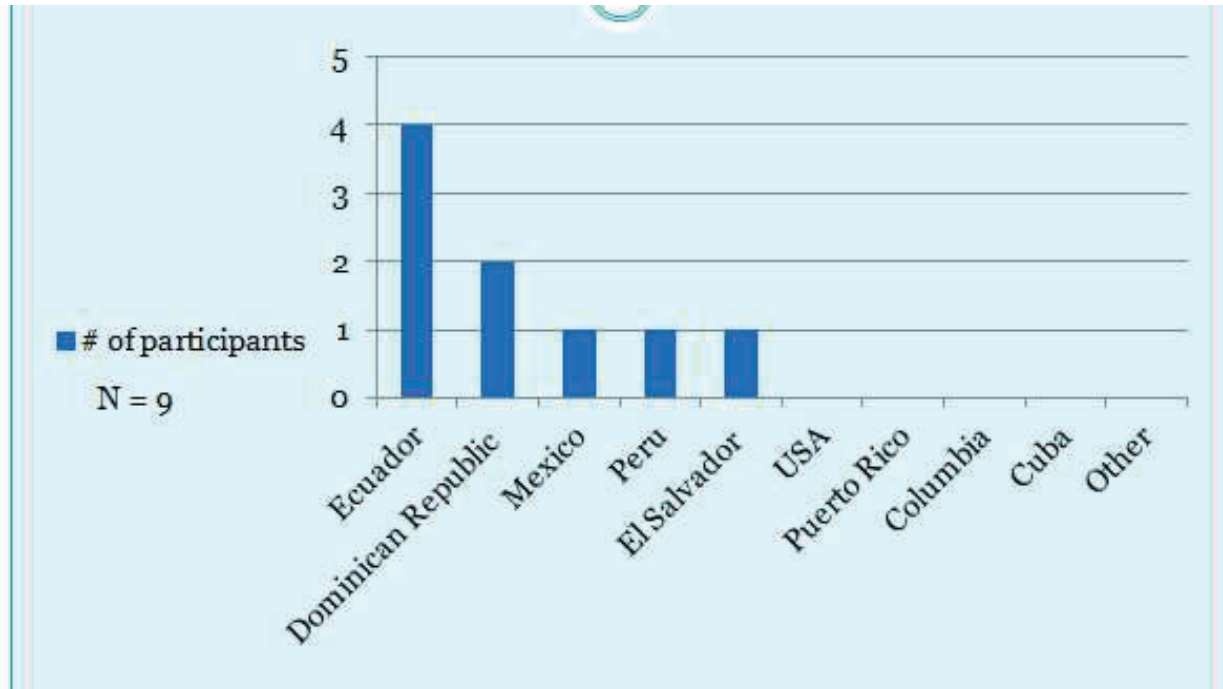
Before reporting the results by research question, an overview of participant characteristics is provided in the form of social/demographic information. The first section of the participant survey was comprised of 16 social/demographic questions. The other three survey sections were Health Information, Cleaning Routine at Work and Cleaning Routine at Home.

Social/Demographic Characteristics of Participants

Participants' country of origin included five countries. The greatest frequency were Ecuador (4 participants, 44.4%) and the Dominican Republic (2 participants, 22.2%). Mexico, Peru and El Salvador were the home countries for one participant, or 11.1%, each).

Figure 2

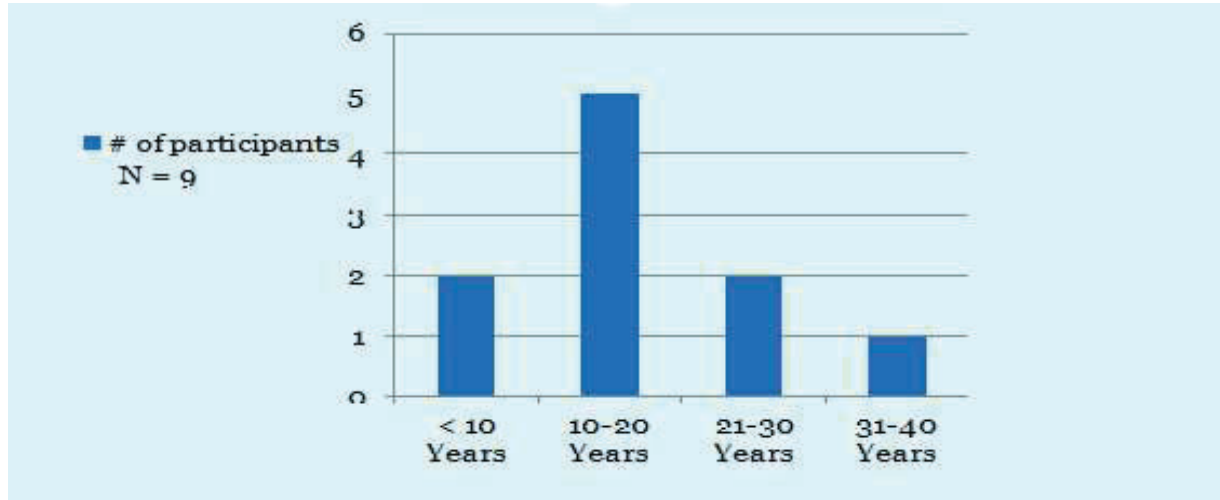
Country of Origin



The number of years that participants have lived in the U.S. varied from under 10 to up to 40. The most frequent answer was 10-20 years (5 participants, 55.6%), as seen in Figure 3. The median was 17.0 years and the mean was 18.78 with a standard deviation of 7.85 years.

Figure 3

Years Living in the U.S.

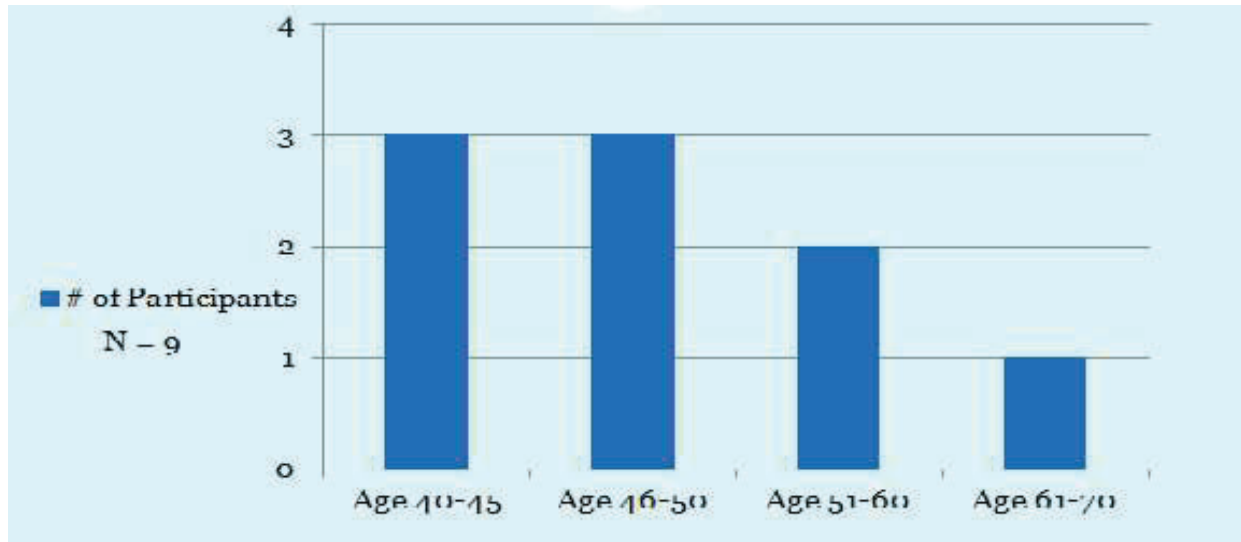


All nine survey respondents (100%) were first generation, meaning that they immigrated to the U.S. themselves. Other response choices were second, third and fourth generation. Second generation indicates being a son or daughter of an immigrant, and third generation indicates being a grandchild of an immigrant.

Participants ranged in age from 41-61, with the most frequent responses in the 40-45 and 46-50 categories (6 responses, 66.7%). The median age was 46.0, with a mean of 48.78 and standard deviation of 6.72.

Figure 4

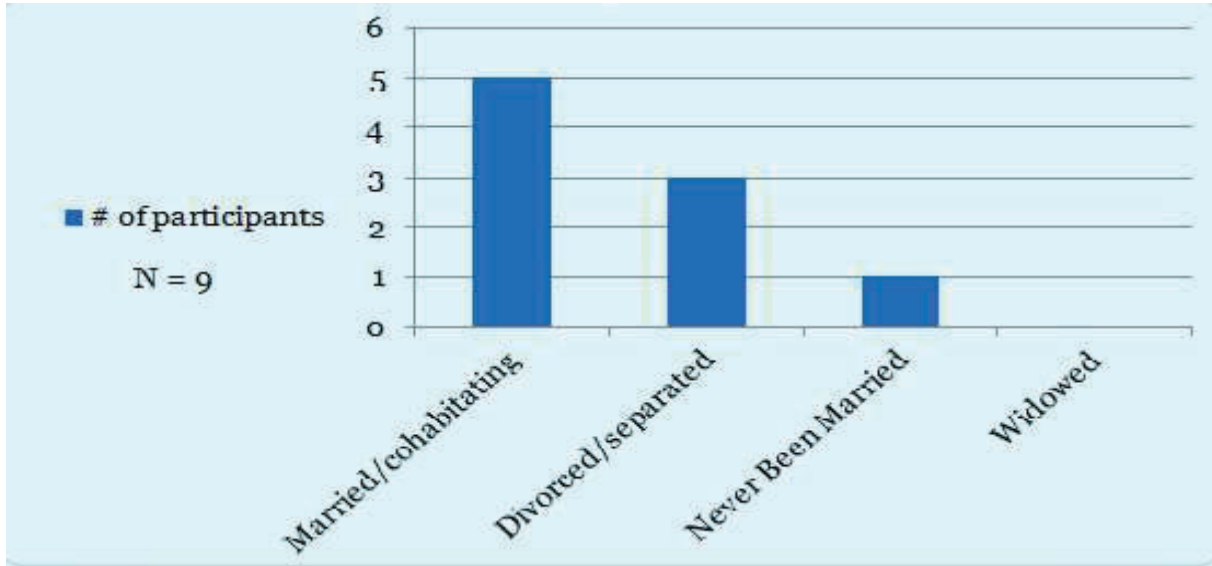
Age of Participants



Marital status included five (55.6%) participants who were married or cohabitating, three (33.3%) who are divorced/separated and one (11.1%) who had never been married.

Figure 5

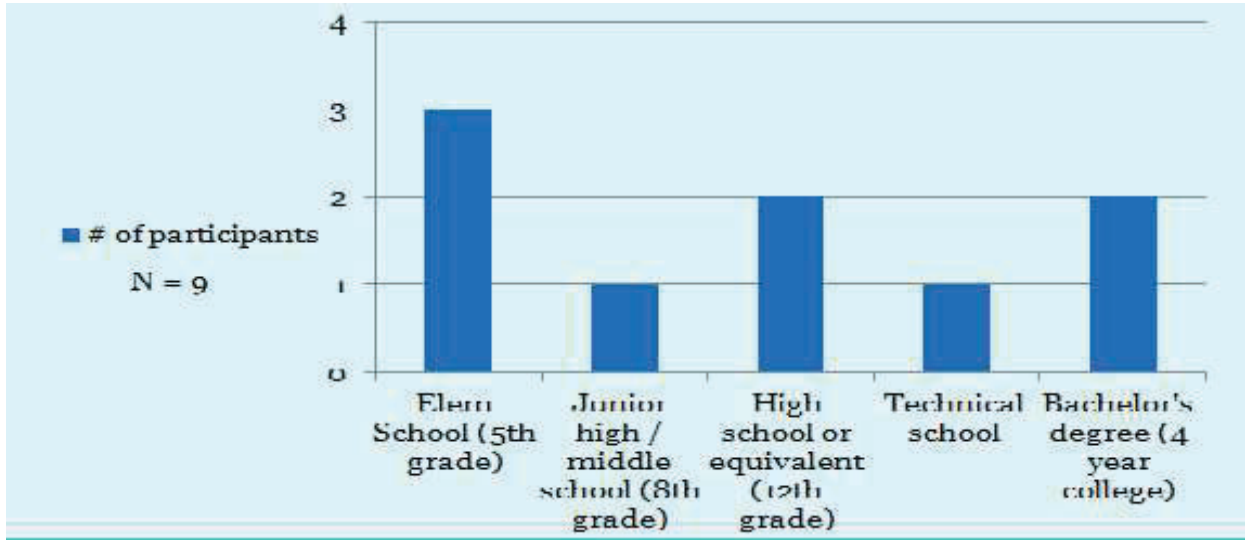
Marital Status



When asked "What is your highest level of education completed?" three (33.3%) indicated elementary school (5th grade), one (11.1%) junior high/middle school (8th grade), two (22.2%) high school or equivalent (12th grade), one (11.1%) technical school, and two (22.2%) bachelor's degree (4 year college).

Figure 6

Level of Education

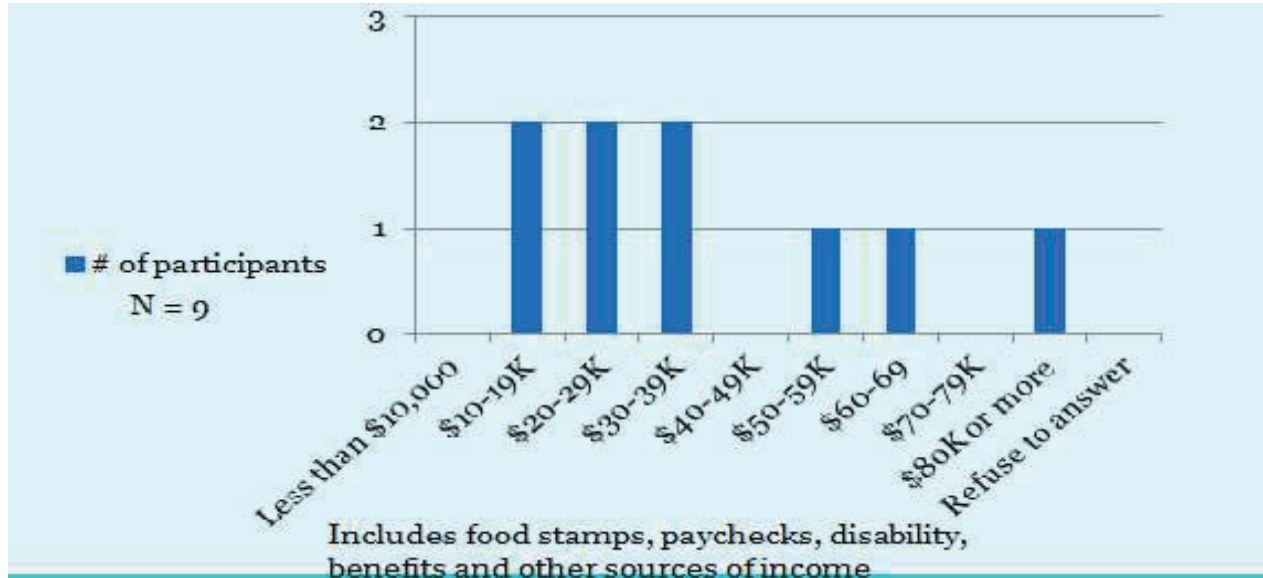


When asked "What is your race?" seven participants (77.8%) responded Other, while two (22.2%) responded White. Write-in responses under "Other" were Mestizo (2 respondents), Hispanic (2) and Latina (3).

When asked "What is the total income (before taxes) for all the people who live in your home?" most participants (6 respondents, or 66.7%) reported in the \$10,000-39,000 range.

Figure 7

Total Combined Pre-Tax Income at Home



Lastly, the Social/Demographic section asked participants about their preferred language in a variety of communication scenarios. These six questions were included in order to determine the most appropriate language for designing a future intervention for this population. The response choices for each were: only Spanish, more Spanish than English, both equally, more English than Spanish, and only English.

For the question "What language(s) do you read and speak?" three (33.3%) participants stated only Spanish, while six (66.7%) indicated more Spanish than English. For the question "What language(s) do you speak at home?" four (44.4%) stated only Spanish, four (44.4%) stated more Spanish than English, and one (11.1%) indicated speaking both languages equally. When asked "In what language do you think?" seven (77.8%) stated only Spanish while two (22.2%) indicated more Spanish than English. When asked "What language do you speak with your friends?" six participants indicated speaking only Spanish (66.7%), two (22.2%) indicated more Spanish than English, and one (11.1%) indicated more English than Spanish. For the

question "What language do you use for text messages?" seven participants (77.8%) stated only Spanish, one (11.1%) indicated more Spanish than English, and one (11.1%) indicated using both languages equally. Lastly, when asked "What language do you use on social media (Facebook, Instagram, etc.)?" eight participants responded only Spanish and one wrote in "N/A" (not applicable), suggesting not being active on social media.

The remainder of the study results are presented according to the corresponding research questions. Therefore, the quantitative and qualitative data are organized by RQ as appropriate.

Research Question 1: What is the knowledge base specific to cleaning procedures (via *training experiences*)?

Qualitative Data for RQ1

Table 1 below shows the codes and subcodes for focus groups 1, 2 and 3, with key words and phrases in bold. The predominant codes are: Started cleaning young, Tradition, Learned by observation. The category is: Experience Drives Knowledge, and the thematic analysis is: Knowledge gained through training experiences starts young by tradition and is typically learned through observation.

Table 1

Knowledge base (training experiences): codes and subcodes for focus groups 1-3

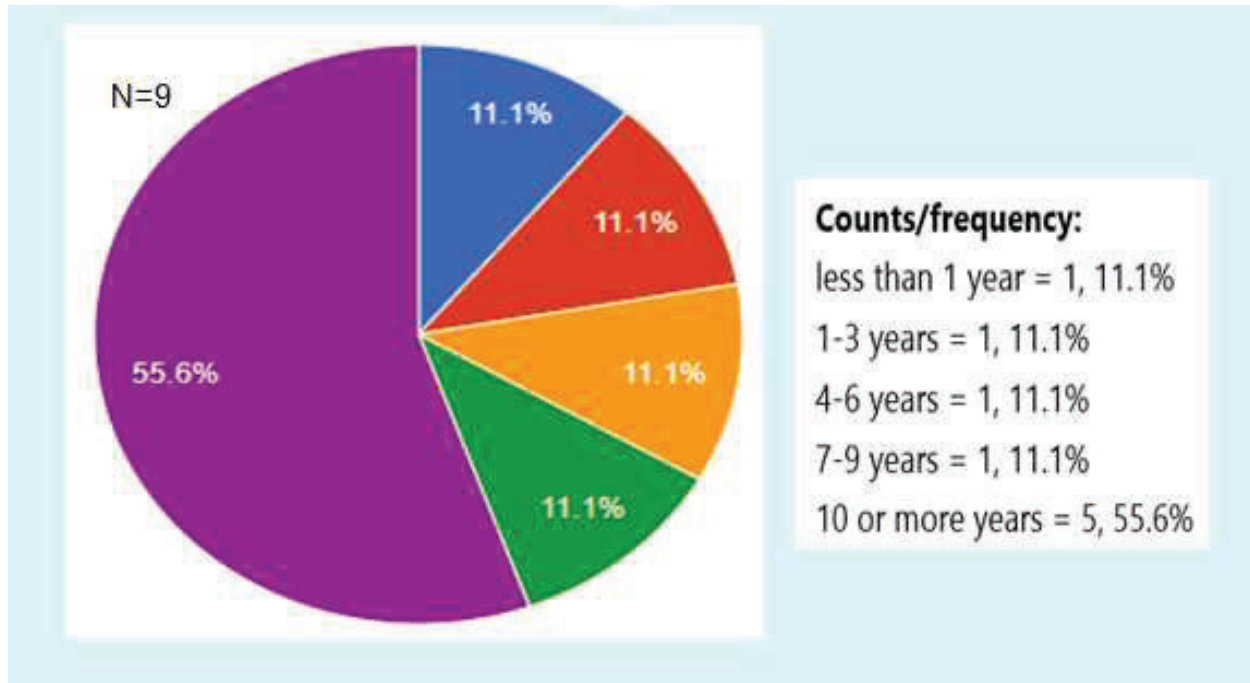
Focus Group 1	Focus Group 2	Focus Group 3
<p>C: taught to clean "since I was a girl"</p> <p>C: taught to clean "by tradition" (3x)</p> <p>C: "at three years old"</p> <p>C: "at thirteen"</p> <p>C: "grandfather would say, mop the hallway"</p> <p>C: "clean the walls on Saturdays"</p> <p>C: "she never taught me, I would watch them"</p> <p>C: "we Latinos learn to do things...witho taught"</p> <p>C: out of need</p>	<p>C: "started very young"</p> <p>C: had to clean from a young age...the house</p> <p>C: helped neighbors clean</p> <p>C: "where there was a woman giving birth...you went...to help her with the cleaning"</p> <p>C: cleaning since age five</p> <p>C: started cleaning "around seven years old"</p> <p>C: no choice from parents</p> <p>SC: clean the dishes, mop the floor...from a young age</p> <p>C: "also started from a young age"</p> <p>C: taught by mom</p> <p>C: trained to clean thoroughly at home, even walls</p> <p>C: Mom had her help clean church (2x)</p> <p>C: "mainly at my house the men never mopped"</p> <p>C: took cleaning course for training</p> <p>C: agency teaches not to use strong products</p> <p>C: no training provided for cleaning at the school</p> <p>C: "I'm the one to give them training [at work]"</p> <p>SC: "teach them how to take care of themselves, how to protect themselves"</p>	<p>C: "you learn at home but you don't use as many chemicals as at work."</p> <p>C: boss tells what products are good</p> <p>C: trains co-workers to put down towels to protect their knees</p> <p>SC: puts down carpets or paper before kneeling (2x)</p> <p>C: not given any job training (2x)</p> <p>C: "20 years ago when I started...some type of health person would come...they taught us how to take off the gloves..."</p> <p>SC: "I liked that because...someone was concerned about us, who was interested in us."</p> <p>C: "the bosses only gave a paper when we started...and it says "training" such and such product, and the instructions."</p> <p>SC: told us cloths are thrown away</p> <p>SC: they want mops thrown out..."but they give us one mop"</p> <p>C: paper that the boss read as training was in English and were told "that's what it says, and sign here"</p> <p>C: "years I've worked there, 19 years, but they never gave me training..."</p> <p>C: "it's a good idea to come to our jobs to teach us in trainings"</p> <p>SC: "sometimes we don't know how to use the products, and we mix them, too"</p> <p>SC: "spread the word to many people...at our job there are three of us, but you should go...to the institutions, where there are many of us..."</p> <p>SC: "to raise awareness...that we have to love ourselves a bit more...this is very important...that's what you're here for..."</p>

Quantitative Data for RQ1

Two survey questions comprised the quantitative data for RQ1. When asked "How long have you been in the cleaning profession?" five participants (55.6%) responded ten years or more, suggesting a high level of experience gained on the job.

Figure 8

Years in the Cleaning Profession



When asked "What type of job training would be helpful to learn new skills?" (N=5) three participants (60.0%) preferred "Text messages to phone with tips and links to website resources." One (20.0%) chose "Someone training me at my workplace" and two (40.0%) answered "Someone training me at a community center." For Focus Group 3, the PI conducted a deeper dive by revising the question to "How would you like to receive training about health and safety practices related to your cleaning job?" The PI increased the response options to seven, which were answered according to the following (N=4): Training provided through email = 1 (25.0%), Training provided through text messaging to your phone = 3 (75.0%), Onsite in-person training at workplace = 2 (50.0%), Onsite in-person training at community center = 2 (50.0%). The responses Not sure, Not interested in learning new skills at this time and Other (please

explain) all received zero (0.0%).

RQ 1 Summation

Taken together, the qualitative (focus group) and quantitative (survey) data show that training for cleaning typically began at a very young age. Participants learned how to clean by observation at home. Cleaning the home was expected, as well as helping in the community such as at church. Over half the participants have been cleaning ten years or more, suggesting knowledge gained and shared with others over time. Several participants spoke to lack of training and a desire to have training in person at their job, at a community center, or by a text intervention.

Research Question 2: What are the *attitudes* regarding the presence of chemicals in cleaning products?

Qualitative Data for RQ2

Table 2 below shows the codes and subcodes for focus groups 1, 2 and 3, with key words and phrases in bold. The predominant codes are: Looks & smells good, Word of mouth, Rarely read labels. The category is: Product performance matters and the thematic analysis is: Chemicals aren't typically a consideration; Need to use what's necessary to perform job well.

Table 2

Attitudes regarding cleaning chemicals: codes and subcodes for focus groups 1-3

Focus Group 1 (attitudes)	Focus Group 2 (attitudes)	Focus Group 3 (attitudes)
<p>C: smells nice C: it smells so nice SC: better products; chemical-free, helped me C: "all organic things have chemicals too"</p>	<p>C: prefers less strong C: "use some strong liquids, and it's for the people" C: use bleach to clean nicely C: "Mr. Clean...with lime scent...which doesn't smell so bad" C: there are people who like...that it looks good and smells good C: husband likes it to smell C: "I like the smell, too...both things..." code: "you feel happier...because it's clean and it smells good..." C: doesn't read labels because already knows what to use C: chooses products based on word-of-mouth recommendations C: "we don't look [at labels]" C: looks at ingredients on product label SC: tries to avoid everything SC: "practically try to avoid everything...that's why I use without air, without water...and bleach..."</p>	<p>C: "she did buy us one that is excellent, that is natural" C: when receiving unhealthy product, we'll use our own product C: sometimes buy vinegar, read that it's better than bleach C: read which products are good C: it "has a very strong smell" C: no time to read product labels C: product labels are in English...and they're all miniscule...you've got to use a magnifying glass...</p>

Quantitative Data for RQ2

There were no survey questions corresponding to Research Question 2.

RQ2 Summation

Taken together, the qualitative (focus group) data shows a variety of attitudes towards chemicals in cleaning products. Several people remarked about liking a "floral" smell and wanting things to "smell nice." This is a health concern since scented products often contain phthalates and other chemicals linked to cancer and endocrine (hormone system) disruption (Ihde

et al, 2016). Many participants felt it is important for spaces to “look good and smell good,” and therefore to use what will get the job done effectively.

Research Question 3: What are the *cleaning routines (behaviors)* of a bicultural population of Latina women from different countries of origin and acculturation levels?

Qualitative Data for RQ3

Table 3 below shows the codes and subcodes for focus groups 1, 2 and 3, with key words and phrases in bold. The predominant codes are: Clean daily, Flexibility, Heavy duty.

The category is: Home and work routines and the thematic analysis is: Occupational cleaning involves physically intense work that extends from the job to home.

Table 3

Cleaning routines (behaviors): codes and subcodes for focus groups 1-3

Focus Group 1	Focus Group 2	Focus Group 3
<p><u>Cleaning at Home</u> Code(c): cleans "every day" (4x) Sub-code (SC): "child with kidney disease" C: dust everything, finish with bathrooms C: vacuum daily C: bathroom twice a week C: clean after children C: visitors in the kitchen (2x) C: "kitchen and bathroom are the main thing"</p> <p><u>Cleaning at Work</u> C: 20 houses per month C: clean houses and medical offices SC: six houses per month SC: clean with daughter C: cleaned a building C: cleaned two to three houses, one per week</p>	<p><u>Cleaning at work</u> C: apartments C: cleans and cares for elderly (2x) C: "apartments, houses, offices, and apartments after construction" C: apartments and a house SC: washes dishes...cleans and cooks C: worked at dry cleaner before, ironing clothes, washing shirts C: provides own transportation C: opens window or uses fan for ventilation</p>	<p><u>Cleaning at work</u> C: daily sweeping, mopping, cleaning windows C: bathrooms C: lobby C: elevator doors C: work daily 8-4 C: second job cleaning apartments SC: kitchen is hardest part SC: rotate cleaning bathrooms and kitchen, three women cleaning together SC: second job depends on how many move out C: cleaning houses, arrive at 8am SC: cleans with another person C: offices at University SC: cleaned student rooms SC: bathrooms, small cafeterias, lobbies at university C: some homes require stronger products C: "vinegar and add baking soda" C: "men's work, the women do it" SC: told to clean carpets SC: colleague shampoos carpet SC: "force ourselves to do the work" C: "using heavy machines, the shampoo machine" C: "she does heavy duty work" C: move furniture SC: move cabinets and beds alone C: "cleaned where the students live" C: boss inspects bathrooms C: "got fed up, told him [boss] no"</p>

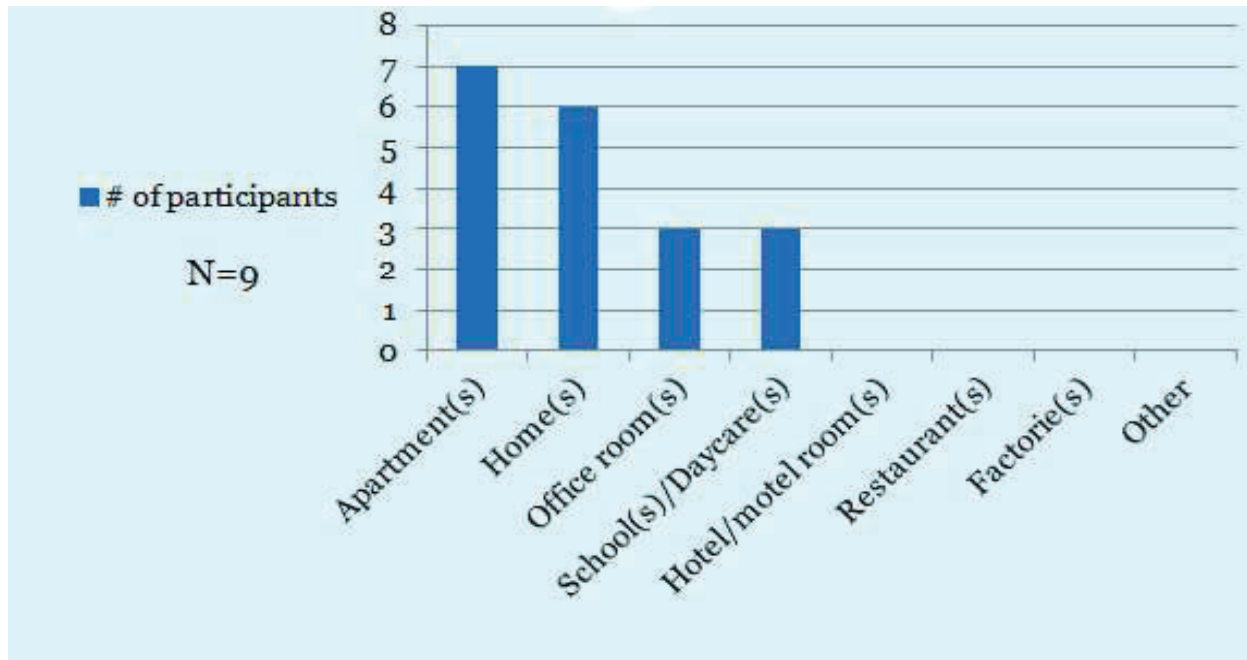
Quantitative Data for RQ3

Sixteen survey questions comprised the quantitative data for RQ3. As seen in Figure 9, when asked "What type of place do you clean?" the most frequent response was apartments (7, 77.8%), followed by homes (6, 66.7%), office room(s) (3, 33.3%) and school(s)/daycare(s) (3, 33.3%). For the seven participants who clean apartments, six (85.7%) clean 1-4 per week and one participant (14.3%) cleans 9-12 per week. For the six participants who clean homes, four (66.7%) clean 1-4 per week and two (33.3%) clean 9-12 per week. Among the three participants

who reported cleaning office rooms, all clean 1-4 per week. For the participants who clean schools/daycares, all three (100.0%) clean 1-4 per week.

Figure 9

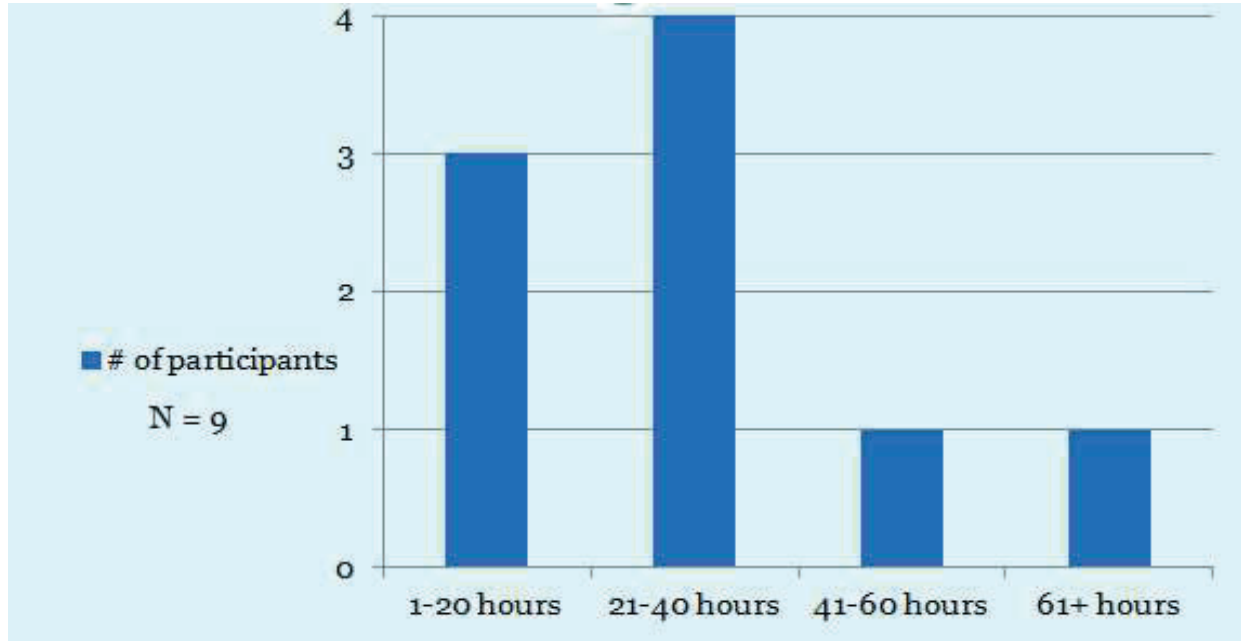
Type of Place Participants Clean



As seen in Figure 10, the most frequent number of hours spent cleaning for work were 1-20 hours (3, 33.3%) and 21-40 hours (4, 44.4%).

Figure 10

Hours/week spent cleaning at work



As Figure 11 shows, all participants conducted a variety of cleaning operations within their occupational role. For each task category, participants were asked to indicate the typical number of hours per week with four response choices of 1-2 hours, 3-4 hours, 5-8 hours, and 9 or more hours.

- **Dusting** was reported by 9 (100.0%) of participants. Six (66.7%) responded 1-2 hours, two (22.2%) indicated 3-4 hours, and one (11.1%) 5-8 hours. Products used were: Just use feather duster / and damp cloth 1/2 water and 1/2 disinfectant; "Pine Wall" (meant "Pinesol"); cloth; Fabuloso; lemon oil with paper towel; water and towel; wet towels and "doesn't know."
- **Mopping** was reported by 8 (88.9%) of participants. Six participants (75.0%) indicated 1-2 hours and two (25.0%) indicated 3-4 hours. Products used were: 1/2 water and

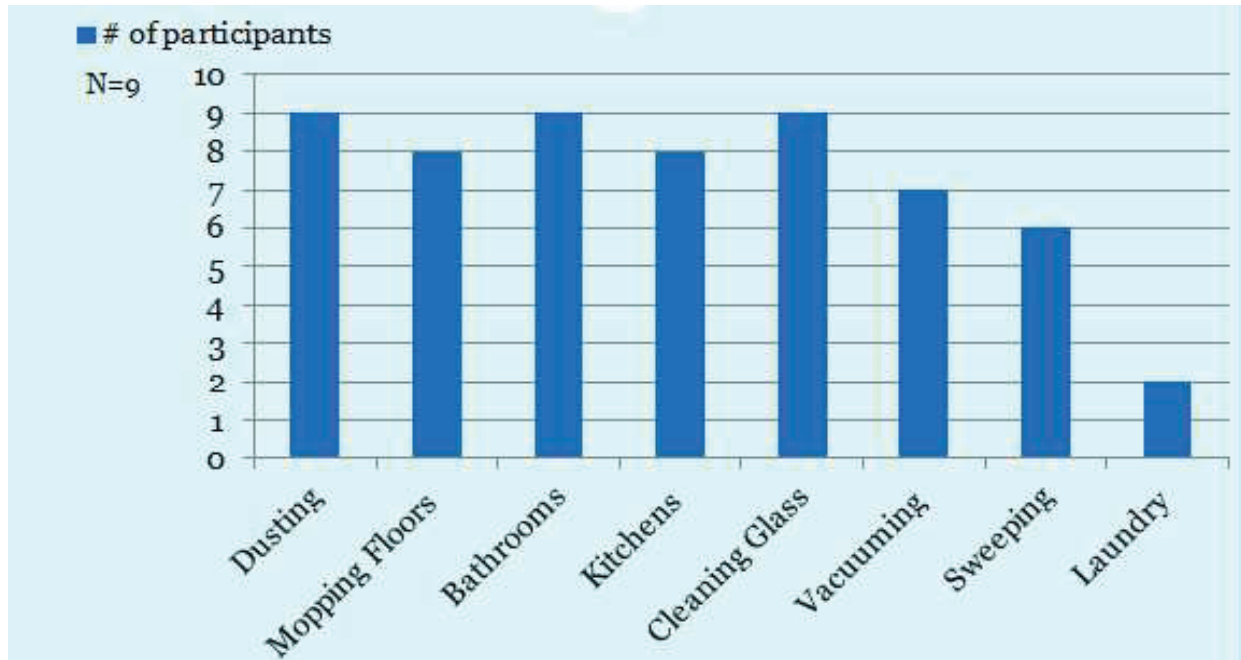
disinfectant / Fabuloso; Bleach, Acid, Jaboven powder; Mistolin; Fabuloso / Clorox; Mr. Clean; Fabuloso; Fabuloso and other products provided by my boss.

- **Cleaning bathrooms** (e.g. bathtub, shower, toilet, sink) was reported by 9 (100.0%) of participants. Six participants (66.7%) indicated 1-2 hours and three (33.3%) indicated 3-4 hours. Products used were: "Cloro" (likely meant Clorox) wipes one deep cleaning per week - using a spray and Ajax for toilet bowl; Clorox (2 responses), soap; Clorox, Windex, Mistolin; Comet, "Axax" (meant "Ajax") - toilets and Scrubbing Bubbles - sink; Windex (without ammonia) and Ajax; Clorox and Ajax; Crema soft bleach / Ajax powder, Windex for mirror, Fabuloso.
- **Cleaning kitchens** (e.g. washing dishes, stove, sink) was reported by 8 (88.9%) of participants. Five respondents (62.5%) indicated 1-2 hours, two (25.0%) indicated 3-4 hours and one (12.5%) responded 9 hours or more. Products used were: Mr. Clean Lemon / use fan; Palmolive soap; Clorox spray & wipes, spray degreaser for stove, Dove dishwashing liquid; Easy off spray (acid) [for] oven, Fantastic; Easy-off and Ajax w/ sponge; Mr. Musculo + vinegar + dish soap (Dawn); For oven - Mrs. Musculo / Stanley steel; Orange citrus - to remove fat from the oven, "Down" (likely meant "Dawn") - fridge, Crema Soft Bleach.
- **Cleaning glass** (e.g. windows, mirrors) was reported by 9 (100.0%) of participants. Nine participants (100.0%) indicated spending 1-2 hours per week. Products used were: Similar to Windex / sometimes use alcohol; Windex (5 responses); "Down" (likely meant "Dawn") & Windex; Windex / "Down" ("Dawn") soap.

- **Vacuuming** was reported by 7 (77.8%) of participants. One participant (14.3%) indicated 1-2 hours and six (85.7%) responded 3-4 hours. Products used were vacuum cleaner (3 responses); vacuum + broom.
- **Sweeping** was reported by 6 (66.7%) of participants. For sweeping, six participants (100.0%) responded 1-2 hours. Products used were no (none); broom (4 responses).
- **Laundry** was reported by 2 (22.2%) of participants. Two participants (100.0%) indicated 1-2 hours. Products used were: Oxyclean, bleach, Downy, Suavitel; "Down" (likely "Dawn") soap for dishes (only wash towels that were used for cleaning).

Figure 11

Cleaning Tasks in Typical Work Week



As Figure 12 indicates, most participants have worked outside the cleaning industry. Six respondents indicated: Dunkin Donuts; industrial machine handling classes, sewing and fashion

design; Dunkin Donuts (cashier), manufacturing [factory worker], printing office; taking care of kids; electronics [factory] - welding; plastic factory.

Figure 12

Previous Work Outside Cleaning Industry

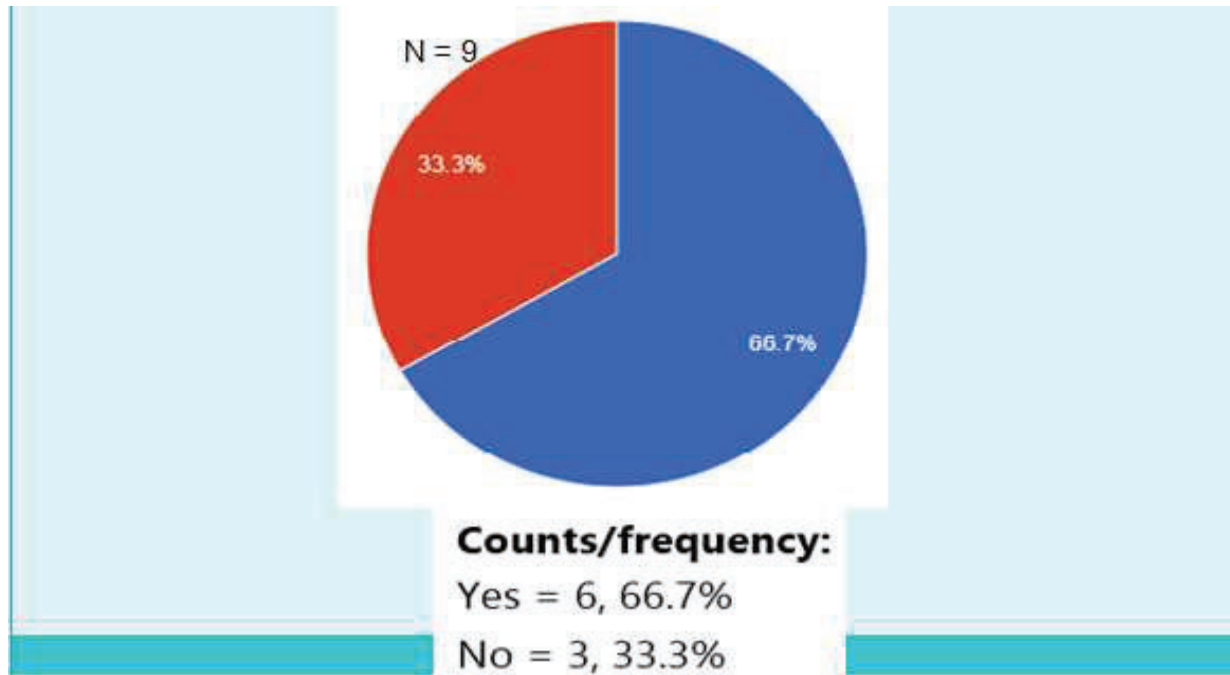
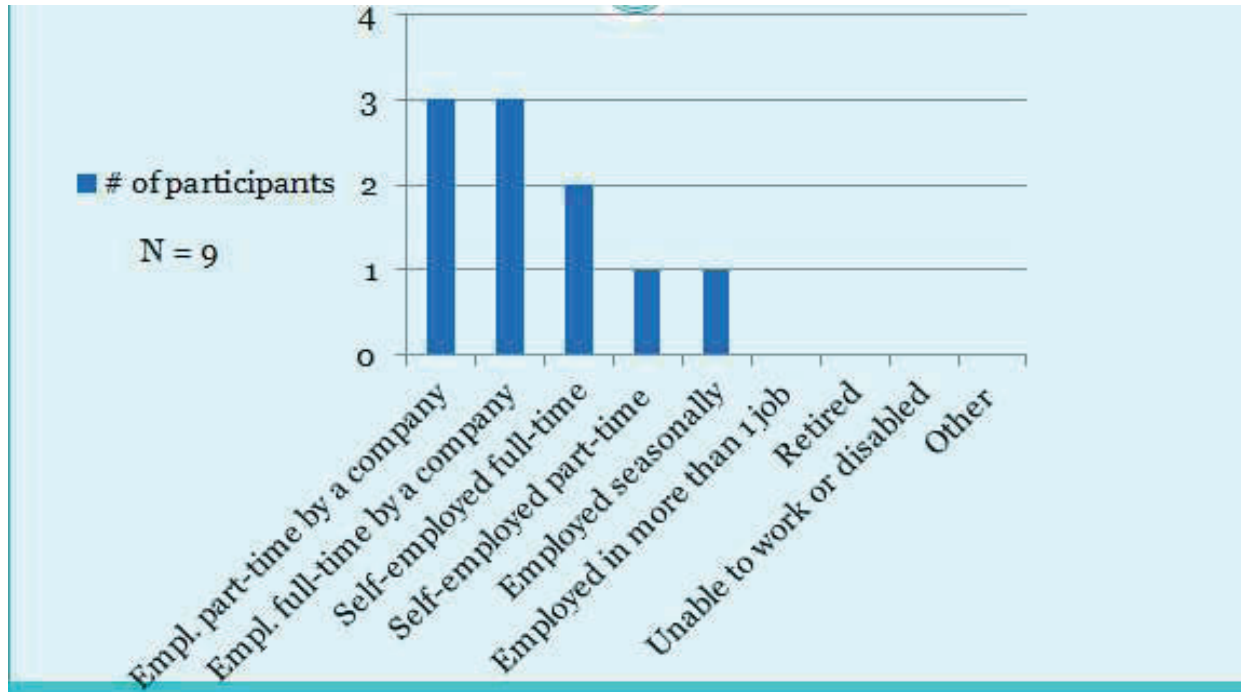


Figure 13 indicates that most participants were employed by a company either full or part-time or were self-employed full or part-time. One participant was employed seasonally.

Figure 13

Current Work Situation



When asked "How are you paid?" seven participants (87.5%) responded by the hour, and one (12.5%) by the week, and zero chose by the day. One participant, not counted in the statistics, created her own response by writing in "by the house."

Participants were also asked to indicate for what location they were paid. One participant who responded "by the hour" for job #1 indicated this was for the school where she worked. For the two respondents who had second jobs, one reported being paid by the hour for cleaning apartments and another participant indicated being paid by the week.

When asked "How often do you change brands of cleaning products?" for work, four participants (44.4%) responded "never," four (44.4%) indicated "hardly ever (every few months)," while one (11.1%) responded "sometimes (monthly)" and zero responded "all of the time (weekly)" or "most of the time (every few weeks)."

As seen in Figures 14 and 15, over half of participants clean with others they met on the job and overall, most (6 participants, 66.7%) clean with 1-4 other people.

Figure 14

Who Do You Clean With?

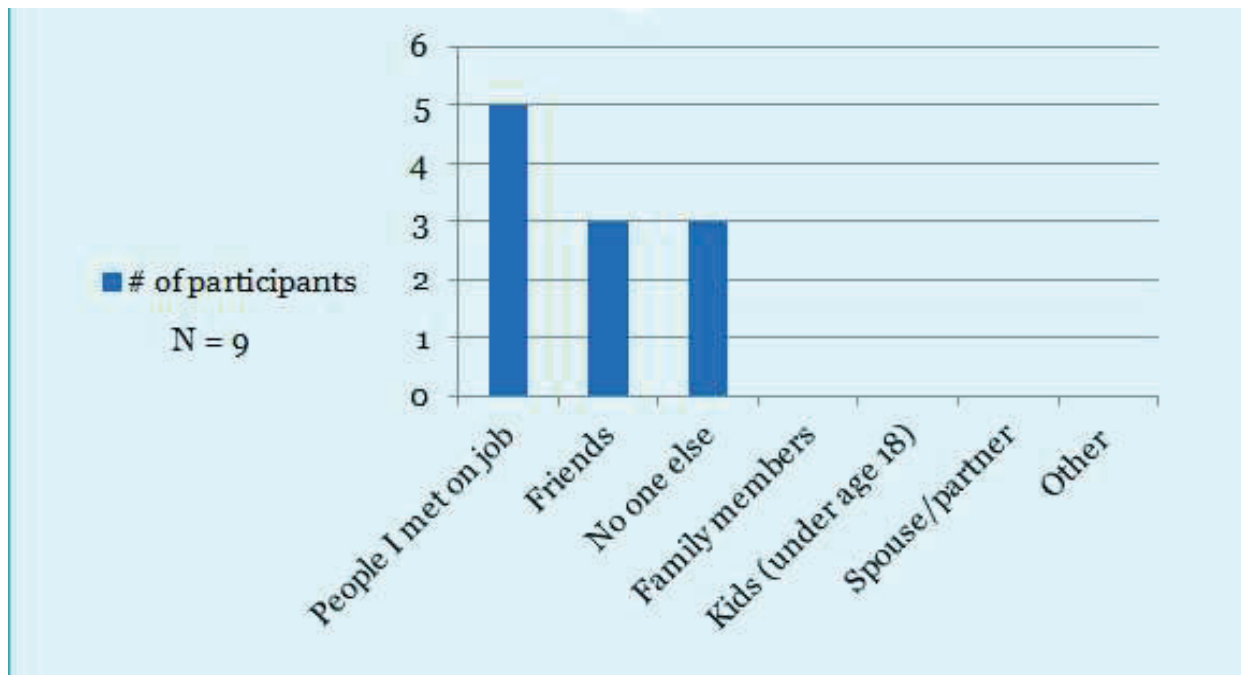
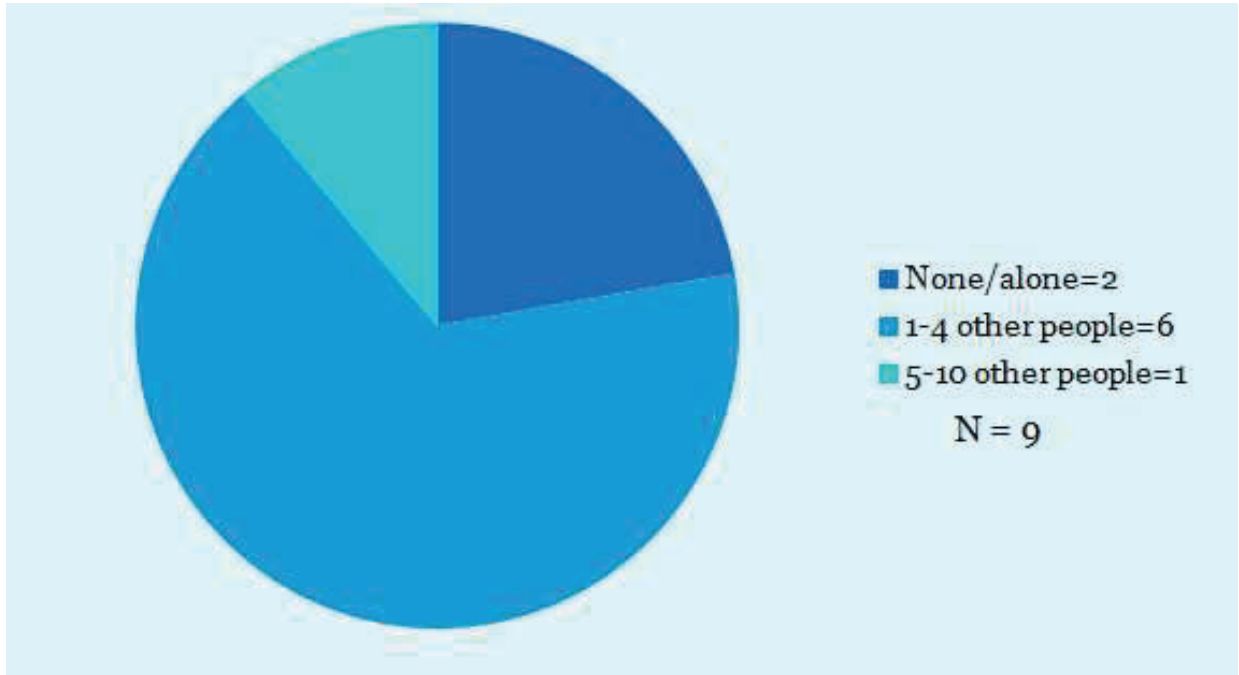


Figure 15

Number of People You Clean With

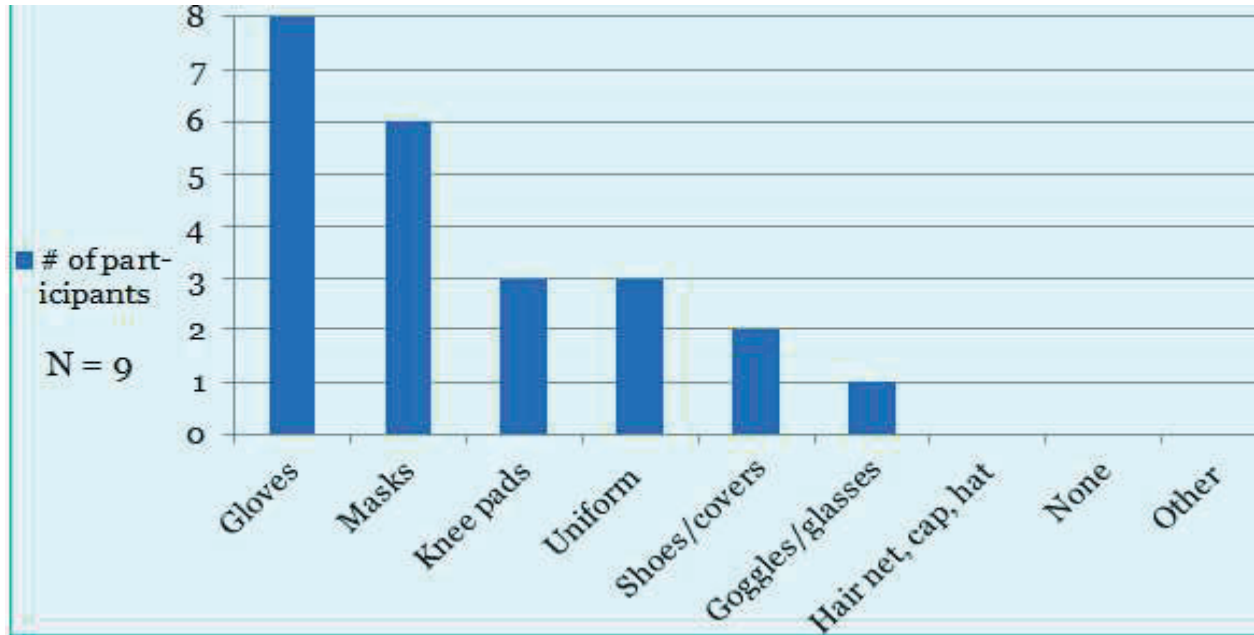


When asked "How do you get to work?" five participants (55.6%) responded "drive my own car," two women (22.2%) "take public transportation," one (11.1%) indicated "my job sends a car or van to pick me up," one (11.1%) indicated "carpool with people who I clean with," while none responded "carpool with other people." Lastly, one participant (11.1%) responded "My husband/partner drives me" and one (11.1%) indicated "Other" and wrote in "walking."

As seen in Figure 16, the participants use a variety of PPE. Most often, gloves are worn (88.9% of participants), followed by masks (66.7%), knee pads (33.3%), uniform (33.3%), special shoes or shoe covers (22.2%) and goggles or protective glasses (11.1%).

Figure 16

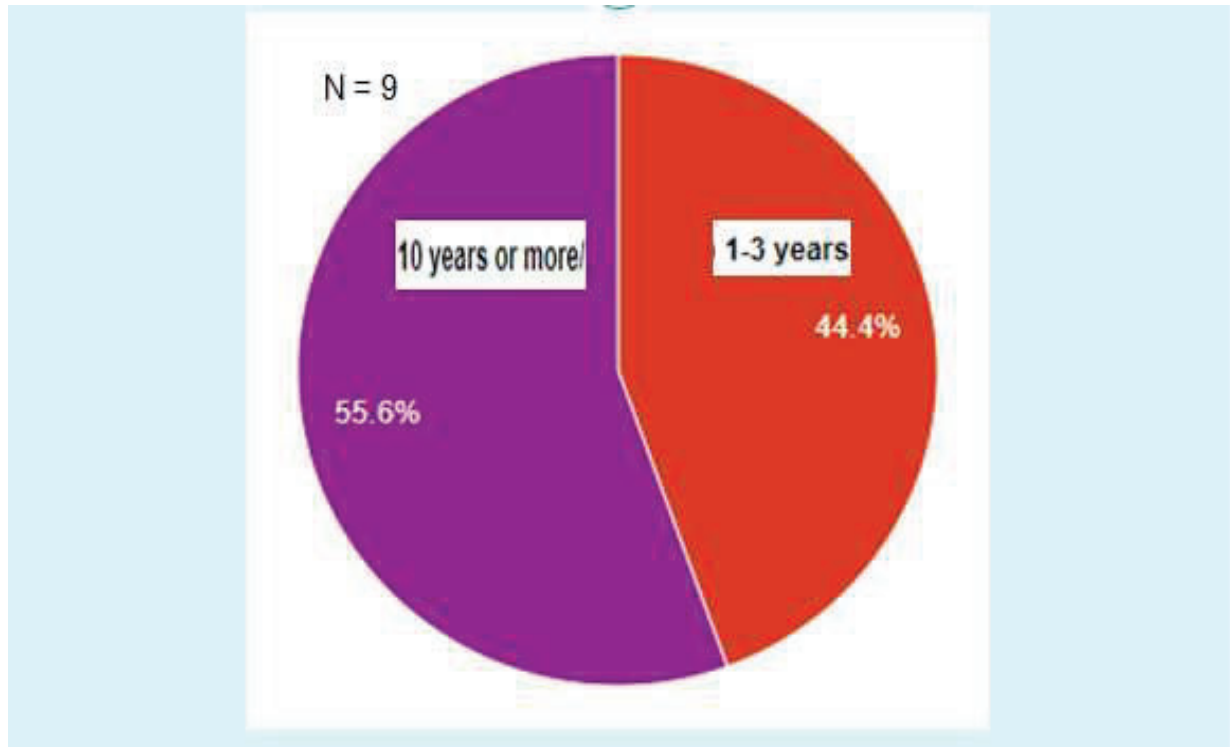
Types of PPE Typically Worn at Work



When asked "How long do you see yourself staying in this occupation?" four participants (44.4%) responded 1-3 years, and five (55.6%) indicated ten years or more. None indicated less than 1 year, 4-6 years or 7-9 years.

Figure 17

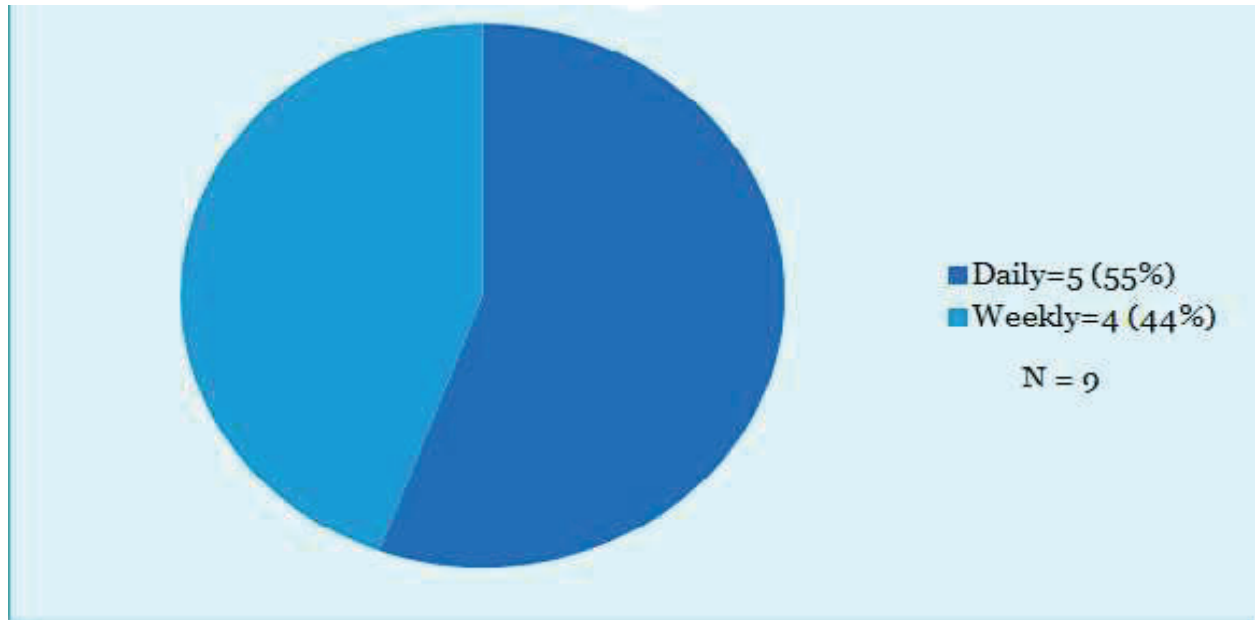
Projected Time Staying in Occupation



When asked "How often do you clean your home (other than to do dishes)?" over half of participants stated daily while the remainder answered weekly. No participants responded once a month, nor a few times per year/about once per season.

Figure 18

Frequency of Cleaning at Home

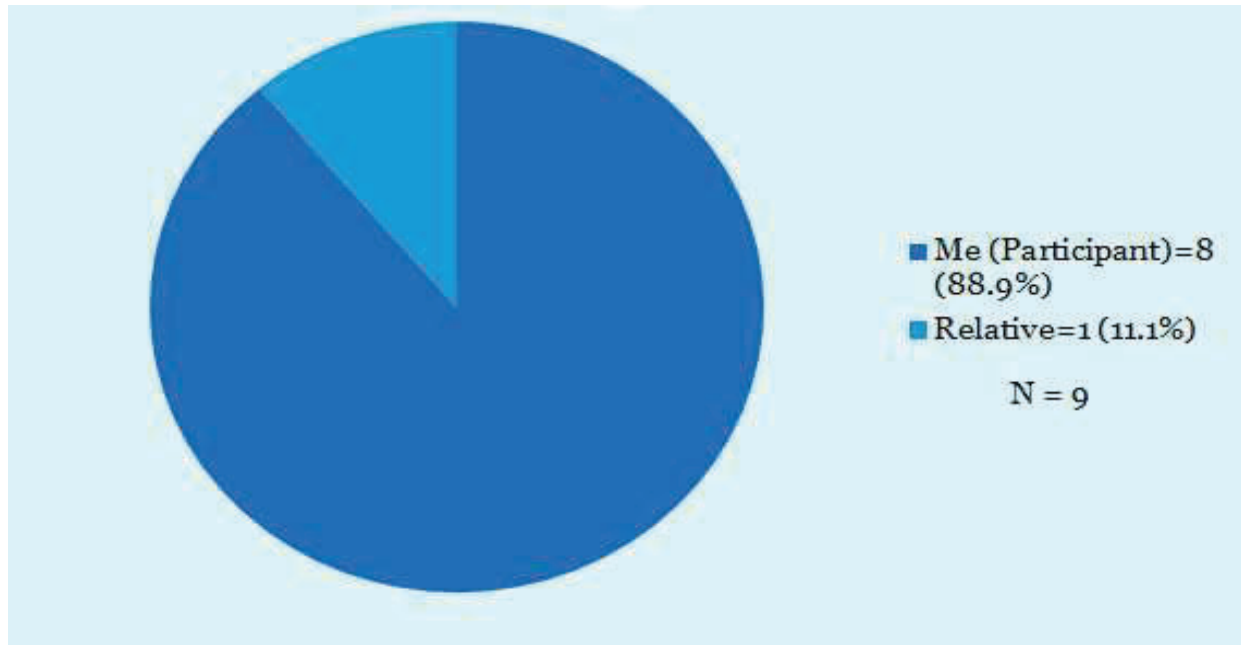


When asked, "At home, do you use different cleaning products when seasons change (for example, using more disinfectant during flu season, etc.)?" eight participants (88.9%) stated no, and one (11.1%) answered yes. The products specified for the affirmative response were Lysol and hand sanitizer.

When asked "Who does most of the cleaning in your home?" shown in Figure 19, most answered "me" (8 participants, 88.9%) while one (11.1%) responded "relative." No one responded friend, spouse or partner, kids (under age 18), or other.

Figure 19

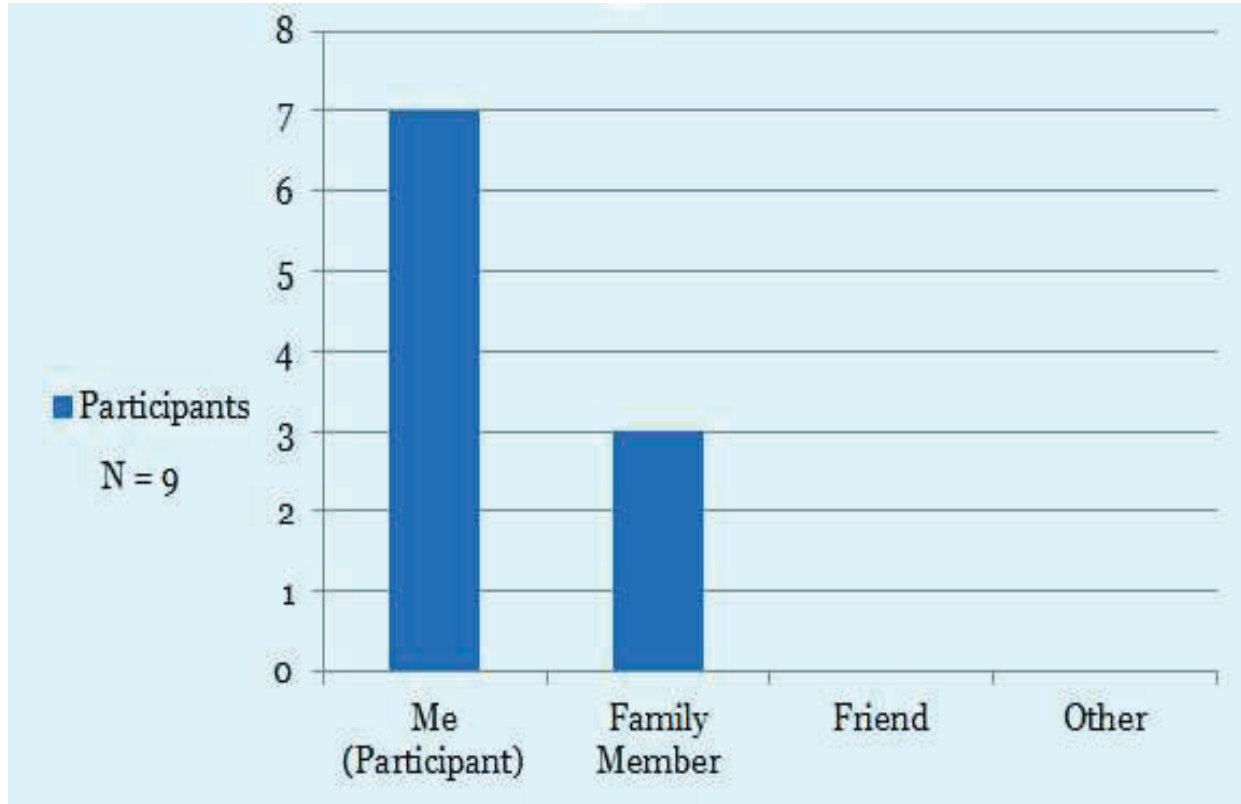
Primary Person Cleaning at Home



Seven participants (77.8%) buy the cleaning products used in their own home. Three (33.3%) indicated that family members purchase them while one participant checked both responses. When asked which family member purchases the products, participants wrote in husband (1x) and daughter (2x).

Figure 20

Person Purchasing Cleaning Products at Home



RQ 3 Summation

Taken together, the qualitative and quantitative data show that participants have organized work groups where tasks are rotated and/or shared. Most participants (88.9%) are the primary person cleaning at home, which suggests increased exposure to cleaning chemicals beyond occupational exposures. Gloves and masks were the most frequently used PPE in both the survey and focus groups, but use is not consistent, and barriers exist such as cost, availability, and training for proper use.

Research Question 4: What are the *environmental health needs* of a bicultural population of Latina women from different countries of origin and acculturation levels?

Qualitative Data for RQ4

Table 4 below shows the codes and subcodes for focus groups 1, 2 and 3, with key words and phrases in bold. The predominant codes are: Respiratory Irritation, Cancer, Headache.

The category is: Effects of cleaning chemicals, and the thematic analysis is: Cleaning affects worker health both short and long-term and combines with exposures from home.

Table 4

Environmental health needs: codes and subcodes for focus groups 1-3

Focus Group 1	Focus Group 2	Focus Group 3
<p>C: has asthma SC: "can't use bleach" SC: "you feel it here in the chest" C: skin irritation (2x) C: no health effects from cleaning SC: "no matter how many detergents and chemicals a cleaning product might have" they don't contribute to cancer C: my daughter is a cancer survivor, something caused it SC: bacon, deli meats SC: "bleach with so much detergent" SC: many causes SC: genetic C: cleaning chemicals affect us "over the long term" SC: "must be the chemicals you use at home, what she eats, the deli meats..." SC: "you can't know why she got cancer" C: "could be that many years back, it could be that it affected me, the product, or the chemical...or that it was genetic..."</p>	<p>C: left textile factory job, had no windows, poor lighting, dust SC: knew health would be bad C: "sometimes they'll use ammonia and you can't even breathe" C: ammonia is "very harmful...and that goes straight to your lungs" C: "bleach is very strong too...even if it's gentle it is harmful" SC: use it anyway SC: very strong C: elderly clients cannot take in smells from products C: bleach does give me a headache C: "all products are bad...but you have to try to use the ones that are least harmful" C: "nobody knows...what can cause cancer...because now it also seems that food, too" SC: "sometimes what makes someone sick is more what they eat...than what they do for work" SC: "could be a combination" C: "worked at [dry] cleaner, machines were right there..." SC: "that smell...the whole time I was dizzy...my head would ache...no, no...it was terrible...and I lasted eleven years there..."</p>	<p>C: "Windex with ammonia...I had a terrible reaction..." C: "they say I have to use it, the label it says it's very prohibited...that over years it causes cancer..." SC: "you have to be very careful" C: "my tongue started losing sensation [from bleach use]" C: "she tells me now that she's like choking" C: "buy an acid for us [that's] very strong...I suffer more from that...my vision and my nose...as if I can't breathe...and as I already have skin problems, it turns all red...that's why I don't use it anymore." C: knee pain (2x) SC: from cleaning bathrooms C: "I would climb around...a woman told me, you're going to fall...from the building, and if I fall my life is worth 25,000 dollars, you have to think of your life..." C: "he says use the cream, without gloves, without anything. I'm not going to do it like that I told him..." C: "they've offered me jobs like that at houses, and they pay me twelve, fifteen, I'm not giving up my lungs at this point, with the experience I have..." SC: wearing yourself out, getting allergies, poisoning myself C: "we're now losing our vision" C: knees are worn out from moving furniture C: "the chemicals we're using at work are harmful..." C: redness on the face started months ago, started from stress SC: blood is poisoned SC: like psoriasis SC: [products also cause over the long-term]"...cancer...lungs...rheumatism... vision...breathing in your nose" SC: uterine cancer from lifting the weight SC: bladder prolapse caused by the vacuum SC: tendonitis, pain in the shoulders</p>

Quantitative Data for RQ4

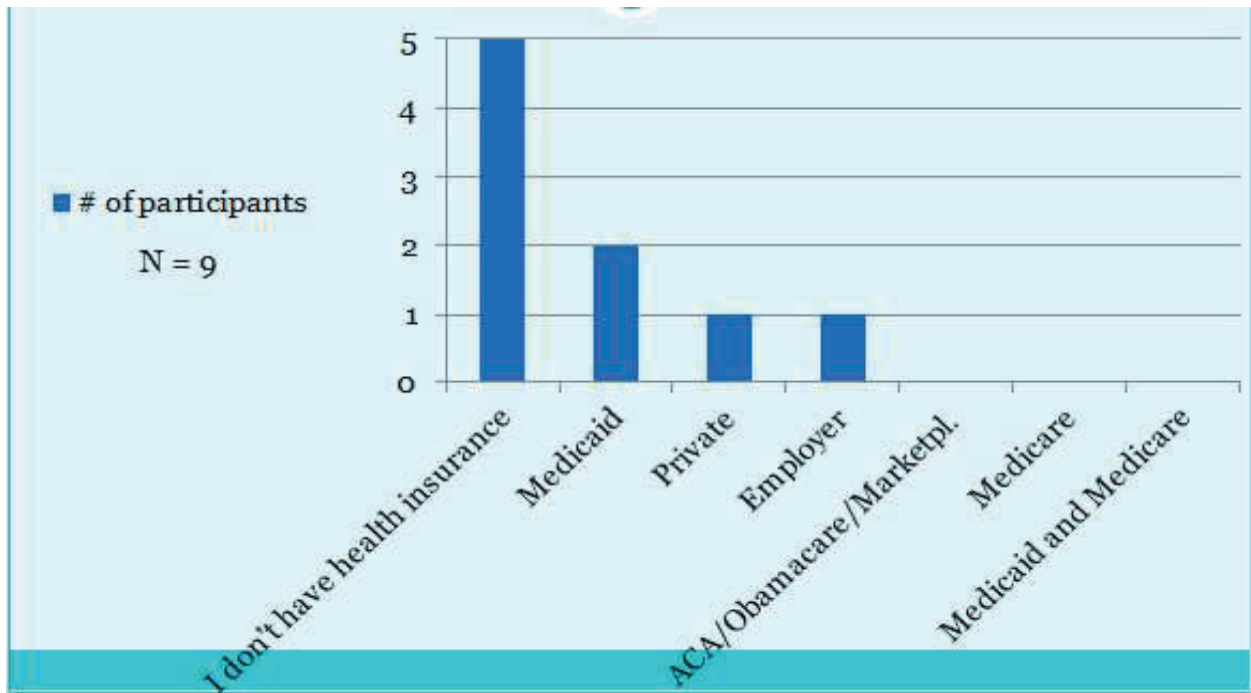
When asked, "In general, would you say that your health is..." four (44.4%) of

participants answered Good, four (44.4%) stated Fair and only one (11.1%) stated Excellent. None responded with Very Good or Poor.

When asked "What type of health insurance do you have?" many participants (five, 55.6%), indicated "I don't have health insurance" as shown in Figure 21.

Figure 21

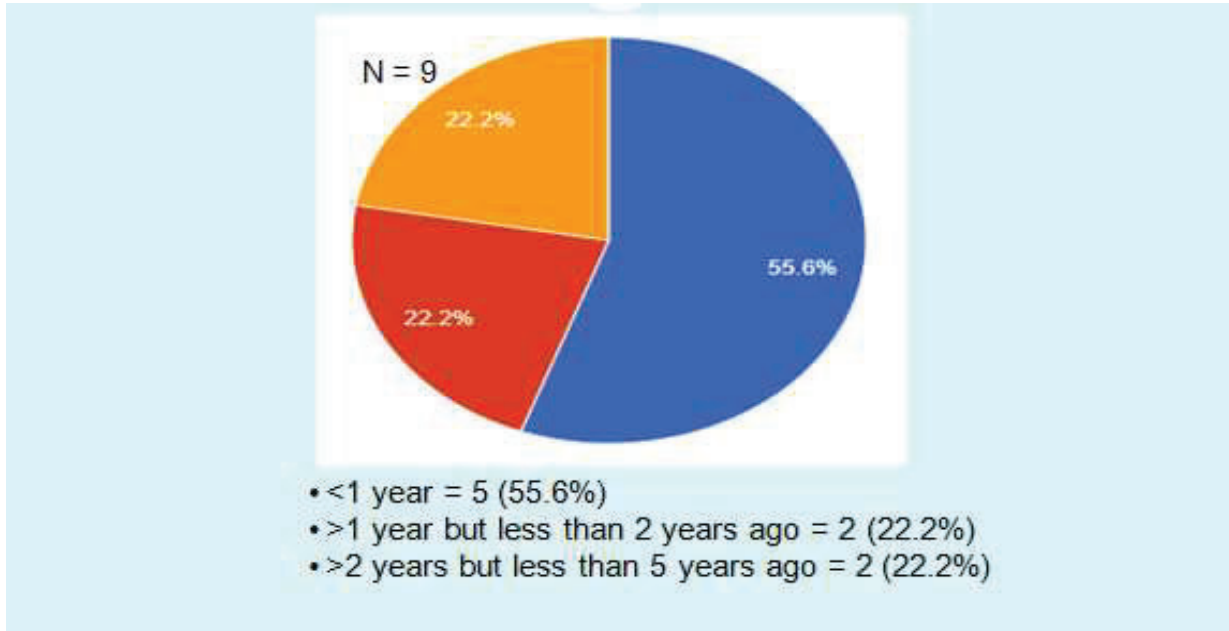
Type of Health Insurance



The survey also asked "About how long has it been since you last visited a doctor for a routine checkup? A routine checkup is a general physical exam, not an exam for an injury, illness, or specific condition." As shown in Figure 22, five participants answered Less than 1 year, two (22.2%) responded More than 1 year but less than 2 years ago, two (22.2%) stated More than 2 years but less than 5 years ago, and none stated 5 or more years.

Figure 22

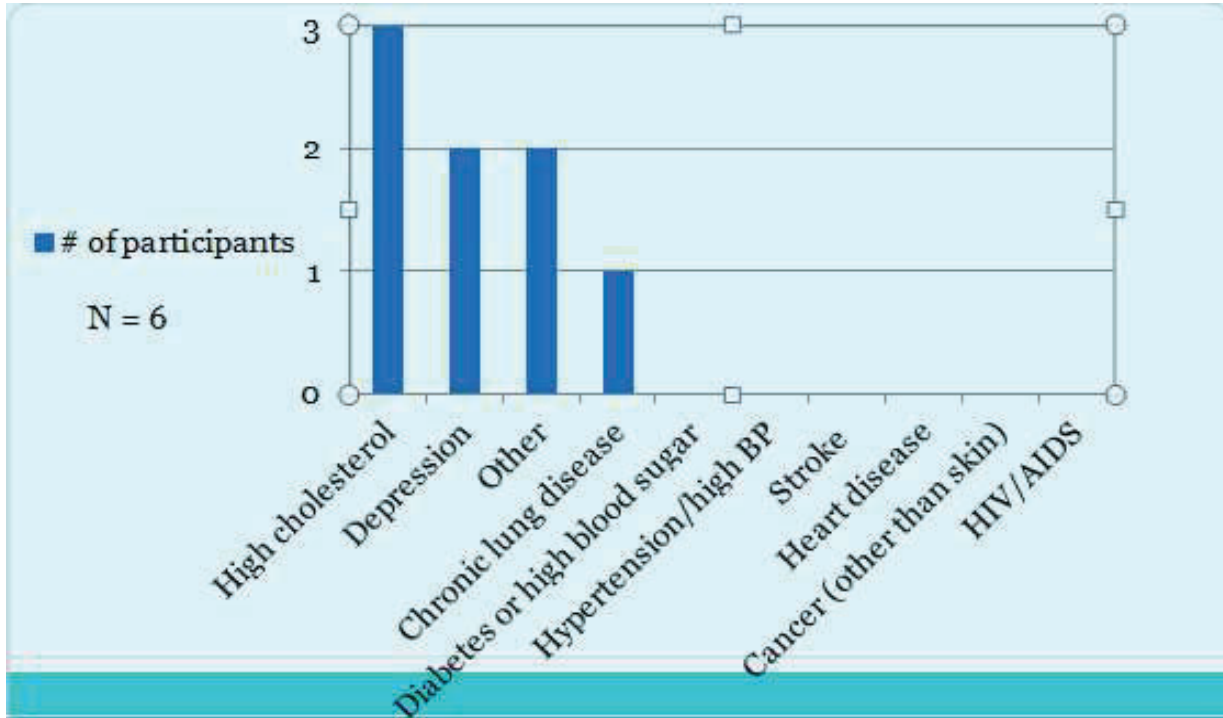
Last Doctor's Visit for Routine Checkup



As a follow-up question, participants were asked, "Has any doctor or other health care provider ever told you that you have any of the following illnesses?" six responded with the following: High cholesterol (3, 50.0%), Chronic lung disease such as asthma, emphysema, or chronic bronchitis (1, 16.7%), Depression (2, 33.3%), Other (2, 33.3%) which had write-in responses of pre-diabetes and arthritis (legs). The following had no responses: Diabetes or high blood sugar, Hypertension or high blood pressure, Stroke (ischemic or hemorrhage), Heart disease, Cancer (other than skin cancer), HIV/AIDS.

Figure 23

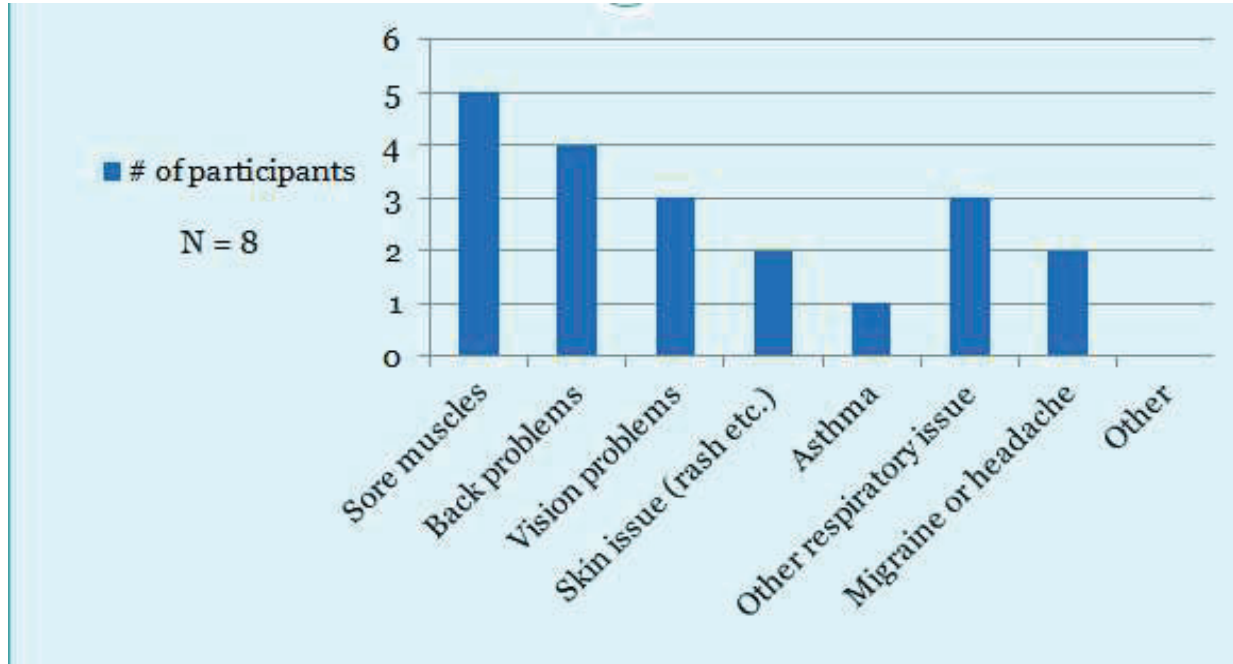
Diagnosis of Chronic Illness



The type of PPE typically worn at work also ties into RQ4. The findings were previously covered under RQ3. Another health question was, "Do you have any of the following illnesses that you believe are caused by your cleaning profession?" As Figure 24 shows, eight women checked a total of twenty responses. The most frequent was sore muscles (5 respondents, 62.5%), followed by back problems (4 respondents, 50.0%) and then respiratory issues other than asthma (3 participants, 37.5%).

Figure 24

Illnesses Caused by Cleaning Profession



Similarly, eight women also responded to "Do you use any medication (prescribed, over the counter, or herbal products) to deal with work-related health issues?" Four (50.0%) stated Yes and the other half replied No. The affirmative responses were "Melocytan paraddores" (refers to Parador, a type of acetaminophen), pain killer, allergy pill + Tylenol, shoulder acupuncture.

RQ 4 Summation

Taken together, the qualitative and quantitative data show that the environmental health needs of this population are complex and varied. Respiratory and dermal issues were reported, which is supported by the literature, as well as other concerns such as sore muscles and back problems. Cancer was discussed by participants several times, with much confusion as to what, if anything, may cause cancer. The roles of genetics, food, and chemical exposures were of great

interest and a variety of opinions on the topic were discussed, suggesting a need for further education.

Research Question 5: What are the *cleaning products used by* a bicultural population of Latina women from different countries of origin and acculturation levels?

Qualitative Data for RQ5

Table 5 below shows the codes and subcodes for focus groups 1, 2 and 3, with key words and phrases in bold. The predominant codes are: Price, what works, what's provided.

The category is: Decisions on products used and the thematic analysis is: Use of cleaning products is driven by price and efficacy when given a choice.

Table 5

Cleaning products used: codes and subcodes for focus groups 1-3

Focus Group 1 (behaviors)	Focus Group 2 (behaviors)	Focus Group 3 (behaviors)
C: buy products "at Costco" C: look for what's on sale C: "at the supermarket...Costco when there's coupons " SC: "buy what's more or less at a price that we can afford " C: "Tide or Gain laundry soap... fabric softener...Clorolox...Windex" C: Fabuloso (3x) C: Suavitel C: " bleach to disinfect " C: Clorox in the sink SC: Clorox in the sink C: Fantastic for the tables C: we never look at the labels C: labels, everything English SC: ninety percent English C: cleaning products provided at houses (2x) C: Buys own products for work SC: same products used at home	C: purchases own supplies for work C: buys cleaning products locally SC: doesn't use ammonia SC: uses bleach alternative C: product name ECD for the stove C: woman/homeowner wants bleach used but agency says no to strong products SC: uses strong products, against agency policy...to clean well C: dish soap for stoves C: school provides everything needed to clean there SC: house owners also provide everything needed C: most often, uses vinegar and water mixture to clean at work	C: use a cream to shine elevator doors C: products provided at houses SC: we also make recommendations C: asked homeowner to buy window cleaner without ammonia C: I use kitchen soap instead C: university gives us products, we have to use them SC: label says it's prohibited C: they give us bleach, green soap, another soap, Fabuloso and Windex C: "now they've given us these tablets to make certain things shine" C: sometimes use Easy off and Mr. Muscle C: magic sponge C: when people move out from apartment, use stronger products

Quantitative Data for RQ5

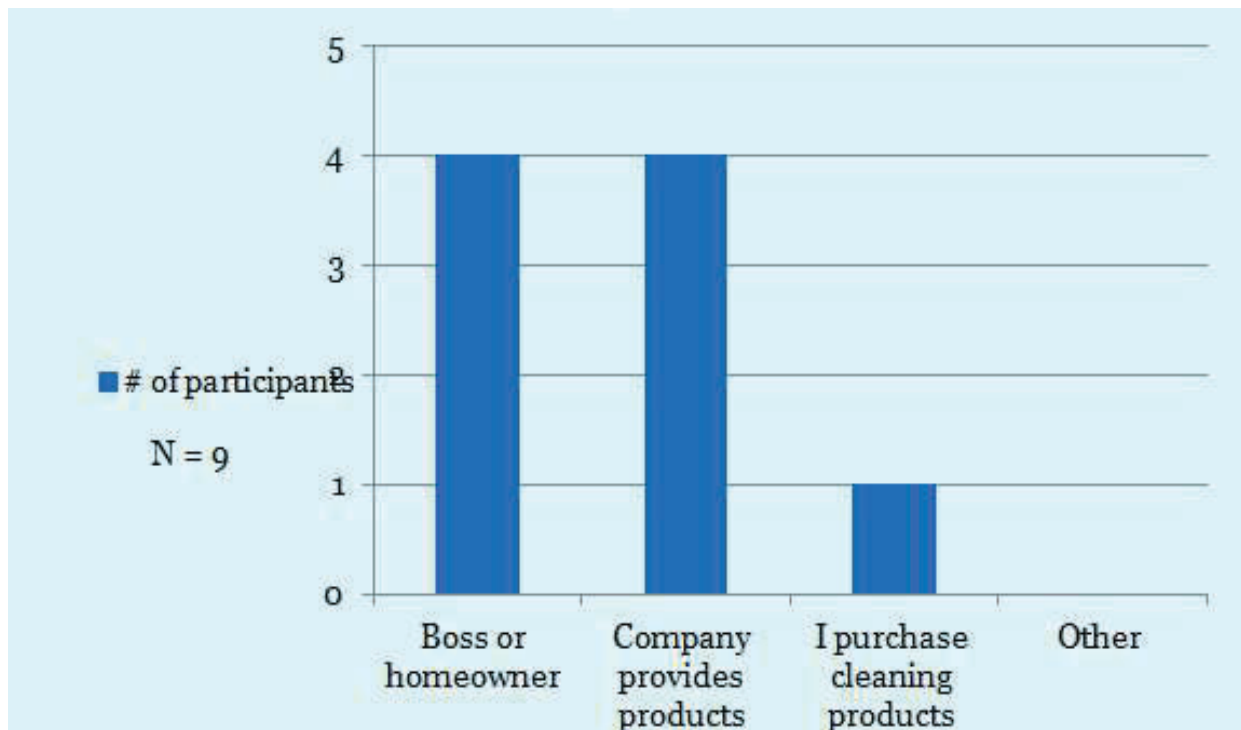
As Figure 25 summarizes, when asked, "Who buys the cleaning products that you use for work?" participants responded:

- I purchase my own cleaning products (1, 11.1%) and write-in cleaning place/location: "exclusive store cleaning products"

- The boss or homeowner purchases them (4, 44.4%) and the cleaning place/locations: "House room," "house," "all"
- The company provides the products (4, 44.4%) for the cleaning place/location: "school / apartments," "does not know" and "apartment"
- Other (0, 0.0%).

Figure 25

Who Purchases Cleaning Products at Work

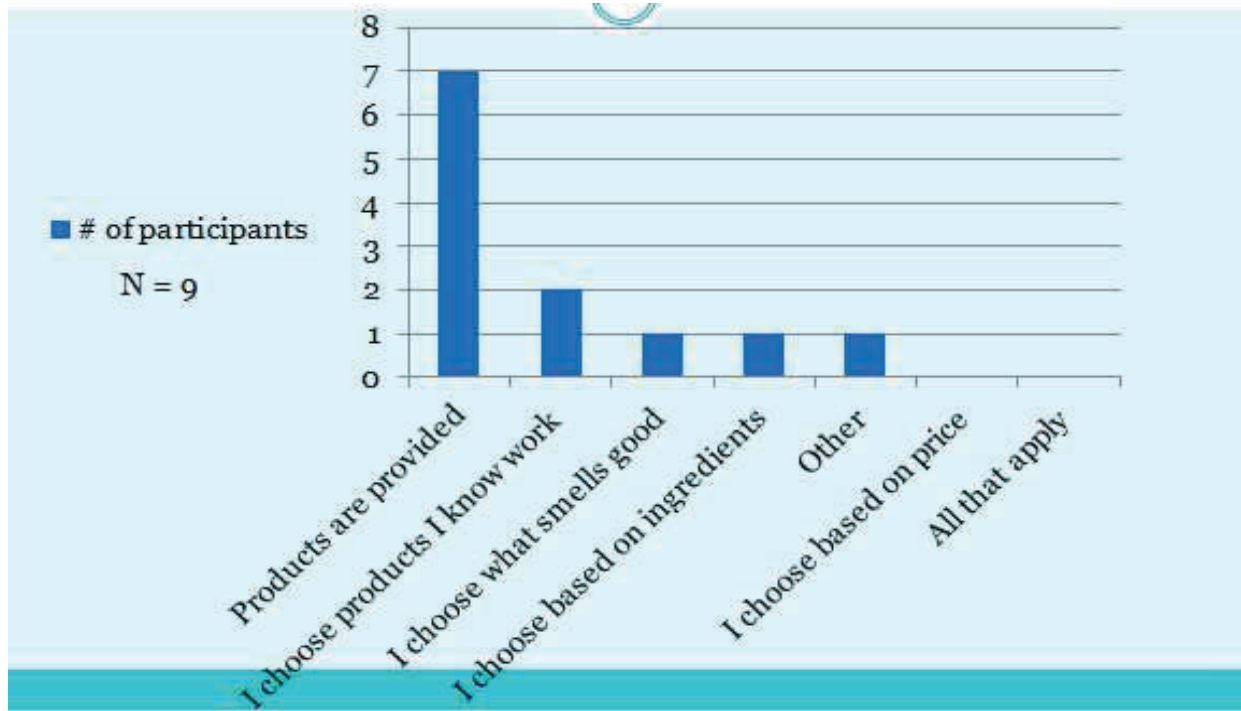


When asked "How often do you change brands of cleaning products?" none responded All of the time (weekly) or Most of the time (every few weeks) (0, 0.0%), one stated Sometimes (monthly) (11.1%), and four (44.4%) responded Hardly ever (every few months) and four (44.4%) responded Never.

When asked, "Why do you choose these products?" most answered The products are provided for me, so I don't have a choice (7, 77.8%), while others selected: I choose what smells good (1, 11.1%), I choose the products that I know work (2, 22.2%), I choose based on the ingredients. (1, 11.1%), Other (1, 11.1%). None (zero) chose: I choose based on price and All that apply (0, 0.0%).

Figure 26

Reasons for Purchase of Cleaning Products



The focus group participants were asked to "Please write a list of five products you use at home (all-purpose cleaner, toilet cleaner, tub and tile cleaner, window cleaner, etc.)." The responses are organized by room, in Table 6.

Table 6

Products Used at Home

<u>Kitchen</u> vinegar (3x) bicarbonate soap Palmolive Soap Downny bleach 409 - grease Dawn - grease degreaser - stove dish soap (Dawn) - dishes vinegar - stove dove dish - dishes Mr. Clean	<u>Bathroom</u> Clorox (2x) Soft bleach Bleach Bobbles x clean bath vinegar (3x) Clorox liquid baking soda degreaser (bathtub) bicarbonate (bathtub) vinegar (bathtub) span bubble (bathtub) dish soap (toilet) bleach (toilet bowl)
<u>Floor</u> Murphy Oil Mistolin (2x) vinegar (3x) baking soda Fabuloso (3x) Pinesol	<u>Other</u> Oxyclean - laundry Span Bubble - hand wash vinegar - crystals, marble vinegar - wall water - dust removal lemon oil - furniture (wood) Lysol - air freshener Lysol - surfaces sodium bicarbonate
<u>Windows/glass/mirrors</u> Windex (6x)	

The last survey question corresponding to RQ5 was already discussed under RQ3: "At home, do you use different cleaning products when seasons change (for example, using more disinfectant during flu season, etc.)?" Only one (11.1%) responded Yes and wrote in Lysol and hand sanitizer while most stated No (8 respondents, 88.9%).

RQ 5 Summation

Taken together, the qualitative and quantitative data show a range of behaviors regarding product use. For participants who purchase their own products, price is a driving factor in the decision-making process. The most popular products for home use include major brands such as Windex and bleach as well as natural cleaners such as sodium bicarbonate and vinegar, which

are economical and effective. There was an emphasis on “having to use” certain products, as dictated by the employer.

RQ 1-5: Summation

A summation of Research Questions 1-5 with corresponding themes and constructs of the Social Cognitive Theory can be seen in Table 7 below.

Table 7

Summation

Research Question	Corresponding Theme	Corresponding Constructs in Social Cognitive Theory
For a bicultural population of Latina women from different countries of origin and acculturation levels who work in cleaning occupations in NJ:		
RQ1: What is the <i>knowledge</i> base specific to cleaning procedures (via training experiences)?	Training	- Observational learning (modeling) - Reinforcements
RQ2: What are the <i>attitudes</i> regarding the presence of chemicals in cleaning products?	Products - Attitudes	- Expectations - Reinforcements
RQ3: What are the <i>cleaning routines</i> (behaviors)?	Cleaning routines	- Behavioral capability - Reinforcements - Self-efficacy
RQ4: What are the environmental health <i>needs</i> ?	Environmental health needs	- Reciprocal determinism
RQ 5: What are the <i>cleaning products used</i> (behaviors)?	Products - Behaviors	- Behavioral capability - Reinforcements

Additional Results

The PI maintains a research focus on environmental health, and therefore highlights the following excerpts from the focus group transcripts focused on *environmental health needs* (RQ#4):

- “Bleach is very bad...because it’s strong...it reaches the lungs.” (FG1)
- “It [bleach] even gives you a headache.” (FG1)
- “I have asthma...when you breathe it [bleach] in or something, you feel it here in the chest...but it’s good because it whitens things...” (FG1)
- Participant discussing daughter’s breast cancer: “She had breast cancer because...my daughter doesn't drink, doesn't smoke, has never smoked, and you'd say, but it must be the chemicals you use at home, what she eats, the deli meats you eat...” (FG1)
- Daughter: “... it could be that many years back, it could be that it affected me, the product, or the chemical... or that it was genetic...” (FG1)
- “sometimes they’ll use ammonia and you can’t even breathe...” (FG 2)
- “I agree with her... because it’s very harmful...and that goes straight to your lungs...” (FG 2)
- “...bleach does give me a headache...” (FG 2)
- “...I worked at the, at a cleaner... but where we did the ironing, the machines where they did the dry cleaning were right there... so the whole time there was that smell (breathes in dryly)... the whole time I was dizzy... my head would ache... no, no... it was terrible... and I lasted eleven years there...” (FG 2)
- “...on the label it says it’s very prohibited...that over the course of years it causes cancer (...) the head, the eyes, all of that...you have to be very careful.” (FG 3)

- “..so one day when my tongue started losing sensation...” [from using bleach] (FG 3)

Emergent Themes

There were three emergent themes: Home Country, Cultural Identity, and Use of PPE.

Emergent Themes 1 & 2: Home Country & Cultural Identity

Table 8 below shows the codes and subcodes for focus groups 1, 2 and 3, with key words and phrases in bold. The predominant codes are: Proud, Large family, Loyal to roots back home, Worked hard. The category is: Home country & cultural identity and the thematic analysis is: Life in home country was hard and grounded by family ties.

Table 8

Home Country & Cultural Identity

Focus Group 1	Focus Group 2	Focus Group 3
<p>C: "Latino, something to be proud of!" SC: "My roots, my culture" SC: "one hundred percent Dominican" SC: "my roots, can't erase them" C: "feel[ing] like you're from your country too..." C: "we came to struggle...to this country" C: "very hard-working...we're sociable" C: "we have that human warmth, full of love" C: "our roots are there" SC: "we're different" C: "different in every way" C: love this country too C: "proud of being Latinos" C: don't use product label, use traffic light system - high level red, middle level, then green SC: Purchase low level or medium</p>	<p>C: "I have seven brothers" C: "were a poor family" SC: family of eight children C: worked in agriculture with dad C: "I picked peanuts, peeled peanuts, tied tobacco" C: working as a child SC: the first of 11 siblings SC: "tend to the animals" SC: grew fruit and sugar cane SC: cooked for agricultural workers SC: school from eight to twelve...then work SC: handled industrial machinery C: immigrated due to war in 1988</p>	<p>C: "people who don't value work of Hispanic people C: here "all Hispanics working as cleaners" C: "Peru countryside...that fresh air helps a lot..." C: "even in Lima, there's terrible pollution"</p>

Emergent Theme 3: Use of PPE

Table 9 below shows the codes and subcodes for focus groups 1, 2 and 3, with key words and phrases in bold. The predominant codes are: Gloves often, Masks sometimes, Need better, need more. The category is: Home PPE on the job and the thematic analysis is: Use of proper PPE is inadequate and often not supplied on the job, resulting in multiple barriers.

Table 9

Use of PPE

Focus Group 1	Focus Group 2	Focus Group 3
<p>C: "even have the gloves for cleaning"</p> <p>C: "normally we don't use masks or gloves" at home but uses gloves at work</p> <p>C: "normally ninety percent of us don't use masks" at work</p> <p>C: wears mask when using bleach at work</p>	<p>C: purchases own masks, gloves</p> <p>C: wears mask</p> <p>C: doesn't wear mask</p> <p>C: almost never wears a mask</p> <p>C: buys masks for work</p> <p>C: wears gloves, not mask</p>	<p>C: do wear gloves (2x) at work</p> <p>C: gloves given at work are uncomfortable</p> <p>SC: "so I bring, I buy [my own gloves]"</p> <p>SC: bosses don't listen to what we need</p> <p>C: used to clean a lab, and woman kept buying me wrong size gloves</p> <p>C: institutions give "these crappy materials for their employees"</p> <p>C: given a mask at work (2x)</p> <p>SC: "doesn't help us with the smell...it's for the dust"</p> <p>SC: "I had to bring a mask..for...the smell"</p> <p>C: "if we join together...I do believe that if we ask, they will agree"</p> <p>C: wear a girdle also, requested from employer and it was given</p> <p>C: boss told to use gloves and throw them away</p> <p>SC: don't give enough gloves (2x)</p> <p>SC: say they give masks but don't</p> <p>C: "products over the long term are harmful to anything in the body...that's why the masks are very important...I believe...right?"</p>

Chapter V

DISCUSSION

Using the Six Constructs of the Social Cognitive Theory as a Lens

The Social Cognitive Theory (SCT) proved instrumental as a lens through which to assess the study findings. Bandura emphasizes "...people are self-organizing, proactive, self-regulating, and self-reflecting. They are contributors to their life circumstances not just products of them" (2005). The study's three focus groups created an opportunity to witness the six constructs of SCT through the voices of the 15 Latina women who work in cleaning occupations. Their stories reflect Bandura's six constructs and his writings on SCT in cultural context, which reflected many of the participants' life experiences via what Bandura terms a more "collectively oriented society" that is "highly communal" (Bandura, 2002, p. 275).

Construct 1: Reciprocal determinism

Reciprocal determinism was discussed by participants via the many health effects they experienced, as shown in Figure 24: Illnesses Caused by Cleaning Profession. Similar health effects – many of them respiratory and dermal – were discussed in the literature. For example, Garza et al. used a Green Cleaning & Health Survey to explore symptoms and exposures to traditional and environmentally preferable cleaning products (2015). Findings included dermal, upper/lower respiratory, asthma, & musculoskeletal (back pain, upper/lower extremity symptoms) but did not explore long term health effects such as cancer (Garza et al., 2015). One of the most concerning health effects was Svanes et al. finding "accelerated lung function decline

in women after both occupational cleaning and cleaning at home. The effect size was comparable to 10 to 20 pack-years of tobacco smoking” (Svanes et al, 2018, p.1158). The health risks of cleaning daily may be mitigated through an effective intervention.

Construct 2: Behavioral capability

Participants voiced a desire for more training, which would enhance their behavioral capability, and enable them to choose safer cleaning practices, including using adequate protection via PPE. The literature speaks to the need for knowledge and skill needed to work effectively, as Latinas often work in informal networks and train each other. For example, Hondagneu-Sotelo interviewed 17 Latinas and observed their "domestics networks” or informal ways of workers training each other and providing tips on negotiating pay, getting jobs, and more (1994).

Construct 3: Expectations

Focus groups discussed the expectations and unexpected health outcomes from their cleaning practices. The literature speaks to a range of adverse health outcomes from cleaning procedures and product use. For example, Gerster et al. surveyed 1476 professional cleaning companies in Switzerland, and identified 132 chemicals in 105 products including fragrances, glycol ethers, surfactants and solvents) which are mostly dermal and respiratory irritants (2014). While some of the focus group participants had a general awareness of such potentially harmful ingredients, others did not express this awareness.

Construct 4: Self-efficacy

Participants discussed their self-efficacy related to ability to move forward, overcoming barriers such as poverty, health and language issues, and lack of resources for working in the cleaning occupation. This confidence in the ability to take action and overcome barriers was also reflected in the literature. For example, Hsieh et al. interviewed 27 female Latina hotel housekeepers and found they experience array of policy and interpersonal-related mistreatment, including lack of personal protective equipment, low pay, disrespect and verbal abuse as well as barriers including job insecurity and immigration status (2016).

Construct 5: Observational learning (modeling)

Participants discussed learning how to clean from a very young age, reflecting observational learning (modeling). They learned at home, from family members, as an integral part to growing up in their home countries. This continued for many women in their occupation, where they learned cleaning techniques from each other often in the absence of – or in addition to – formal training. Informal training supported by each other on the job, ties into the literature that suggests this occurs by workers observing each other and sharing tips. For example, Hondagneu-Sotelo (1994) interviewed immigrant Latinas to better understand domestic workers who create informal networks while Hsieh et al. (2016) also noted observational learning among hotel workers.

Construct 6: Reinforcements

Reinforcements were discussed in the many ways the women support each other within informal job networks, such as a mother and daughter who clean together, or a small group who

clean in the same building. The literature discusses how women in informal networks support each other and share information by mirroring each other's advice and giving expertise to the group (Hondagneu-Sotelo, 1994). Bandura refers to this as a "socially interdependent effort...to pool their knowledge, skills, and resources, provide mutual support, form alliances, and work together to secure what they cannot accomplish on their own." (Bandura, 2002, p. 270).

Essential Occupational Cleaning Workers

At the time this research was conducted, the world had not witnessed the extreme devastation of COVID-19. As this pandemic emerged and continues to ravage communities on a global scale, the discussion of essential workers and of PPE use has undertaken an entirely new urgency. Those who clean houses, apartments, schools, daycares, and universities - as exemplified in this research - now help protect health in spaces both public and private. The importance of cleaning processes has been brought to a whole new level perhaps not experienced since the 1918 flu. The importance of training - and lack of consistent, uniform instruction on best practices in cleaning - has never been so urgent. The need for PPE, and the need for consistent, proper use remain some of the most pressing issues in public health.

This study lays the groundwork for a future intervention to empower Latinas in cleaning occupations - and employers across private and public sectors - to make cleaning training and PPE available regardless of a pandemic. The intervention may be most effective via community-based participatory research (CBPR) that involves local stakeholders, Latina cleaning professionals and researchers collaborating together.

Chapter VI

CONCLUSION

This study was designed to improve community health in northern New Jersey through gaining a comprehensive understanding of the knowledge, attitudes, behaviors, and environmental health needs of Latinas in cleaning occupations. The findings will help in creating a future health intervention for this population.

Latinas in cleaning occupations in northern NJ face a range of social and health barriers including lack of training, inadequate PPE, low literacy and health issues ranging from short term (skin rashes) to long-term (cancer). The barriers found in this population are compounded by daily environmental exposures from occupational and home cleaning practices. To address these issues, the development of an intervention is warranted to provide training and resources for this critical population of essential workers.

Limitations

This research utilized non-probability sampling, which was in this case, purposive. Therefore, this study is only generalizable to the participants in the study. Additionally, recruitment only from ESL classes for parents and their friends/family members at one northern NJ high school limited the number of study participants to fifteen. A multi-site study including a larger number of women from a more diverse range of geographical areas would have allowed for comparisons to be made between locations. Additionally, this research is cross-sectional, and thus did not allow for a longitudinal study of the participants over time, which would allow for a

more comprehensive picture of the situation. While the focus groups were audio recorded, they were not video recorded, which increased the PI and PIA inability to accurately 100% of the time identify which participant was speaking. Finally, the focus group participation seemed affected by seasonal variability, including weather and daylight for participants from the community without personal transportation and thus could have impacted the number of participants who attended Focus Groups 3 and 4, which were held in October 2019 and February 2020, respectively. However, given the limitations noted, the findings do offer insight into the knowledge, attitudes, behaviors and environmental health needs of Latinas in cleaning occupations in northern New Jersey.

Future Research

This research study lays the foundation for a future intervention to empower Latinas in cleaning occupations towards a healthier work environment. As expressed in the focus groups and survey, participants have a desire for more training, preferably via a text-based intervention which will make it accessible on the job and at home. The intervention must be culturally and linguistically appropriate. This can be achieved via community-based participatory research (CBPR) to engage members of the Latina cleaning community. An integrated partnership of community advocates, cleaning professionals and researchers will help create a comprehensive intervention to advance healthier occupational cleaning practices.

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Appendix A

Seton Hall University Pre-IRB Approval Form

PRE - IRB FORM

Pre-IRB review is mandatory for all proposals. Proposals that do not have a pre-IRB review will not be considered by the IRB and will be sent back to the investigator.

Pre-IRB form to be filled by the department/schools:

Investigator(s): Erin Ihde, MA, CCRP

Proposal Title: Knowledge, Attitudes, Behaviors and Environmental Health Needs of Latinas in Cleaning Occupations

Required statement by pre-IRB reviewer:

I have reviewed the proposed research. I state that:

- a) the question(s)/hypothesis of the research is sound and is clearly stated;
- b) the study design is appropriate to answer the question(s) or prove the hypothesis of the research;
- c) the research has reasonable likelihood of contributing to generalizable knowledge.

My signature (1) affirms that the proposed research is scientifically sound, and (2) represents my approval of the research.



Pre-IRB reviewer's signature

Nagle, PaRBcte chair

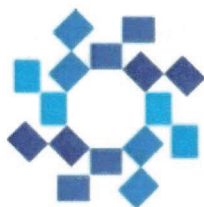
Pre-IRB reviewer's name and title

5/8/19

Date

Appendix B

Hackensack Meridian Health (HMH) IRB Approval



Hackensack
Meridian *Health*

EXPEDITED REVIEW APPROVAL

From: [Derek Hanson, MD](#)

To: [Erin Ihde](#)

CC:

Re: Study# [Pro2019-0015](#)
Knowledge, Attitudes, Behaviors and Environmental Health Needs of Latinas in
Cleaning Occupations

Study Expiration Date: 7/10/2020

Study Approval Date: 7/11/2019

This is to advise you that the above Study has been presented to the Institutional Review Board for expedited review.

Please be reminded that all modifications to approved projects must be reviewed and approved by the Institutional Review Board before they may be implemented. Any changes to this protocol must be submitted for IRB approval before initiated.

All serious adverse events and unexpected adverse events must be reported to Institutional Review Board within seven days.

Please do not make any changes to the IRB approved consent without approval of the IRB. Only the IRB stamped approved consent should be used.

If your study meets the definition of a qualifying study that meets the FDAAA 801 definition of an "applicable clinical trial", you are responsible for ensuring that the trial has been registered properly on the Clinical Trials.gov website prior to the enrollment of any subject.

"Applicable clinical trials" generally include controlled clinical investigations, other than phase 1 clinical investigations (with one or more arms) of FDA-regulated drugs, biological products, or devices, that meet one of the following conditions:

- * The trial has one or more sites in the United States
- * The trial is conducted under an FDA investigational new drug application or investigational device exemption
- * The trial involves a drug, biologic, or device that is manufactured in the United States or its territories and is exported for research

For complete statutory definitions and more information on the meaning of "applicable clinical trial," see [Elaboration of Definitions of Responsible Party and Applicable Clinical Trial \(PDF\)](#).

HIPAA waiver granted.

Important news about our email communications.

Hackensack Meridian Health Network has implemented secure messaging services. If you need assistance with retrieving a secure email, please send an e-mail to postmaster@hackensackmeridian.org

Confidentiality Notice:

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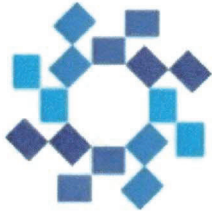
Hackensack Meridian Health Network
30 Prospect Avenue Hackensack, New Jersey 07601 551-996-2000
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Appendix C

HMH IRB Approval for Amendment 1

Ihde, Erin

From: eResearch@HackensackMeridian.org
Sent: Friday, July 26, 2019 8:17 AM
To: Ihde, Erin
Subject: eResearch: Amendment Approved



Hackensack
Meridian *Health*

Amendment approved

ID: [Ame1_Pro2019-0015](#)
Title: Amendment 1 for IRB Study #Pro2019-0015
Description: Your amendment has been approved. To navigate to the project workspace, click on the above ID.

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Appendix D

HMH IRB Approval for Amendment 2

Ihde, Erin

From: eResearch@HackensackMeridian.org
Sent: Friday, August 16, 2019 10:35 AM
To: Ihde, Erin
Subject: eResearch: Amendment Approved



Hackensack
Meridian *Health*

Amendment approved

ID: [Ame2_Pro2019-0015](#)

Title: Amendment 2 for IRB Study #Pro2019-0015

Description: Your amendment has been approved. To navigate to the project workspace, click on the above ID.

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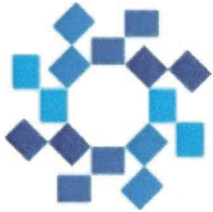
Hackensack Meridian Health Network
30 Prospect Avenue Hackensack, New Jersey 07601 551-996-2000
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Appendix E

HMH IRB Approval for Amendment 3

Ihde, Erin

From: eResearch@HackensackMeridian.org
Sent: Tuesday, January 14, 2020 10:34 AM
To: Ihde, Erin
Subject: eResearch: Amendment Approved



Hackensack
Meridian *Health*

Amendment approved

ID: [Ame3_Pro2019-0015](#)

Title: Amendment 3 for IRB Study #Pro2019-0015

Description: Your amendment has been approved. To navigate to the project workspace, click on the above ID.

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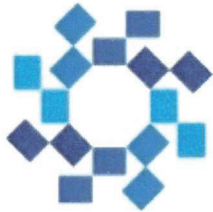
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Appendix F

HMH IRB Approval for Amendment 4

Ihde, Erin

From: eResearch@HackensackMeridian.org
Sent: Thursday, February 20, 2020 2:09 PM
To: Ihde, Erin
Subject: eResearch: Amendment Approved



Hackensack
Meridian *Health*

Amendment approved

ID: [Ame4_Pro2019-0015](#)
Title: Amendment 4 for IRB Study #Pro2019-0015
Description: Your amendment has been approved. To navigate to the project workspace, click on the above ID.

Important news about our email communications.

Hackensack Meridian Health Network has implemented secure messaging services. If you need assistance with retrieving a secure email, please send an e-mail to postmaster@hackensackmeridian.org

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Appendix G

Recruitment Site Permission Letter



March 1, 2019

Erin Ihde, MA, CCRP

Ph.D. Student, Seton Hall University

School of Medical and Health Sciences

Research Project Manager

The Deirdre Imus Environmental Health Center®

Hackensack University Medical Center

Dear Erin Ihde:

As the Parent Outreach Facilitator at Hackensack High School, it is my pleasure to collaborate with you and members of the study team to recruit focus group participants for the research study titled, "Understanding Environmental Health of Latinas in Cleaning Occupations."

I understand this study is being conducted in partial fulfillment of the requirements for your Ph.D. in Health Sciences dissertation at Seton Hall University, School of Medical and Health Sciences, in partnership with Hackensack University Medical Center (HackensackUMC). I understand you may recruit up to six focus groups of 8-10 participants each over the course of the project. Recruitment will be through word of mouth with school parents who attend English as a Second Language (ESL) classes at Hackensack High School. Interested parents will be invited to call you or a member of the study team to learn more about participation in the focus groups. The focus groups will be held at HackensackUMC.

I look forward to supporting your efforts to involve members of our school community in your research study.

Sincerely,

Diana Bermudez

Parent Outreach Coordinator

Hackensack High School

Appendix H

Recruitment Permission Letter for Approved Phone List



HACKENSACK PUBLIC SCHOOLS

191 Second Street, Hackensack, NJ 07601 • 201-646-8000
www.hackensackschools.org

June 17, 2019

Erin Ihde, MA, CCRP
Ph.D. Student, Seton Hall University
School of Medical and Health Sciences
Research Project Manager
The Deirdre Imus Environmental Health Center®
Hackensack University Medical Center

Dear Erin Ihde:

As the Parent Outreach Coordinator at Hackensack High School, it is my pleasure to grant permission to you and Francisco Cartujano, MD to recruit focus group participants for the research study titled, "Knowledge, Attitudes, Behaviors and Environmental Health Needs of Latinas in Cleaning Occupations."

The study participants will be recruited from the ESL classes at Hackensack High School. As the ESL classes have now ended for the school year, to facilitate recruitment at this time, I will reach out to class members for permission to be contacted by phone, either by you (for students who prefer English) or Francisco Cartujano, MD (for students who prefer Spanish). Once I receive their responses, I will then provide an approved phone list so that you and/or Francisco Cartujano, MD may contact potential participants.

Sincerely,

A handwritten signature in black ink, appearing to read "Diana Bermudez", is written over a large, light-colored oval scribble.

Diana Bermudez, MAS
Parent Outreach Facilitator
Hackensack High School

Appendix I

Translation Methods for Study

**Translation Methods for the EHLCO Study:
Focus Group Guide, Survey, Flyer & Eligibility Checklist**

The translation method used for the EHLCO study documents follows the Hackensack Meridian Health (HMH) requirements for bilingual research, and the U.S. Census Bureau's recommendations for translating data collection instruments and supporting materials (Pan & De la Puente, 2005). The Census Bureau guidelines state, "data collection instruments that are translated from a source language into a target language should be *reliable, complete, accurate, and culturally appropriate*" and "should also have *semantic, conceptual, and normative equivalence*" (Pan & De la Puente, 2005, p. 10). This is best accomplished through a process termed a committee approach, not by an isolated individual or through other methods such as back translation (Pan & De la Puente, 2005, p. 4). The Census Bureau recommends that the team include, "at least two translators to perform the actual translation function and review, a subject matter specialist, a person with knowledge of questionnaire design and pretesting, and an adjudicator" (Pan & De la Puente, 2005, p. 10).

Therefore, the focus group guide, survey, recruitment flyer and eligibility checklist were translated by a panel of bilingual, native Spanish speakers using the consensus method. Two people conducted a translation of the documents independently (Dora Ponce and Maria A. Mansfield). The third person (Diana Bermudez) compared the two documents and arrived at the

Erin Ihde
3.28.19

final translation. The subject matter specialist was the study PI. The PI assistant possessed knowledge of questionnaire design and pretesting.

The EHLCO study participant consent form was translated by Hackensack University Medical Center's translation service, per the attached letter of accuracy. Use of this translation service is required, per HMH guidelines, for all patient (signed) forms.

Reference

Pan, Y., De la Puente, M. (2005). Census Bureau guideline for the translation of data collection instruments and supporting materials. United States Census Bureau, *Survey Methodology*, 6, 38. Retrieved from <https://www.census.gov/srd/papers/pdf/rsm2005-06.pdf>

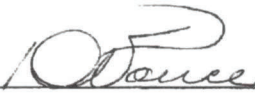

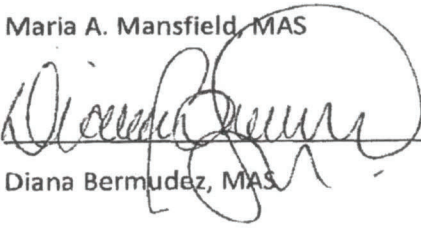
Appendix J

Declaration of Qualified Translator Form for Consensus Method

Declaration of Qualified Translator

Declaration: "I hereby certify that the translation of this document is consistent in content, style, and level of readability with the English documents and the translation is true, accurate, and correct to the best of my knowledge and ability".

Signature of Translators:

 _____	06-06-2019 _____
Dora Ponce	Date
 _____	06-06-2019 _____
Maria A. Mansfield, MAS	Date
 _____	06-06-2019 _____
Diana Bermudez, MAS	Date

Dora Ponce. Qualifications: Dora Ponce was born and raised in Mexico and is fluent with the ability to read, write, and speak Spanish and English. Dora Ponce has helped develop and review linguistically and culturally appropriate materials in Spanish and English.

María A. Mansfield, MAS. Qualifications: Maria A. Mansfield was born and raised in Ecuador and is fluent with the ability to read, write, and speak Spanish and English. Maria A. Mansfield has helped develop and review linguistically and culturally appropriate materials in Spanish and English.

Diana Bermudez, MAS. Qualifications: Diana Bermudez was born and raised in Ecuador and is fluent with the ability to read, write, and speak Spanish and English. Diana Bermudez has helped develop and review linguistically and culturally appropriate materials in Spanish and English.

Appendix K

Translation Certification for Consent Form



62 Brunswick Woods Drive
East Brunswick, NJ 08816-7077
Phone: (732) 613-4554
Fax: (732) 238-7659
tlc@thelanguagectr.com
www.thelanguagectr.com

April 22, 2019

CERTIFICATION

The Language Center hereby certifies that the Spanish translation provided for Hackensack University Medical Center for the job outlined below is a true and accurate representation of the English version provided to the best of our ability and knowledge.

A handwritten signature in blue ink that reads "Mary M. Majkowski".

Mary Majkowski
Director

TLC Job #1904-043

File name: EHLCO consent_4 8 19-E.lhde_Spanish

English into Spanish

Requested by Elizabeth Simunovich

Files sent: 4/22/19

Appendix L

Translation Certifications for Focus Groups 1-3



62 Brunswick Woods Drive
East Brunswick, NJ 08816-7077
Phone: (732) 613-4554
Fax: (732) 238-7659
tlc@thelanguagectr.com
www.thelanguagectr.com

February 12, 2020

CERTIFICATION

The Language Center hereby certifies that the English translation provided for Hackensack University Medical Center for the job outlined below is a true and accurate representation of the Spanish version provided to the best of our ability and knowledge.

A handwritten signature in cursive script, appearing to read "Mary M. Majkowski".

Mary Majkowski
Director

TLC Job #2001-043

File name:

Focus Group #1_EHLCO Study_7.2019 and Focus Group #2_EHLCO Study_11.2019 (English translation)

Spanish into English

Requested by Elizabeth Simunovich

Files sent: 2/12/2020

March 13, 2020

CERTIFICATION

The Language Center hereby certifies that the English translation provided for Hackensack Meridian Health for the job outlined below is a true and accurate representation of the Spanish version provided to the best of our ability and knowledge.



Mary Majkowski
VP, Director

TLC Job # 2002-054

File name: Focus Group #3_EHLCO Study_2.20.20 (English translation)_SP-EN Final

Spanish into English

Requested by Elizabeth Lind

Files sent: 3/13/2020

Appendix M1

Eligibility Checklist (English)

**Knowledge, Attitudes, Behaviors and Environmental Health Needs of Latinas
in Cleaning Occupations**

Thanks for your interest in participating in this study. Please complete the following so we can see if the study is a good fit for you.

Study Eligibility		
Questions	Eligible	Ineligible
Are you a Latina woman?	() YES	() NO
Are you 18 years or older?	() YES	() NO
Do you work in any type of cleaning services?	() YES	() NO
Are you willing to participate in a group discussion to explore the participation of Latinas in the cleaning industry?	() YES	() NO

Contact information of ELIGIBLE participant			
First Name			
Last Name			
Phone Number	Ok to leave voice messages?	Best time to call	
Cell ()	() Yes () No		

Preferred Language(s) for Focus Group
() Spanish
() English

Preferred Day(s) of the Week for Focus Group. Select all that apply
() Monday
() Tuesday
() Wednesday
() Thursday
() Friday
() Saturday

What is the best time to meet? _____

Appendix M2

Eligibility Checklist (Spanish)

**Knowledge, Attitudes, Behaviors and Environmental Health Needs of Latinas
in Cleaning Occupations**

Gracias por su interés en participar en este estudio. Por favor complete lo siguiente para que podamos ver si el estudio es adecuado para usted.

Elegibilidad		
Preguntas	Elegible	No Elegible
¿Es usted una mujer Latina?	() Sí	() No
¿Tiene 18 años de edad o más?	() Sí	() No
¿Trabaja en algún tipo de servicio de limpieza?	() Sí	() No
¿Está dispuesta a participar en una discusión grupal para explorar la participación de Latinas en la industria de limpieza?	() Sí	() No

Información de contacto de participante ELEGIBLE		
Nombre		
Apellido		
Número Telefónico	¿Podemos dejarle mensajes de voz?	¿Mejor hora para llamar?
Celular ()	() Yes () No	

Idioma(s) Preferido(s) para el Grupo Focal
() Español
() Inglés

Día(s) preferido(s) de la semana para el Grupo Focal. Seleccione todos los que apliquen.
() Lunes
() Martes
() Miércoles
() Jueves
() Viernes
() Sábado

¿Cuál es la mejor hora para reunirse? _____

Appendix N

Alignment Chart for RQ, FG Questions & SCT Constructs

Knowledge, Attitudes, Behaviors and Environmental Health Needs of Latinas in Cleaning Occupations

Alignment Chart for Research Questions, Focus Group Guide Questions and Social Cognitive Theory Constructs

Research Question	Corresponding Focus Group Question	Corresponding Construct in SCT
RQ1: What is the knowledge base specific to cleaning procedures (via <i>training experiences</i>) of a bicultural population of Latina women from different countries of origin and acculturation levels?	#2, 3, 14, 15	- Observational learning (modeling) - Reinforcements
RQ2: What are the <i>attitudes</i> regarding the presence of chemicals in cleaning products a bicultural population of Latina women from different countries of origin and acculturation levels?	#7, 8, 19, 20,	- Expectations - Self-efficacy
RQ3: What are the <i>cleaning routines</i> of a bicultural population of Latina women from different countries of origin and acculturation levels?	#1, 13,	- Behavioral capability - Reinforcements
RQ4: What are the environmental health <i>needs</i> of a bicultural population of Latina women from different countries of origin and acculturation levels?	#9, 10, 11, 12, 21, 22, 23, 24	- Reciprocal determinism
RQ 5: What are the <i>cleaning products used by</i> a bicultural population of Latina women from different countries of origin and acculturation levels?	#4, 5, 6, 16, 17, 18	- Behavioral capability - Reinforcements

Appendix O

Alignment Chart for RQ, Survey Questions & SCT Constructs

Knowledge, Attitudes, Behaviors and Environmental Health Needs of Latinas in Cleaning Occupations

Alignment Chart for Research Questions, Survey Questions and Social Cognitive Theory Constructs

Note: Questions #1-16 are social/demographic questions (not included below).

Questions #17-20 focus on participants' current health (RQ#4)

Questions #21-38 focus on participants' cleaning routine at work

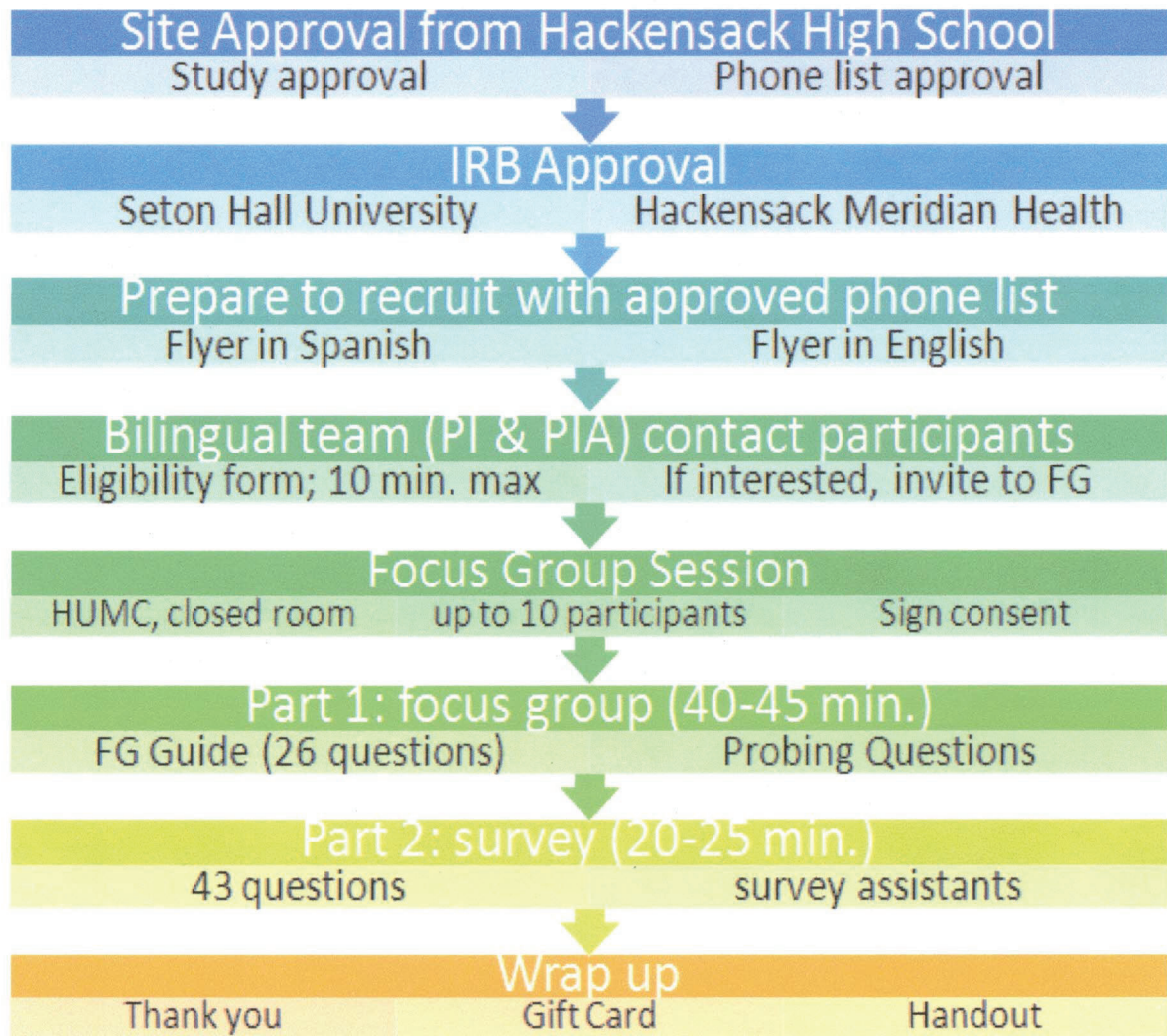
Questions #39-43 focus on participants' cleaning routine at home

Research Question	Corresponding Survey Question	Corresponding Construct in SCT
RQ1: What is the knowledge base specific to cleaning procedures (via <i>training experiences</i>) of a bicultural population of Latina women from different countries of origin and acculturation levels?	#24, 38	- Observational learning (modeling) - Reinforcements
RQ2: What are the <i>attitudes</i> regarding the presence of chemicals in cleaning products a bicultural population of Latina women from different countries of origin and acculturation levels?	(covered in Focus Group questions)	- Expectations - Self-efficacy
RQ3: What are the <i>cleaning routines</i> of a bicultural population of Latina women from different countries of origin and acculturation levels?	#21, 22, 23, 25, 26, 27, 29, 31, 32, 33, 34, 37, 39, 41, 42, 43	- Behavioral capability - Reinforcements
RQ4: What are the environmental <i>health needs</i> of a bicultural population of Latina women from different countries of origin and acculturation levels?	# 17, 18, 19, 20, 34, 35, 36	- Reciprocal determinism
RQ 5: What are the <i>cleaning products used</i> by a bicultural population of Latina women from different countries of origin and acculturation levels?	#28, 29, 30, 40, 41	- Behavioral capability - Reinforcements

Appendix P

Study Procedures Chart

Study Procedures Chart



Appendix Q1

DHHS/NIOSH Cleaning Chemicals and Your Health - Flyer (English)

Protect Yourself:

Cleaning Chemicals and Your Health

Working with cleaning chemicals can cause:

- Coughing
- Wheezing
- Red, Itchy Eyes
- Skin Rashes
- Skin and Eye Burns
- Shortness of Breath
- Sore Throat
- Headaches or Dizziness
- Nosebleeds
- Asthma

If you have health problems that you think are caused by using cleaning chemicals, tell your supervisor and ask to see a doctor.



What You Need to Know

Do not mix cleaning products that contain bleach and ammonia. Dangerous gases can be released and can cause severe lung damage.

Your employer is required to provide a safe workplace that includes:

- Sufficient ventilation (airflow) when using cleaning chemicals.
- Protective clothing, gloves, and safety goggles, when needed.
- Labels on containers of cleaning chemicals.
- Training on the hazards of cleaning chemicals you are using and safe work practices.

Your employer must train you to:

- Know the hazards of cleaning chemicals BEFORE using them.
- Know how to use and store cleaning chemicals safely.
- Know how and when to dilute cleaning chemicals you are using.
- Know what to do if there is a spill or other emergency.
- Know how to obtain and use hazard information on labels and material safety data sheets (MSDS).
- Know how and when to use protective clothing, gloves, and safety goggles.

Remember

- Wash your hands after using cleaning chemicals and before eating, drinking, or smoking.

Green Cleaners

What are they?

- Cleaning products certified by independent organizations as safer to use and less harmful to your health and the environment.
- Cleaners with "green" in their name do not mean it has been certified.

Are Green Cleaners Effective at Cleaning?

- Many have met performance standards for its intended use.
- Also, many green cleaners are "fragrance-free" but still clean effectively. "Clean" does not have an odor!

Safety Reminder

- You may need to use protective clothing, gloves or safety goggles with some certified green cleaners. Ask your employer.

This guidance document is not an OSHA standard or regulation but it contains recommendations that are advisory in nature and intended to assist employers and workers in providing a safe and healthful workplace. The mention of any nongovernmental organization in this document does not constitute an endorsement by NIOSH or OSHA of that organization, its products or services.



Appendix Q2

DHHS/NIOSH Cleaning Chemicals and Your Health - Flyer (Spanish)

Protéjase:

Los productos químicos de limpieza y su salud

Trabajar con productos químicos de limpieza puede causar:

- Tos
- Sibilancias
- Asma
- Sarpullidos en la piel
- Quemaduras en la piel y los ojos
- Falta de aire / falta de aliento
- Dolor de garganta
- Dolores de cabeza o mareos
- Sangrado por la nariz
- Enrojecimiento y picazón en los ojos

Si usted tiene problemas de salud y cree que son causados por usar productos químicos de limpieza, dígame a su supervisor y pida ver a un médico.



Lo que debe saber

No mezcle productos de limpieza que contengan cloro/lejía y amoníaco. Esta mezcla puede liberar gases peligrosos y causar daños graves a los pulmones.

Su empleador debe brindar un lugar de trabajo seguro que incluya:

- Ventilación adecuada (flujo de aire) al usar productos químicos de limpieza.
- Ropa de protección, guantes y gafas de seguridad para su protección, si son necesarios.
- Etiquetas en los recipientes que contengan productos químicos de limpieza.
- Capacitación sobre los riesgos de los productos químicos de limpieza que usted usa y las prácticas de trabajo seguras.

Su empleador lo debe capacitar para:

- Saber cuáles son los riesgos de los productos químicos de limpieza ANTES de empezar a utilizarlos.
- Saber cómo usar y almacenar en forma segura los productos químicos de limpieza.
- Saber cómo y cuándo diluir los productos químicos de limpieza que usa.
- Saber qué hacer si ocurre algún derrame u otra emergencia.
- Saber cómo y cuándo usar ropa de protección, guantes y gafas de seguridad para su protección.
- Saber cómo obtener y usar la información de peligros en las etiquetas y hojas de datos de seguridad de los materiales (MSDS).

Recuerde

- Lávese las manos después de usar productos químicos de limpieza y antes de comer, beber o fumar.

Productos de limpieza ecológicos

¿Qué son?

- Son los productos de limpieza certificados por organizaciones independientes como más seguros de usar y menos perjudiciales para su salud y el medio ambiente.
- No todos los limpiadores que dicen "ecológicos" o "green" en sus nombres han sido certificados.

¿Los productos de limpieza ecológicos limpian eficazmente?

- Muchos han cumplido con los estándares de rendimiento para su uso.
- Además, muchos limpiadores ecológicos no tienen fragancia, pero limpian eficazmente. La limpieza no tiene olor!

Consejo de seguridad

- Puede que necesite usar ropa, guantes o gafas de seguridad para su protección al utilizar algunos limpiadores ecológicos certificados. Pregúntele a su empleador.

Este documento guía no constituye una norma o regulación de OSHA, pero contiene recomendaciones que sirven de consejo y de asistencia a empleadores y trabajadores para contar con un lugar de trabajo seguro y saludable. La mención de cualquier organización no gubernamental en este documento no constituye un respaldo de NIOSH u OSHA a esa organización ni a sus productos o servicios.

