Abstract
As of 2019, 36.5 percent of American adults are obese, and 32.5 percent of American adults are overweight. In all, more than two-thirds of adults in the United States are overweight or obese. Multiple studies have shown that within home care, obesity is becoming more and more of a problem due to their lack of mobility. Obesity is directly linked to a decrease in mobility and reduced quality of life. Without proper measures in place, mobility can be a huge contributor to someone’s health. The combination of these findings prove that this population needs special considerations in all aspects of life. Designers can positively impact this condition by creating a space with mobility-focused design. Implementing these elements within home care can greatly increase the health of the individual, and lead to long-lasting positive impacts on the lives of those involved in home care. This study specifically focuses on how mobility can be promoted for people with obesity in home care.

Introduction
In 2014, it was reported that 60% of Americans had at least one chronic condition, and 42% had multiple chronic conditions. Data collected from the president’s council on obesity in America, the obesity epidemic report, and the national center for chronic disease prevention and health promotion found that obesity is a growing problem in the United States. This is due to a combination of factors, including lack of physical activity, poor dietary habits, and overall sedentary lifestyles. The rise in obesity is linked to a decrease in mobility, which in turn can lead to a decrease in quality of life. This study will focus on how mobility can be increased in home care for people with obesity.

Table of Design Considerations
The following design considerations have been gathered through the research presented throughout this paper. They include general considerations broken out into various categories. The foundation laid by these considerations was crucial to developing the toolkit. Some elements from the considerations were used in the toolkit, while some were not deemed crucial. Overall, these considerations provide a starting point for designers, while the toolkit’s aim is to give specific instructions.

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<th>Pathways</th>
<th>Accessories/Use case considerations</th>
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<th>Care allowing for mobility</th>
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<td>Accessibility, ease of use Ladder for the bathroom Ladder for the kitchen</td>
<td>Caregiver safety: minimize risk of physical injury</td>
<td>Safety; fall prevention Increased safe in the home Patient satisfaction and comfort</td>
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Layout
- Minimize risk of physical injury
- Efficient delivery of care
- Minimize patient stress
- Minimize under strain during recovery
- Patient satisfaction and comfort
- Layout that promotes safety and mobility as well as proper circulation

Caregiver/Clinical Staff Workspace
- Minimize risk of physical injury
- Efficient delivery of care
- Minimize patient stress
- Minimize under strain during recovery
- Patient satisfaction and comfort
- Layout that promotes safety and mobility as well as proper circulation

Flooring
- Minimize falls/injuries
- Non slip and trip materials

Walls
- Communication/interaction with care provider/emergency care
- Efficient delivery of care
- Patient satisfaction and comfort
- Air quality
- Possible telemedicine exam

Doors
- Fall prevention
- Psychosocial support
- Quick access
- Privacy

HVC
- Efficient delivery of care
- Patient satisfaction and comfort
- Fan and air circulation
- Reduced medication errors

Lighting
- Possible telemedicine support
- Efficient delivery of care
- Patient satisfaction and comfort
- Fall prevention
- Reduced medication errors

Fixtures/Furnishings/Appiances/Equipment/Accessories
- Minimize risk of physical injury for patient and caregiver
- Reduce under strain during recovery
- Patient satisfaction and comfort

Case Management/Storage
- Medical safety
- Efficient delivery of care

Patient Handling/Movement Equipment
- Minimize risk of physical injury for patient and caregiver
- Fall prevention
- Efficient delivery of care

Technology/Equipment/Internet
- Minimize risk of injury to patient
- More communication/interaction with care giver/emergency care
- Minimize patient stress
- Must provide more patient control and independence

Methods
1. The methods utilized to determine the conclusions of this paper include searching literature databases such as Google Scholar, EBSCO, and JSTOR. Key search terms that were used include: mobility, mobility in home care, home care design, safety in home care, psychological impacts in home care, and circadian lighting.
2. A toolkit was created to serve as guidelines and recommendations for future designers to use in home care.
3. A proof-of-concept floor plan was designed to demonstrate the effectiveness of the toolkit.

Gaps in the Research
1. Home care is unregulated
2. There are no base models on how home care should be designed
3. Caregivers are unable to properly respond to situations due to lack of standardization

Research Question
What design features should be implemented into home care for promotion of mobility for people with obesity?

The Future of Home Health Care: A Strategic Framework for Optimizing Value

References


Research on home health care management & practice, 2016-2017


PROMOTING MOBILITY IN HOME CARE FOR OBESITY

Alina Lim | Spring 2021 | Dr. Parkinson

**Toolkit**

This toolkit was created to serve as guidelines and recommendations for future designers to use in home care. Elements of this guide can be utilized to optimize the design to better serve the needs of patients. The process of developing this toolkit began with the creation of the design considerations table. This table provided the foundation of research which grew to become the toolkit. It became very clear that there were at least three major categories of considerations that are essential to designing a space for someone suffering from obesity. The three categories are: mobility, safety, and psychology. Mobility refers to the design that promotes physical activity as well as mobility. Through the research conducted around this population, designing for mobility is crucial in establishing a healthy environment. Safety aims to provide design modifications to promote patient and caregiver safety. Dispensing care in a home care setting can be an incredibly difficult and sometimes dangerous job. Designers should take special care in implementing safety features that can protect the resident of the space and the caretaker. Creating a safe area for all parties will ensure that the resident will thrive in their home. Lastly, psychology refers to a design that promotes socialization and mobility to minimize psychological impacts. When mobility is compromised, the patient's psychological state can deteriorate. A deteriorated mental state can start to cause deterioration in one's physical and emotional health as well. Ensuring that one designs for sociability as well as mobility will increase the health of the resident. The three categories and the specific elements within them provide a reference guide for designers when designing for home care for those suffering from obesity.

**Design Element**  
**Category**  
**Design Strategy**  

**Lighting (Natural & Artificial)**  
**Mobility**  
- Well lit and adaptable lighting can reduce falls and injuries for patient and caregivers  
- Natural lighting can reduce discomfort and improve general health  
- Avoid blue light when sleeping (disturbs circadian rhythm)  
- Circadian lighting - works with the body's natural internal clock  
- Ex: lights gently turning on and in increasing brightness to wake the patient up. Lighting would gradually get brighter throughout the day, following the sun's natural pattern. At night, the lights will slowly dim as the sun sets to promote the patient to sleep at regular hours (Hudgren et al., 2015)  
- Previously implemented into workspaces and healthcare settings to increase productivity and mobility  
- Increased views to windows to encourage mobility  

**Noise**  
**Mobility**  
- Reduce exterior and internal noise in the home when patient is sleeping  
- Unnecessary noise can have a negative effect on patients sleep which can affect their mobility throughout the day  
- Soundproofing (weather-stripping)  
- Strategically placed furniture can soften external noise  
- Curtains and plants can deflect and reduce noise  

**Color**  
**Psychology, Mobility & Safety**  
- Implement contrasting colors to distinguish floor from walls  
- Use contrasting colors for toilet seats and furniture to the floor  
- Warm greens can promote mobility and productivity while also reducing stress  
- Small implementation of yellow raises alertness and mobility  
- Use warm shades and avoid cool shades (warm shades can be encouraging while cool shades can appear sobering)  
- These colors are suggestions based off of research done in the home environment. One’s psychological state can also influence what colors should be implemented into the home to promote mobility. It is important to ensure that the color being used fits the user's preference and needs.  

**Flooring**  
**Mobility & Safety**  
- Nonslip flooring  
- Non-slip flooring  
- Hardwood floors: softwood dents easily while hardwood can  
- Ceramic flooring: Best for kitchens and bathroom. Tiled must be 2” x 2” tiles also have more grot size in turn, improves traction on turning patients to showers. Larger tiles are more susceptible to cracks  
- Vinyl flooring: Great for kitchen and bathrooms. Less expensive and good for wheelchairs  
- Remove throw rugs that pose a slipping hazard. If new construction, consider inlay rugs  
- Seamless transitions  
- Avoid carpets unless high-pile  
- Nonslip flooring  

**Walls**  
**Psychology, Mobility & Safety**  
- Avoid slip resistant surfaces. Can be interpreted as a barrier which in turn reduces mobility  
- Color-contrasts on doors and windows  

**Windows**  
**Mobility & Safety**  
- Increase views to windows to encourage mobility  
- Nonslip flooring  
- Under-counter space for leg room  

**Doors**  
**Mobility & Safety**  
- Swing-clear hinges (add an extra 1.5-2” of clearance)  
- Lever style doorknobs  
- Pocket doors in tighter spaces  
- 3” doors  
- Nonslip flooring  

**Bathroom**  
**Mobility & Safety**  
- Ensure knees and hips of patient are at 90 degree when sitting on bed. Allows patient to stand easier  
- Fixtures used for showers and baths  
- Nonslip flooring  
- Nonslip flooring  

**Furniture**  
**Mobility & Safety**  
- Implement designated storage for caregivers to have easy access to medication  
- Open lower cabinets in kitchen and inpatient shelves that pull out and raise  

**Space Planning/ Pathways**  
**Mobility**  
- Implement opportunities for mobility through an open plan and hallways  
- 5 turn radius  
- Must place mudroom or garage on opposite side of house from master bedroom to increase encourge mobility  
- Consider adding wheelchair ramps (permanent or portable)  
- Layout with proper circulation  

**Storage/ Organization**  
**Mobility & Safety**  
- Implement designated storage for caregivers to have easy access to medication  
- Low open cabinets in kitchen and inpatient shelves that pull out and raise  

**Furniture**  
**Mobility & Safety**  
- Avoid furniture that is difficult to move for the caregiver. When mobility impairments are willing to use an assistive device  
- Implement chair with sturdy legs specific for chair exercises to elevate heart rate and practice functional movements  

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### Conclusion

Obesity is one of the costliest chronic conditions affecting the world. This fact alone demands research targeted at this population to ensure that they receive the proper care. The research discussed within this literature review have made a great deal of progress regarding obesity within the home care setting. However, there is not a unified set of standards designed to protect this population and ensure that their care is adequate. I have proposed the creation of a toolkit that lists 13 points of consideration for designers to guide them in creating a home care space for an obese population. To begin, lighting should aid in the efficient delivery of care and should be considered when attempting to improve patient satisfaction. Management of noise should be considered to aid healthy sleep patterns. Contrasting colors should be considered to distinguish between floors and walls. Designers should utilize non-slip flooring to minimize falls. Walls must use simple patterns to aid in efficient mobility within the space. Windows should be utilized to encourage activity. Doors that aid in fall and injury prevention must be considered. The height of the bed in the bedroom must allow the patient to sit at a 90-degree angle. The bathroom should include elements such as grab bars, sit to stand, and walk in showers. Fixtures such as raised electrical outlets and strategically placed alernt should work to reduce the risk of injury for the patient from all sources. Pathways should optimize mobility through the creation of an open layout. Effective storage solutions should be implemented for safety and efficiency of care. Finally, in terms considerations such as avoiding low height furniture, and utilizing higher weight capacity materials will aid in providing a safe environment. The previous considerations, and the specific detailed recommendations included within the toolkit, work together to create a comprehensive standard for home care targeted for those suffering from obesity.

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### References