What is the Value of Home Safety Assessments?

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Abstract

Home safety assessments (HSAs) improve occupational therapy clients' safety within their individual homes. However, a lack of available staffing and funding to conduct these assessments exists. This study explores the return on investment for home safety assessments completion. Currently, occupational therapy students get little to no training about what a home safety assessment is, how to complete one, or how to advocate for a client to receive one if the subject is not built into their curriculum. This study will justify the continuation of home safety assessments provided as part of University of Missouri's Occupational Therapy (MUOT's) pro bono clinic. Additionally, the research will be used to update educational materials utilized by MUOT to improve health professional students' didactic learning and experiential lab components.

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What is the Value of Home Safety Assessments?

Working with the MUOT department, I proposed to determine the cost effectiveness of Home Safety Assessments (HSAs) through education, research, and advocacy. I determined cost effectiveness by working with a local economist to calculate the cost of a HSA completed by an OT in clinical practice, determined benefits to clients that receive a HSA, advocated for education of HSAs to be a continued effort in MUOT course curriculum, and developed interactive educational HSA modules for future educational use. Image examples of modules are located in Appendix A.

Needs Assessment

I examined the positives of both quality and cost effectiveness of HSAs to occupational therapy clients. In the past, MUOT students were completing HSAs through the adult pro bono clinic on the University of Missouri's campus. MUOT faculty were supervising HSAs as experiential learning opportunities for their OTD students.

HSAs align with both the values and mission statement of the MUOT department. MUOT's mission and vision are as follows: to improve the health and well-being of society by assisting people to optimize their participation in everyday life occupations and that the Department of Occupational Therapy at the University of Missouri will be a globally renowned leader in occupational therapy exemplified by innovation and excellence in clinical education, service, practice and scholarship (University of Missouri, n.d.).

However, providing students with the HSA experiences is costly. Specifically, funding for a faculty member to accompany students to clients' homes and liability insurance to conduct these assessments is reviewed annually. Presently, the MUOT department receives referrals for HSAs from community providers. Referrals to the MUOT pro bono clinic are received from

facilities within the community that do not have the staff or funding to complete HSAs. Additionally, MUOT's clinic serves many clients that have run out of insurance or are uninsured whom for-profit entities will not serve for lack of reimbursement.

For my DCE project, I aimed to determine the costs versus benefits of a HSA being completed by an OT, advocate for the continuation of funding of a MUOT department faculty member, an adjunct professor, or a community OT, to assume the role of taking students on HSAs as an experiential learning opportunity, and to explore organizations within the mid-Missouri community that may partner with MUOT to complete HSAs.

Literature Review

A home safety assessment is a thorough assessment of the inside and outer area of a client's home to identify any potential hazards to the client; the goal is to create a safer environment using environmental modifications and adaptations that prevent potential harm. Home safety assessments serve people throughout the lifespan with a myriad of illnesses, diseases, conditions, and injuries. Falls and subsequent injuries are common reasons for referrals for a home safety assessment. Clark (2023) states that a home safety assessment involves a skilled home care professional carefully examining your living environment, covering various aspects such as the home's structure, entry and exit points, emergency equipment, fire hazards, electrical safety, and fall risks. Once problem areas are identified, the evaluator will offer recommendations to address these issues.

Falls are the most common safety hazard, most commonly occurring in the home, and are one of the most preventable accidents. By preventing falls, it is estimated that Medicare can be saved between $94 million-$442 million (Stevens & Lee, 2018). Following a fall, a patient may need hospitalization and resulting surgery. A hip replacement surgery in the U.S. ranges from

$30k-$112k (AAHKS Hip and Knee Care, 2023). Then, after a patient is discharged from their hospital stay, there is an increased chance that they fall again within the next 12 months. A study by Hill et al. (2021) found that 67 of 160 participants (42%) fell 140 times within the following 12 months after discharge from the hospital. Of these, 99 resulted in an additional injury or fracture. Newgard et al. (2021) explored the cost of falls in older adults requiring emergency medical services. They found that 1,045 out of 2,494 (41.9%) were admitted to the emergency department with a severe fracture to the extremity (18.1%) with orthopedic surgery being the most common procedure (15.6%) (2021). Therefore, a significant percentage of patients are likely to fall, needing readmission and additional hospital stays.

Readmissions to the hospital have significant negative effects on both patients and hospital systems. For patients and their families, readmissions are stressful and costly, leading to physical and emotional strain. Frequent readmissions can indicate poor care coordination or inadequate discharge planning, though later readmissions often result from the patient's underlying health issues. For hospitals, high readmission rates damage their reputation, reduce profitability, and contribute to overcrowding. Hospitals are required to report readmissions, affecting their public image and potentially reducing patient volume. They also face financial penalties from the CMS Readmission Reduction Program, which can cut payments by up to 3% for each readmission. Additionally, increased readmissions lead to overcrowding, putting extra pressure on healthcare staff (GrandCare Health, n.d.).

Falls cost thousands of dollars; however, are home safety assessments a cost-effective intervention to reduce falls? Pega et al. (2016) looked at the impact of home safety assessments on older adults in New Zealand. Findings indicate that “intervention (home safety assessments) produces considerable health gain and is highly cost-effective among older people in the high-

income country setting of New Zealand. Targeting [home safety assessments] to older people with previous injurious falls reduces upfront intervention and incremental health system costs, as well as improves the cost-effectiveness" (Pega et al., 2016, p.3). Therefore, completion of home safety assessments could be viewed as a justified upfront cost to prevent falls and subsequent higher costs of a hospital stay later.

Home safety assessments are within the scope of practice for occupational therapists (OTs) and home safety assessments are commonly completed by OTs (Clark, 2023). OTs bring unique skills to the focus of prevention of future injury. However, insurance does not commonly cover home safety assessments from a preventative standpoint, but rather in response to a fall or injury in the home. Furthermore, clients must be referred for home safety assessments by a physician or medical provider (Clark, 2023); yet it is not guaranteed that physicians know about home safety assessments or that home safety assessments are within the role of an OT. A study by Atkinson et al. (2013) looked at how incorporation of a geriatric rotation, similar to a fieldwork or practicum rotation, impacted medical students' knowledge and confidence in regard to the geriatric population. During the rotation, all students were required to complete a home safety assessment. At the end of the study, researchers concluded that the inclusion of a home safety assessments in a geriatric rotation were effective in "gaining knowledge" (Atkinson et al., 2013).

In conclusion, by completing HSAs, the rate of in-home falls and subsequent injuries will potentially decrease. If the frequency of in-home falls decreased following completion of HSAs, the result would be decreased healthcare spending. The benefits of increasing the frequency of HSAs being completed will result in an increased quality of life, function, and safety for clients. Furthermore, by decreasing the risk of falls in a home via completion of HSAs, the clients

benefit from decreased healthcare expenditures. Additionally, educating health professional students results in increased awareness of what a HSA consists of and who is skilled to complete them, thereby, increasing the likelihood of HSA referrals.

Methods

Research Design

This is a multi-aspect quality improvement study. I aim to determine the cost effectiveness of HSAs and identify current HSA practices in the Mid-Missouri area. Data from the study will inform development of educational materials to improve students' HSA knowledge, support OT's role within home safety, and examine past HSA recipients survey responses to determine effectiveness of HSA recommendations. Outcome data will be utilized to demonstrate financial and qualitative incentives to MUOT to continue HSA practices as an experiential learning opportunity for students.

Participants and Recruitment

This study was determined to not need IRB approval. Individuals that have been seen by MUOT students to receive a HSA and completed a quality improvement survey following the home visit will be included in the study. Data from these surveys will be gathered and analyzed retroactively. No Primary Health Information, or PHI, was collected at the time of survey administration or will be reported during this study. No consent is collected since all clients that receive a home safety assessment from the MUOT department have previously consented to the collection of data in their home and have given access to their residence.

Retired economist, Dr. Dennis DiPietre, was consulted to calculate financial costs versus the costs MUOT for the completion of a HSA.

Measures

This study is a quality improvement study, designed to identify the outcomes of a home safety assessment for community and clients while exploring the barriers to completing the assessment. Comparison of the cost of a fall and readmission and the cost of a home safety assessment will be completed through means of a partial budget calculation.

The educational materials created for future OT students will be completed with use of PowerPoint slides with embedded opportunities for reflection and discussion. Materials will be determined to be appropriate via approval of faculty of the MUOT department upon project dissemination.

Outcomes

Examining All Costs Associated With An HSA

Following consultation with economist Dr. Dennis DiPietre it was determined that if a group of students and faculty provided HSAs to community members that the healthcare system would save on average of $1756.44 compared to the cost of $445.40 that MUOT bears for every 4 HSAs when falls result in an intertrochanteric fracture based on data from Adeyemi and Delhougne (2019). See Table 1 for more information. Costs of MUOT were determined based on travel time, liability insurance, average OT salary based on the American Occupational Therapy Association 2023 Workforce and Compensation Survey, overhead costs, and time to complete HSA and following recommendations. See Table 2 for more information.

Table 1

Costs Associated with a Fall

	Costs	Costs that Decrease	Amount
4/100 falls eliminated	4%	Cost of a fall	

	$15,172	Inpatient cost per broken hip	$606.88
	$377	Outpatient visits	$15.08
	$4,311	Physicians	$172.44
	$44	Durable Medical Equipment	$1.76
	$18,480	Skilled Nursing Facilities	$739.20
	$1,302	Home Health	$52.08
	$4,414	Rehab Hospital Stay	$176.56
	$36	Hospice	$1.44
Total			$1,765.44

Table 2

Cost of Completing a Home Safety Assessment

Unit	Unit Cost	Costs	Amount
1.5	$47	Travel Time for an OT for a total of 1.5hr	$70.50
70	$0.66	Mileage Reimbursement	$45.85
8	$0.30	Liability Insurance/hr	$2.40
2	$47	OT salary 2 hrs on-site	$94

30%	$47	Overhead costs (FICA, Retirement, etc.) @ 30% salary	$91.65
4	$23.50	Recommendation Creation (1/2 time student rate)	$94
1	$47	OT professional reviews recommendation	$47
Total			$445.40

Client Post-HSA Survey Results

Following a HSA conducted by students of MUOT, clients receive a call to complete a voluntary 5-minute phone survey. Survey includes questions regarding client's increase of knowledge, clarity of modification recommendations, OT students' professionalism, if the client has made any recommended changes/modifications, etc. A full list of HSA Survey questions is included in Appendix B.

Upon examining the responses of 12 surveys that were 100% completed, it was concluded that 10 responded that the HSA was "helpful" or "very helpful" (83%). 11 of the 12 (91%) reported "a lot" of knowledge following the HSA and being "satisfied" or "very satisfied" with the assessment. 9 of the 12 (75%) reported ease of understanding as a rating of 4 or 5 out of 5. 7/12 (58%) had reported using recommendations at time of survey completing and 2 reported future plans to implement recommendations. 11 out of 12 (91%) reported MUOT student as being respectful during time of HSA completion and 10/12 (83%) clients reported that they would recommend MUOT HSA services to a friend or family member.

Discussion

During the time of completion for this study, there were many barriers to the completion of this study. An expansion on each of the barriers is provided below.

Money

The University of Missouri's Department of Occupational Therapy lost its funding to conduct HSAs on June 1, 2024. Funding for MUOT's HSAs came from University of Missouri's HealthCare System's CARTS funding that is determined to be allocated by a select group of people that are not within MUOT nor do they see the impact of HSAs. The result of funding being reallocated was me being prevented from continuing to gather qualitative data regarding new client experiences. Therefore, the end goal of this study was shifted from supporting continuation of to the re-establishment of HSA practices within the department to provide experiential learning opportunities to future OT students.

People and Time

A lack of organizations that offer HSA services in the Mid-Missouri area was identified during the time of this study. Cold-calling facilities in the Mid-Missouri area yielded a result of 17 organizations that offer HSAs as a service. However, upon further investigation it was found that of those 17 organizations that one organization offers HSAs pro bono (MUOT). The remaining 16 organizations have additional requirements to qualify for their HSA services. Additional requirements may include age, income or SES status, whether a client owns their home, if a client lives with a distance from the organization or within city limits of Columbia, Missouri. Additionally, two facilities have for-pay contracts with MUOT, stating that if MUOT completes the HSA they will be paid an agreed-upon amount that is less than the $445.40 amount

that it costs to complete the HSA. When speaking with organizations that referred clients to MUOT prior to the loss of funding, it was reported that they have since not found another organization to offer the same services.

When MUOT was assuming the responsibility of HSA referral completions, it was up to a professor within the department to accompany a group of OT students to the client's residence and oversee the HSA to ensure professionalism and skill competence. By requiring a professor to accompany said students, this resulted in the professor having to set aside their other responsibilities (i.e., grading assignments, creating lessons, meeting with students or faculty, etc.) and ultimately causing the professor to make-up this time. Upon identifying this stressor in the current MUOT's HSA practices, I sought alternative solutions to relieve this stress from the professor and department. These solutions will be expanded on in the following paragraph.

Education

Due to the barrier of available time to complete HSAs as they are currently structured within MUOT, I have delved into three potential solutions to ensure that HSA information and experiences may remain within the MUOT curricula.

Home for Life Design

An online platform that serves as a HIPPA compliant electronic medical record, Home for Life Design (HFLD), offers a pre-structured format for students to fill out in real-time as they complete a HSA. During a meeting with a HFLD company representative we discussed the population that makes up their current market and evidence-based research that has been conducted to demonstrate that the program is effective at lower risk of falls in the home. HFLD is utilized by multiple OT departments and LLCs across the U.S. and completed outcomes data

that showed a 30% increase in a home's accessibility score following a HSA visit and installation of recommended equipment (Home For Life Design, personal communication, June 17, 2024). Additionally, HFLD has a built-in competency training and quiz that students must pass prior to going on a home visit to ensure competency and interrater reliability. These trainings can be completed outside of class time and due to the students already having passed the competency trainings a professor no longer needs to accompany the groups of students to clients' homes, easing the strain of time. Current annual subscription fees are $250 per professor and $10 per student, making the total cost in an average sized class of 45 students amounting to $700, significantly less than what MUOT was paying to support the HSA services, addressing the barrier of funding.

Asynchronous Online Student Modules

After identifying the barriers of HSAs being completed within MUOT (i.e., time, money, and people) I tasked myself with finding a way to develop curriculum to address the topic without needing to create a new course or add the task of teaching HSAs to a professor's agenda. I created an asynchronous online learning module that follows the formatting of a HSA evaluation and discusses each room of a home. These online modules offer opportunities for critical thinking, hands-on opportunities, multi-media learning, and have built in assignments. When thinking about where the module would fit within current curricula being taught, I sought out the professor in charge of the Assistive Technology (AT) course. After speaking with the professor, it was concluded that this module would fit well within the current course description and would expand nicely on the topic of HSAs that is currently being taught within the AT course without adding additional work for the professor.

A Partnership

Similar to when examining barriers to reinstating HSA experiential learning into MUOT's program, I found that the same barriers existed within the community while completing the calls to Mid-Missouri facilities. Many facilities reported that they had a lack of staff (people) or had a too high productivity requirement (time and funds). To address the barriers at both the MUOT level and community level, a solution I propose is for MUOT to partner with an outside facility. A facility would agree to complete HSAs as part of their practice and allow groups of students to accompany on these home visits to gain the hands-on learning. This would relieve the need for a MUOT faculty member to accompany the students, would potentially increase the number of HSA opportunities for students, provide CEUs to the participating OT, and allow for the facility to bill for the HSA, thereby creating a new revenue stream and addressing a community need.

In summary, HSAs are important preventive care measure that can save a significant amount of money and strain on the healthcare system. Students in the past have had hands on learning experiences but more recently, barriers have occurred making it difficult for MUOT to continue providing this learning opportunity (i.e., time, money, and people). The purpose of this paper was not only to identify these barriers but also offer solutions. The solutions are online platforms such as Home For Life Design, asynchronous educational modules such as the ones I created during my time on this project, and MUOT partnering with community clinicians to increase frequency of HSAs being completed. In summary, it is feasible to continue providing MUOT hands on opportunities for HSAs with the utilization of these new strategies.

Reflection

During the process of this project, I had bias toward the belief that HSAs are a beneficial service. Having conducted HSAs as a student at MUOT, I saw the value in HSAs as a service and was taught that HSAs positively impact OT clients to support their independence in

everyday life. The outcomes of this study support my belief that HSAs when completed as a preventative measure relieve the financial burdens and stressors of time and staff that an incident could incur.

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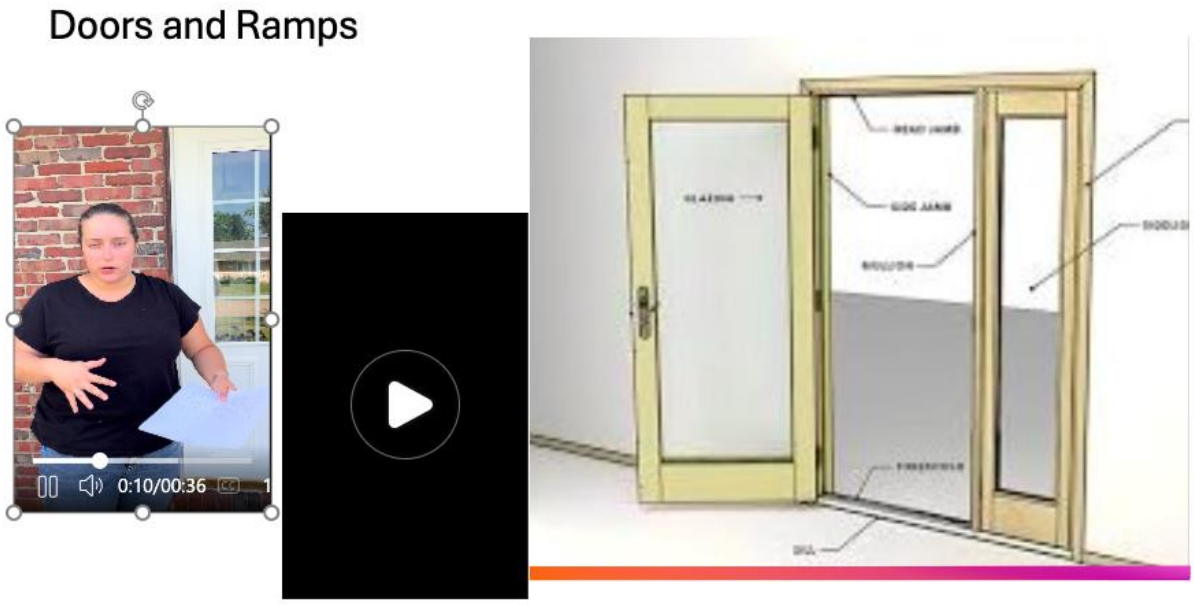
Appendix A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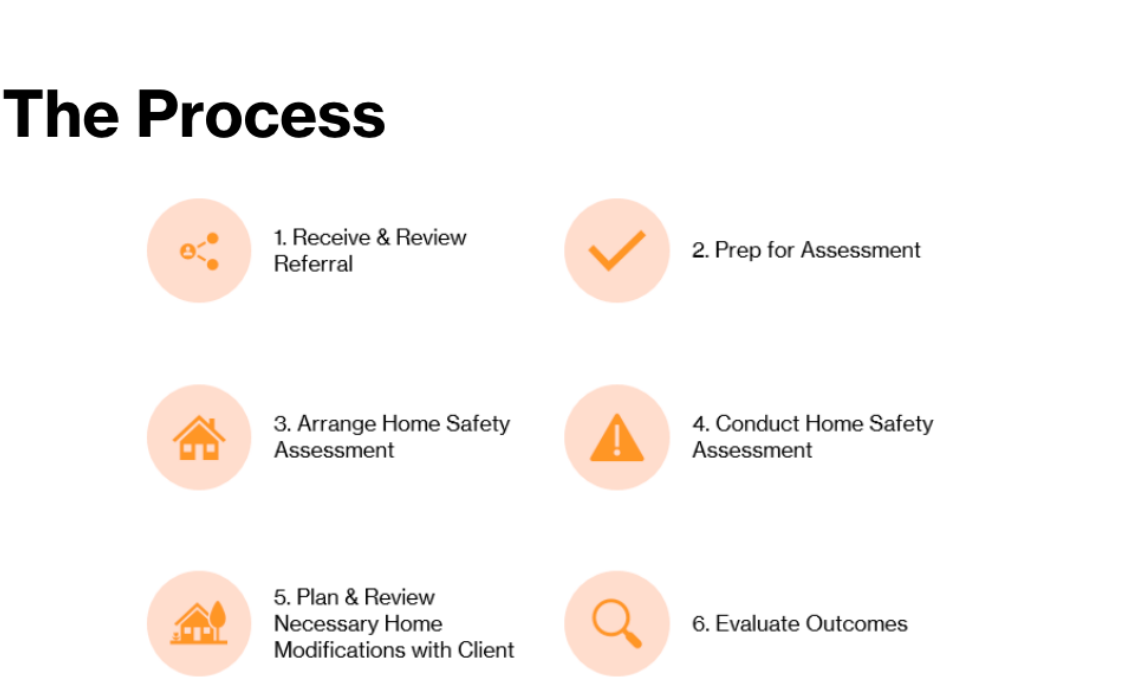
The Process
1. Receive & Review Referral
2. Prep for Assessment
3. Arrange Home Safety Assessment
4. Conduct Home Safety Assessment
5. Plan & Review Necessary Home Modifications with Client
6. Evaluate Outcomes

Appendix B

Home Safety Assessment Satisfaction Survey

Start of Block: Default Question Block

Q1 Hello! My name is ____ and I am a student from the Department of Occupational Therapy at the University of Missouri. Some of my classmates completed a home safety assessment with you or your loved one within the past year, and we would like to get your feedback on your experience. Do you have 5 minutes to answer some quick questions?

If yes, continue to survey to ask each question.

If no, ask if there is a better time to call back.

Q2 Initials of Interviewee

_____

Q3 How did you find out about Tiger OT home safety services?

_____

Q4

	1 (Not Helpful) (1)	2 (Slightly Helpful) (2)	3 (Neutral) (3)	4 (Helpful) (4)	5 (Very Helpful) (5)
How helpful was the home assessment on a scale of 1-5 with 1 being not helpful and 5 being very	○	○	○	○	○

helpful? (1)	

Q5

	1 (Nothing) (1)	2 (A little) (2)	3 (A Lot) (3)
How much did you know about home safety before your home assessment on a scale of 1-3 with 1 being nothing and 3 being a lot? (1)	○	○	○
How much do you know now, following your home safety assessment on a scale of 1-3 with 1 being nothing and 3 being a lot? (2)	○	○	○

Q6

	1 (Not Satisfied) (1)	2 (Slightly Satisfied) (2)	3 (Neutral) (3)	4 (Satisfied) (4)	5 (Very Satisfied) (5)
How satisfied are you with how your problem areas or goals were addressed on a scale of 1-5	○	○	○	○	○

with 1 being not satisfied at all and 5 being very satisfied? (1)	

Q7

	1 (Not Easy) (1)	2 (Slightly Easy) (2)	3 (Neutral) (3)	Click to write Scale Point 4 (4)	Click to write Scale Point 5 (5)
How easy was it to understand the recommenda	○	○	○	○	○

tions from Tiger OT on a scale of 1-3 with 1 being not easy at all and 5 being very easy? (1)	

Q8 Did you have any falls 6 months before Home Safety Assessment?

- Yes (1)
- No (2)

Q9 Did you have any falls since your Home Safety Assessment?

- Yes (1)

- No (2)

Q10 Have you used any of the recommendations?

- Yes (1)
- No (2)

Display This Question:

If Have you used any of the recommendations? = Yes

Q11 Which specific recommendations did you use?

_____

Q12 Were people respectful when they came into your home?

- Yes (1)
- No (2)

Q13 Would you recommend this service to others?

- Yes (1)
- No (2)

Q14 Is there anything else really important that you want to comment on?

_____

Q15 Thank you so much for your time. If you have any further questions, comments, or know of individuals interested in a Home Safety Assessment feel free to reach out to Tiger OT Clinic. Would you like to write down the number? 573-882-3988.

End of Block: Default Question Block