Honors Theses and Capstones   Student Scholarship

Spring 2021

Can Nurses Predict Transitions of Care in Assisted Living?

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Abstract

The older adult population is rising exponentially due to medical advances and the aging of the Baby Boomer Population (Wister, 2005). Many of these older adults are choosing to live in assisted living facilities due to the increased independence and decreased cost of living compared to nursing homes (Grabowski, Stevenson, & Cornell, 2012). Since nurses are the primary directors of care for those in assisted living, the question was asked if they can predict a resident's length of stay based on their knowledge and clinical judgement. A prospective study was performed at an assisted living facility in Oakland, California to determine the accuracy of nurse's predictions. In October of 2019, an eMAR was used to gather data from the residents of the facility and nurse's predictions were recorded. The eMAR was then reviewed again in September of 2020 to determine if the residents still lived at the facility or transferred to another level of care. The data was analyzed using sensitivity and specificity as well as percentage of accuracy of the nurses. 44 out of 64 residents were predicted correctly by the nurses (69% accuracy rate). For the months that were not affected by the Covid-19 pandemic, nurses were 87% accurate. During the peak of Covid-19 (March-May of 2020), nurses were only 50% accurate. It was found that the sensitivity was 70% and specificity was 68%, meaning that nurses were significantly accurate at predicting transitions of care of residents in assisted living facilities, especially during non-pandemic circumstances.

Can Nurses Predict Transitions of Care in Assisted Living?

Background

The aging population in the United States requires supportive care as they age. "The volume and complexity of care needed for the U.S. elderly population has increased the demand for alternative long-term care residential models," (Scan Foundation, 2014). A popular choice for this population has been assisted living facilities (ALF). There was an 18% increase in the number of ALF beds from 2007 to 2010, increasing from 1.05 to 1.2 million beds, while the number of nursing home beds decreased slightly (Han et. al, 2016). A few of the factors that influence the decision to choose ALFs include a lower cost and increased independence compared to nursing homes. However, the average length of stay in assisted living facilities is only 22 months (American Health Care Association). As the aging population increases due to the Baby Boomer generation, ALFs need to be prepared to accommodate the growing number of residents. Given turnover or transitions from ALFs, it is challenging for facilities to know how many people they will be able to accept within the next year. Currently, there is no definitive way to determine whether people will transition out of assisted living during a certain time period. There is minimal literature available on certain predictors of transitions of care and their accuracy. Two identified predictors are gait speed and admission criteria. Peel, Navanathan, and Hubbard (2014) found that "gait speed is an inexpensive, feasible and objective measure of physical performance in frail older people. It could be a useful tool in community-based transition care settings to predict outcomes" (p. 906). Another study found that it is possible to predict a patient's risk of SNF discharge (Oseran, Lage, Jernigan, Metlay, & Shah, 2019). These predictors have not been widely used.

The literature on this topic is missing a key component of predicting transitions of care in ALFs. Nurses are staffed in assisted livings to perform assessments and determine if residents need to transition to a higher level of care. They serve as each client's director of care. Given their ongoing knowledge of clients' needs, a gap in understanding is whether they can predict when residents will need a transition of care based on their assessment. If nurses are performing the assessments of the residents upon admission, can they determine when the resident will transition to a higher level of care? How accurate would nurses' predictions be? This information can assist ALFs in predicting availability for the incoming population and better individualize a resident's plan of care during their stay. This research study investigated how accurate nurses are at predicting transitions of care over a year at an assisted living facility.

Methods and Materials

The data utilized was from a prospective study beginning in October of 2019 through September of 2020. The study data was taken from an assisted living in Oakland, California. All residents were included; there was no exclusion criteria for participation. The participants were selected to be a part of the study as long as they were living at the ALF in October of 2019. All residents at the facility were included to truly determine the accuracy of nurse's predictions of transitions of care for all residents.

The study was conducted utilizing chart review and brief interviews with nurses. The facility electronic medical record (EMR) system was accessed. Data such as the resident's age, race, code status, gender, date of admission, and ambulatory method was collected and entered into a secure database. Code status indicated whether a client had a "do not resuscitate" (DNR) order, a full code, or have not yet discussed with their provider. Ambulatory status determined if the client was independent, used a walker, cane, wheelchair, or scooter. Each client's database

entry also included the nurse's prediction. The nurse was asked, "In one year, would you be

surprised if the resident were still in assisted living?" The yes or no answer was documented in

the spreadsheet. A year later in September of 2020, the eMAR was used again to determine if

the resident was still residing in the AL or if they had transitioned from the facility, passed away,

or left for other reasons. The date they left the facility was also documented if applicable.

These data were then used to determine the accuracy of the nurse's predictions using

sensitivity and specificity. First, the number of true positives, true negatives, false negatives, and

false positives were calculated for the length of the study. Sensitivity was found by dividing the

sum of the true positives and false negatives by the true positives. Specificity was found by

dividing the sum of true negatives and false positives by true negative. Total accuracy of the

nurses were calculated for all months of the study combined (all 11 months) as well as each

individual month's positive prediction success rate.

The total sample size of the study was 64 residents. This number included all residents of

the facility that were willing to let their information be used in the study. The study received

approval from human research protection program at UCSF.

Results

The sample had an average age of 90 years of age (SD=5.9), 80% female (n=64), and

94% white (n=64). 58% had a code status of DNR, 11% were a full code, and 31% did not have

a code status listed

The nurse's predicted 30 residents (46.9%) would have left within the next year. The

actual number of residents that left was 27 (42.2%). Table 1 and 2 show the results of the true

positive, true negative, false negative, and false positive based on nurse predictions and actual

transitions. Therefore, the sensitivity of nurses' predictions, or occurrence of true positive, was

found to be 70%. The specificity of nurses' predictions, or avoidance of false positives, was

68%. These numbers are significant to the main aim of this study.

Table 3 demonstrates a monthly breakdown of predictions. It shows that nurses were

87% accurate for the months November-February and June-September. The months March-May

were only 50% accurate. These months were the beginning months of the COVID-19 pandemic.

These data sets demonstrated that nurses are able to predict transitions of care for AL residents,

especially in non-pandemic circumstances.

Discussion

People in assisted living don't tend to stay in assisted living. Roughly 60% of residents

leave after a median stay of 22 months (Golant, 2004). The purpose of this study was to

determine if nurses can predict when residents transition to higher levels of care. This study

demonstrated that nurses possess the ability to predict transitions of care for assisted living

residents. They are able to direct resident's care by individualizing a care plan based on the

nurse's predictions. The predictions will help nurses guide care and accommodate the needs for

the increasing assisted living population as the baby boomer generation ages.

The COVID-19 pandemic occurred during the study which altered the data completely,

specifically during the peak months of March, April, and May. Nurses were 87% accurate

during all other months and only 50% accurate during the months of March, April, and May.

The unknown effects of the pandemic on assisted living residents were not taken into

consideration at the time of the nurse's predictions. This unforeseen circumstance might have

been a factor that brought down the nurse's accuracy rate. While it was interesting to see how

the pandemic affected the results, the study would need to be repeated in order to get true results

for the main aim of the study.

Some of the strengths of the study were that all residents were included in the study. All the residents' health information data was made available to the researcher at the beginning and end of the study. The study was performed over one year. The demographic data of general ALF matched the demographic data of the specific ALF used. This means the ALF used replicated the actual sample of ALFs around the country. The dates included months in which a pandemic was present which could have presented information not gathered otherwise.

The limitations of this study include that it was only performed at one ALF in Oakland, CA with a smaller sample of 64 residents. The study should be repeated in other ALF across the country of different sizes, price points, and older adult populations. It was only conducted one time, so the study should be repeated for the results to be compared. The study should also be replicated during a non-pandemic time period.

It is unknown how the nurses chose to predict whether the residents would stay or leave, but further inquiry should examine whether there are certain factors the nurses use to determine their answer. Maybe these influencing factors are similar to the literature that is already available such as gait speed and ambulation. The results of that variation of the study might be able to produce an algorithm or flow chart that can help determine whether residents will be in ALF in the next year or transition out.

Nursing Implications

These findings are important for nurses to assist in determining goals and anticipating outcomes for patients in assisted living. If nurses are able to predict when residents will leave, they will be able to better direct their care, which is their role as assisted living facility nurses. It can also help determine resident's preferences and plans for upcoming transitions. If they want to stay in ALF as long as possible, the nurse can use that information to individualize their plan

of care during their admission assessment. This predicting capability of nurses will also allow

ALFs to plan how many available beds they might have for upcoming years and use it to plan for

resources. They might also be able to predict how many residents they will be able to accept for

the upcoming years based on the predictions of the nurses upon assessment.

This study needs to be replicated with many other assisted living facilities of different

sizes/areas/populations in order to compare the results. The study should also be replicated

during a non-pandemic time period. The results of this study were flawed by the Covid-19

pandemic, so a new study must be performed to get accurate results. A variation of the study

should be performed that includes nurse's reasonings behind their predictions to search for

patterns/predictors (gait, health history, age, gender, etc.) that may be able to determine

transitions of care. The results of that variation of the study might be able to produce an

algorithm or flow chart that can help determine whether residents will be in ALF in the next year

or transition out.

Table 1. Categorization table of prediction transition and actual transition

		Transition: Is client in facility after 1 year?	
		Yes	No
Predicted Transition: "In one year, would you be surprised if the resident were still in assisted living?"	**Yes**	True +	False +
	No	False -	True -

Table 2. Data entered in categorization table

		Transition: Is client in facility after 1 year?		
		Yes	No	Total
Predicted Transition: "In one year, would you be surprised if the resident were still in assisted living?"	**Yes**	19	12	31
	No	8	25	33
	Total	27	37	64

Table 3. Nurse accuracy displayed by month

Month	Residents that Left AL	RN Prediction	Prediction Success Rate
November	4	4	100%
December	3	2	67%
January	1	1	100%
February	1	1	100%
March	7	3	43%
April	3	2	67%
May	2	1	50%
June	1	1	100%
July	2	2	100%
August	2	2	100%
September	1	0	0%

References

Data retrieved from American Health Care Association and National Center for Assisted Living

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