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Improving Saint Louis University Mental Status (SLUMS) Exam Adherence

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Practitioner

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Abstract

Problem: Mild Neurocognitive Disorder (MNCD) and dementia remain one of the most common debilitating problems facing the elderly. The Saint Louis University Mental Status (SLUMS) Exam is a screening questionnaire to assess for MNCD or dementia. With the utilization of the SLUMS, clinicians can detect cognitive impairment and provide early intervention resulting in improved function and delayed progression of illness. The aim of this project was to increase the rate of SLUMS completion by at least 75% at a long-term care facility in a rural Midwestern state and to assess changes in diagnoses and treatment plans resulting from use of this screening tool.

Methods: A prospective record review containing quantitative, descriptive data was used for this quality improvement (QI) project evaluating rates of SLUMS completion, changes in diagnoses, and changes in treatment plans resulting from this screening.

Results: Of the 75 residents eligible for SLUMS screening, 41.33% had a diagnosis of dementia or MNCD prior to implementation and 74.67% had one of these diagnoses after screening. Utilizing the SLUMS increased detection of MNCD or dementia by 33.34 %, and 34.7% of residents started on medications to slow the progression of Alzheimer's related dementia.

Discussion: The increase in SLUMS screenings helped to identify early signs of cognitive impairment and establish prompt treatment planning, including medication adjustments. This project identified a clinically significant impact by using SLUMS screening and supports the need to establish annual SLUMS screening to detect cognitive decline at all long-term care facilities in this area.

Improving Saint Louis University Mental Status (SLUMS) Exam Adherence

Dementia currently affects approximately 50 million individuals and estimates predict an increase of 152 million by 2050 (Livingston et al., 2020). By 2050, dementia related costs could rise to over $1.1 trillion compared to just $236 billion in 2016 (Deb et al., 2017). Estimates attributable to caring for those with dementia including informal, formal, medical, and nursing home care cost up to $56,290 annually per person (Zhu et al., 2015). Dementia symptoms include memory loss, issues solving problems, language deficits, and other cognitive skills affecting activities of daily living (ADL) (Livingston et al., 2020). There are numerous types of dementia with about 60%-80% contributed to Alzheimer's Disease (AD). Dementia is a degenerative disease, progresses over time and is irreversible (Alzheimer's Association [AA], 2021).

Mild Neurocognitive Disorder (MNCD)

A diagnosis of MNCD indicates cognitive changes and the early signs of dementia and progressively leads to a decreased quality of life (AA, 2021; American Psychiatric Association [APA], 2013). An accurate diagnosis of MNCD and early detection play a critical role in slowing cognitive decline, and there is an estimated prevalence ranges from 2-10% in ages 65 and older and 5-25% by age 80 (APA, 2013; Knopman & Petersen, 2014). The Diagnostic and Statistical Manual for Mental Disorders-5 (DSM-5) includes a new diagnostic label, "Mild Neurocognitive Disorder" and indicates the diagnosis should be made considering observations of a "modest cognitive decline" from previous level of performance in the areas of attention, executive function, language, social recognition, learning and memory, and perceptual motor (APA, 2013).

Dementia

Alzheimer's Disease (AD) is the most common etiology of MNCD and dementia in persons 65 years or older (AA, 2021). As the population continues to age, there is an ever-increasing prevalence of all types of dementia (Yoelin & Saunders, 2017). There are limited pharmacological treatments available for MNCD and dementia, and those that are available only delay the progression of dementia due to AD having no impact on other types of dementia. There is currently no cure for any type of dementia. The United States (U.S.) Food and Drug Administration (FDA) has approved six medications for AD treatment including: aducanumab, donepezil, galantamine, memantine/donepezil, rivastigmine, and memantine (AA, 2021).

As with MNCD, early detection in dementia is essential to improved outcomes. Lang et al. (2017) examined 23 studies that assessed the rate of undiagnosed dementia cases and found approximately 30,332 out of 43,446 cases of undetected dementia with a prevalence rate of 61.7%. Undetected dementia was more prevalent in lower income areas and community-based settings with 50.9% found in nursing residential homes. This meta-analysis concluded that undetected dementia is higher for younger patients with dementia and men.

Quality Improvement Project

The purpose of this QI project was to increase SLUMS screening in a long-term care facility in a rural Midwestern state and to establish baseline SLUMS screenings for eligible residents. The aim was to increase the rate of SLUMS screening by at least 75% for residents at this facility. Additionally, for those residents who screened positive for

MNCD or dementia, treatment plans were evaluated to assess for changes made resulting from SLUMS screening. The questions this project addressed included:

In residents 65 years old or older, who reside in a long-term care facility in a rural Midwestern state:

- What was the rate of completed SLUMS for eligible residents?

- What was the rate of refusals for SLUMS screening?

- What was the rate of MNCD and AD before and three months after screening implementation?

- When there was a positive score for MNCD or AD, what percentage had a change made to the treatment plan after screening?

The selected evidenced-based framework for this QI project was the Institute of Health's Plan-Do-Study-Act (PSDA). This framework includes four stages, and the purpose of implementing the PDSA cycle in this long-term care facility was to assess the impact of implementing the SLUMS screening in this specific setting and to evaluate changes to treatment plans for those residents with positive scores. (Reed et al., 2016).

Review of Literature

A review of literature was conducted using databases including CINHAL, Public/Publisher MEDLINE (PubMed), and APA (American Psychiatric Association) PsycArticles. Keywords used included *Saint Louis University Mental Status, St. Louis University Mental Status, SLUMS, mild cognitive impairment, and dementia* with Boolean operators AND and OR. Initial results yielded over 536 results. Results were refined with inclusion criteria including long-term care facility resident, 65 years or older, other medical conditions affecting cognition ruled out, and able to hear and speak

English. Exclusion criteria included: non-long-term care resident, 64 years or younger, medical condition affecting cognition, and inability to hear or speak English. Additional search criteria included full text available, journal articles, and published between 2016 and 2021, resulting in 27 articles, of which 10 articles were retained for use in this literature review after duplicates were removed.

Lifestyle Factors

In many countries the incidence of age-specific dementia has fallen due to nutrition, education, health care, and lifestyle changes (Livingston et al., 2020). Physical health plays a vital role in cognition. Individuals with dementia have more physical health problems and have more hospital admissions. Hospital admissions for dementia patients were higher for medical problems including fractures, infections, and head injuries. Hospital stays were significantly longer for those with dementia compared to those without, with 16.4 days and 8.9 days respectively (Draper et al., 2011).

There are 12 modifiable risk factors for dementia, contributing to approximately 40% of cases, which could be delayed or prevented (Livingston et al., 2020). Public health initiatives focused on head injury prevention and reduction of unhealthy alcohol consumption are essential due to these factors increasing the risk of dementia. Policies continue to be implemented to reduce other modifiable risk factors of dementia such as smoking, with many areas restricting smoking in public spaces due to secondhand smoke exposure (Nuyts et al., 2020). Additionally, recent laws have passed increasing the age one can purchase tobacco products from 18 to 21. Other modifiable risk factors include hearing loss, hypertension, physical inactivity, diabetes, obesity, depression, lack of

social contact, and air pollutants (Livingston et al., 2020). It is imperative to address

social determinants of health factors to reduce these modifiable risks of dementia.

There is a greater prevalence of undiagnosed MNCD and dementia in low-income

areas, and as such, prevention efforts such as early screening in these areas may have a

greater impact on outcomes (Lang et al., 2017; Livingston et al., 2020). Individuals with

lower socioeconomic status may experience poor nutrition, limited healthcare and

treatments, and experience increased exposure to pollution. In addition, the lower

education level prevalent in lower socioeconomic areas can put those living in poverty at

risk for poor cardiovascular health. In these low-income areas, research shows residents

are less physically active, have higher rates of diabetes and hypertension, and are more

likely to smoke, all of which are modifiable risk factors that can prevent or delay

dementia. It is believed that lower education levels increase the risk for developing

dementia due to a lack of cognitive reserve, which refers to the brain's capability to

produce cognitive networks for the completion of cognitive tasks (AA, 2020).

Caregivers

Those suffering from MNCD or dementia often require high levels of care which

is typically provided by family members, most commonly spouses or children, which

results in high caregiver burnout rates and decreased quality of life for caregivers (Zhu et

al., 2015). According to the American Association of Retired Persons (AARP) the

prevalence of dementia caregiving rose from 16.6% in 2015 to 19.2% in 2020 (AARP

and National Alliance for Caregiving, 2020). Estimates from the Centers for Disease

Control (CDC) (2019) find that these unpaid family caregivers provide those with

dementia with greater than 18.5 billion hours of care giving. Estimates show that 25% of

caretakers in the U.S. provide care for a parent and children under age 18. Over half provide care for at least four years, and 60% are expected to continue providing care for the next five years.

The ability to provide adequate care for those living with dementia increases caregiver risks for depression and anxiety and can lead to an inferior quality of life (AA, 2021). Approximately 25% of caregivers feel providing care has negatively impacted their personal health. Caregivers risk compromised health such as impaired immune function, increased stress hormones, heart disease and deceased wound healing. Furthermore, in 2020, 21% of caregivers self-reported their health as being fair to poor, an increase of 4% since 2015 (AARP and National Alliance for Caregiving, 2020). Approximately 30-40% of caregivers of those with dementia experience depression compared to 5-17% amongst non-caregivers, and the rate of caregiver anxiety was found to be 44% (AA, 2021). Caregiver strain increased healthcare costs with an estimated $9.7 billion in healthcare costs in 2014 (AA, 2015).

According to the AARP only 29% of caretakers were asked by providers about their needs regarding their ability to provide care, and only 13% addressed self-care, a decrease from 2015 (AARP and National Alliance for Caregiving, 2020). Clinicians often fail to provide prevention strategies and adequate resources for caregivers which results in increased caregiver burnout (AA, 2021). Clinicians who address caregiver needs can reduce caregiver burnout by providing education, resources, and support groups. Increasing dementia screenings and early detection of MNCD can result in improved quality of life, decreased healthcare spending, and decreased risk of caregiver burnout.

SLUMS ADHERANCE IMPROVEMENT

Saint Louis University Mental Status (SLUMS) Exam

The SLUMS Exam was developed in partnership with the Geriatrics Research, Education and Clinical Center at the St. Louis Veterans Administration Medical Center in 2006 to provide clinicians with an exam to detect MNCD. The utilization of the SLUMS has primarily been studied in U.S. Veterans though has been found to have and a high sensitivity and specificity (98%-100%) in non-veteran populations with adjustments made for level of education (Kansagara, & Freeman, 2010). The validity of the SLUMS in detecting MNCD is higher than many of the other commonly used screening tools such as the Mini-Cog, Montreal Cognitive Assessment (MoCA), Mini- Mental State Examination (MMSE), and Self-Administered Gerocognitive Exam (SAGE), and is a free assessment tool (Yoelin & Saunders, 2017). Utilization of the SLUMS can detect the presence of cognitive impairments and identify changes in cognitive functioning over time.

The SLUMS assessment tool consists of 11 questions for a total of 30 points, with a cut-off for normal cognitive function at 27 points in high school educated subjects and 25 for those with less than a high school education (Yoelin & Saunders, 2017). Scores for MNCD range from 21-26 for high school educated subjects and 20-24 for less than high school educated subjects. Scores ranging from 1-20 are indicative of dementia for high school educated subjects and 1-19 for less than high school educated subjects. This tool assesses attention, immediate recall with and without interference, orientation, memory, numerical calculation and registration, visual spatial reasoning, executive function, and extrapolation (Saint Louis University [SLU], 2021)

Summary

MNCD leads to dementia which is ranked in the top ten causes of death in the U.S. with an increase of cases expected over the next decade (AA, 2020). AD contributes to more than half of dementia cases and early detection improves patient quality of life. There are currently 12 identified risk factors which can be modified that account for almost half of dementia cases (Livingston et al., 2020). Estimates predicted by the CDC (2019) show that 25% of caretakers in the U.S. will provide care for a parent and children under age 18 which stresses the importance of early detection and treatment planning. By 2050, healthcare related costs are expected to quadruple from 2016 costs. The SLUMS was chosen for this project due to the high sensitivity, specificity, and validity. Implementation of SLUMS screening can improve early detection of MNCD and dementia and change treatment plans to improve patient care and outcomes.

Methods

Design

This QI project was a prospective record review containing quantitative, descriptive data. Quantitative data was collected including the number of SLUMS administered, SLUMS scores, treatment plan changes, medication changes, and the number of residents diagnosed after implementation. All records of residents receiving care from the Psychiatric Mental Health Nurse Practitioner (PMHNP) from January 4, 2022, through April 4, 2022, were reviewed for this QI project.

Setting

This project took place in a long-term care facility that is part of a larger healthcare organization located in a rural Midwestern state. This facility has approximately 80 employees and approximately 100 residents.

Sample

This project used a convenience sample of records for adults residing in a long-term care facility. Inclusion criteria was resident of the long-term care facility, 65 years of age and older, and with a known education level. Exclusion criteria included those not residing at this long-term care facility, under 65 years of age, and with no known education level. Most residents at this long-term care facility were Caucasian males. The desired sample size was approximately 100 residents.

Data Collection and Analysis

All records of residents receiving care from the PMHNP from January 4, 2022, through April 4, 2022, were included in the analysis. Demographic data collected included age, gender, race, and level of education. Other data collected included SLUMS score, treatment plans, and medication records. These was minimal risk to residents as this was no more than usual care provided by the PMHNP. Descriptive statistics were utilized to analyze this data set as inferential statistics were not appropriate for the data collected.

Approval

Formal written approval was sought from the participating agency on October 23, 2021, and the required agreement documentation was obtained. Additionally, the University of Missouri-St Louis (UMSL) Institutional Review Board (IRB) approval was obtained on January 4, 2022.

Procedures

It was identified by key stakeholders that the newly acquired long-term care facility had no formal diagnoses, medications, or treatment plans for residents with MNCD or dementia. The current process for cognitive impairment screening was reviewed, and stakeholders decided to implement the practice change to conduct SLUMS screenings annually on all eligible residents and adjust medications and treatment plans accordingly. The PMHNP at this long-term care facility conducted the SLUMS screenings and recorded the data in the facility's database. Records were reviewed after three months post practice change, and data was collected and analyzed to assess the impact of this change.

Results

Demographics

Of the 100 residents at the long-term care facility, 75% of residents met inclusion criteria and were screened, 4% met inclusion criteria but refused the SLUMS screening, and 21% did not meet inclusion criteria. SLUMS screenings were conducted on 75 out of 79 eligible (94.94%) residents by the PMHNP, between January 4, 2022, and April 1, 2022 (see Appendix A). The age of residents included in this quality improvement project ranged from 65-98 years old. Racial make-up included 98.7% Caucasian ($n = 74$) and 1.3% African American ($n = 1$). There were 39 male residents (52%) and 36 female residents (48%) in this sample ($N = 75$). Of the total sample, 68% ($n = 51$) had completed high school or obtained a GED and 32% ($n = 24$) completed less than a high school education (see Appendix B).

Pre-SLUMS Diagnoses and Medications

Of the 75 screened residents, a total of 31, or 41.33%, had a diagnosis of dementia or MNCD prior to SLUMS screening. Of those with a pre-screening diagnosis, 14.7% (n = 11) had a diagnosis of dementia due to AD, 18.7% (n = 14) had a diagnosis of MNCD, 8% (n = 6) had a diagnosis of dementia related to other causes, and 57.8% (n = 44) had no prior diagnosis (see Appendix C). Three residents were on medication for AD with no diagnosis listed in their chart prior to screening, and of the 75 eligible residents, 20.0% (n = 15) were on medications for AD with a diagnosis of AD or MNCD, 4.0% (n = 3) were prescribed medications for AD but had them discontinued due to lack of benefit prior to implementation, and 76.0% (n = 57) were not on medications for AD and had no diagnosis of dementia or MNCD prior to screening implementation.

Post-SLUMS Diagnoses and Medications

After implementation of SLUMS screening, a total of 74.67% (n = 56) of residents had a diagnosis of dementia or MNCD. AD dementia diagnosis increased by 22 residents, resulting in 44% (n = 33) with a diagnosis of AD. MNCD diagnosis increased by one resident resulting in 20% (n = 15) of residents with this diagnosis. There was a total of 10.7% of residents (n = 8) with a diagnosis of dementia suspected from other causes. In this sample, 25.3% (n = 19) did not meet criteria for dementia or MNCD after SLUMS screening. After implementation of this practice change, 34.7% (n = 26) of residents were started on medications to delay the progression of AD, 20.0 % (n = 15) were on medications prior to implementation and two of those residents had medications discontinued due to treatment plan changes resulting from SLUMS screening. Of the total sample, 4.0% (n = 3) of residents were not restarted on medications due to lack of benefit after treatment plan changes. There were 41.33% (n = 31) of residents who did not start

on medications for a variety of reasons including lack of benefit, denied by guardian, awaiting clinical trial, dementia of forms other than AD, and SLUMS score indicating no cognitive impairment (see Appendix D).

Of the 31 residents with a diagnosis, 61.29% ($n = 19$) had no medications and after implementation, 32.23% ($n = 10$) of those residents were placed on medications. Additionally, 9.68% ($n = 3$) of residents had worsening cognitive impairment which had progressed to dementia. Two out of 12 residents (16.67%) who had a pre diagnosis and medications were able to be taken off medication due to lack of benefit. After implementation, 21.33% ($n = 16$) of residents were prescribed medications and had an accurate diagnosis. Residents who scored in the normal cognition range ($n = 19$, 25%) will be receiving annual SLUMS assessment to address concerns regarding cognitive decline in the future.

Discussion

The results of this QI project indicate that implementation of annual SLUMS screenings can improve early diagnosis and treatment for MNCD and dementia, which may help slow the progression of AD. This QI project was the first phase of a PDSA cycle and showed clinically significant changes to diagnosis and treatment plans including changes to medications. This improved resident outcomes for those residing at this long-term care facility in rural Midwestern state. Based on the clinically significant impact of this QI project, it is recommended that this organization implement this practice change at all other long-term care facilities. Recommendations for the next cycle of the PDSA includes referrals to neurology, changes to level of care, and discussing other treatment options such as clinical trials. Additionally, it is recommended that

changes to treatment plans resulting from SLUMS screening continue to be discussed in treatment teams and should include the guardian or caregivers and resident. Of note, due to insurance company requirements for certain AD treatment medications, coordination with or referral to a neurologist should be considered to ensure access to appropriate treatments.

With a large sample size and low refusal rate, there were minimal limitations for completing this QI project. One limitation that was observed was time constraints for the provider to complete all SLUMS exams in the indicated timeframe. This limitation demonstrates a need to educate more qualified clinicians to improve adherence to SLUMS exams and ensure completion annually.

Conclusion

This QI project aimed to evaluate the increase of SLUMS screening of residents at a long-term care facility in a rural Midwestern state by at least 75% and to establish a baseline SLUMS screening score for eligible residents to address concerns as it relates to cognitive functioning. The QI project yielded clinically significant results which will impact current medical practices. Based on the data provided, implementation of the SLUMS screening tool improved accurate diagnoses and treatment outcomes. Providers can identify early signs of cognitive decline, provide annual screenings to assess impairment or establish a baseline, and implement treatment early to slow the progression of AD.

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SLUMS ADHERANCE IMPROVEMENT

Appendix A
Figure 1: SLUMS Eligibility

Appendix B

SLUMS ADHERANCE IMPROVEMENT

Figure 2: Demographic Factor of Residents with Completed SLUMS
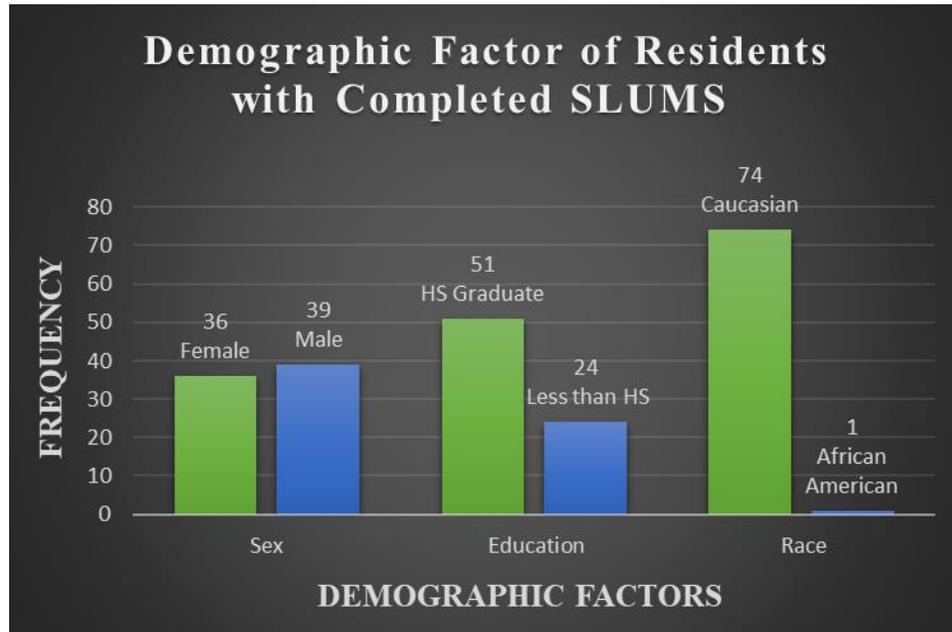
Appendix C

SLUMS ADHERANCE IMPROVEMENT

Figure 3: Diagnosis Pre/Post SLUMS of Residents with Completed SLUMS

Diagnosis Pre/Post SLUMS of Residents with Completed SLUMS

■ Prior to Implementation   ■ After Implementation
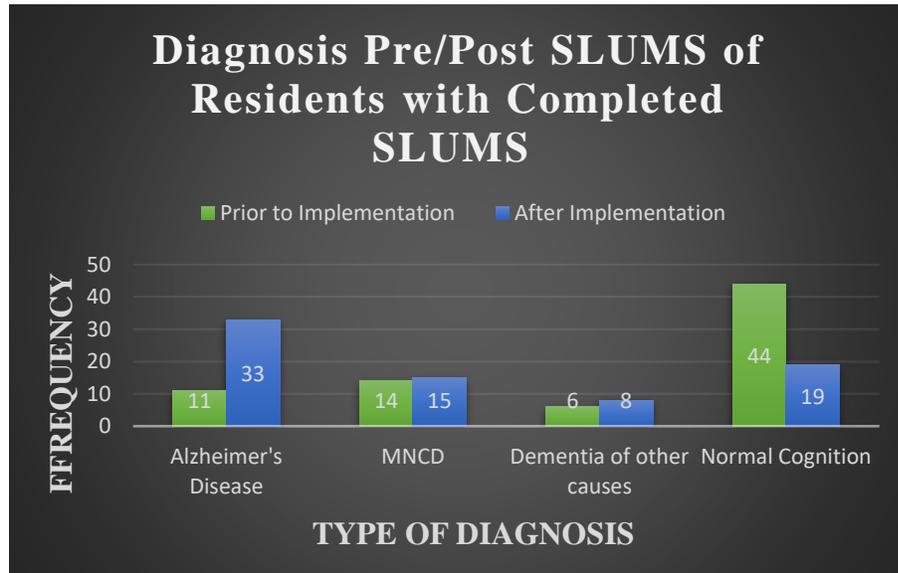
Appendix D
Figure 4: Medication Pre/Post SLUMS Assessment

SLUMS ADHERANCE IMPROVEMENT