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Influences of Body Composition, Multimorbidity and Polypharmacy on Physical Mobility of Older Adults

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INFLUENCES OF BODY COMPOSITION, MULTIMORBIDITY AND POLYPHARMACY ON PHYSICAL MOBILITY OF OLDER ADULTS

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ABSTRACT

Background and Purpose: The prevalence of falls, and the resulting injuries and complications reflect a key concern in the older adult population. An increased risk of falls is highly correlated with decreases in physical mobility and related functions. The Timed Up-and-Go test (TUG) has an established reliability and validity in assessing physical function and the risk of falling in the older adult population. With age, a person typically has an increased number of health morbidities, which may be reflected in changing body composition and the number of medications associated with diseases. However, the influence of these factors on physical mobility in the older adult population has not been quantified. The purpose of this study was to investigate how common indicators of health, including body mass index (BMI), presence of multimorbidity and polypharmacy influence the TUG performance in the older adult population.

Methods: A total of 222 individuals ≥ 65 years of age were recruited (68 men and 154 women, mean age = 75.1 yrs). Additional subjects (28 men and 54 women, mean age = 72.7 yrs) from previous research were included in the analysis of BMI on TUG performance with a total of 304 subjects (96 men and 208 women, mean age= 74.4 yrs). Height and weight were obtained in conjunction with a medical history survey. Subjects completed 3 trials of the TUG test at 3 and 9 m walking distances. Comparison was made between 3 participant groups according to their BMI (underweight: BMI < 24 kg/m^2, normal weight: BMI 24-30 kg/m^2, overweight: BMI > 30 kg/m^2). Multimorbidity was categorized into 2 groups (multimorbidity: ≥ 2 morbidities, non-multimorbidity: 0-1 morbidity). Polypharmacy was categorized into 2 groups (polypharmacy: ≥ 5 medications, non-polypharmacy: 0-4 medications). Non-parametric tests were run for all 3 variables (BMI, multimorbidity, and polypharmacy).

Results: The underweight BMI group exhibited a trend of slower performance than normal weight BMI group for the 3 m (underweight = 8.8±5.3s, normal weight = 8.5±3.3s, p = 0.055) and the 9 m TUG distances (underweight = 17.3±8.9s, normal weight = 17.0±6.1s, p = 0.071). There was a trend toward the overweight BMI group having slower performance than the normal

weight BMI group on the 9 m distance (normal weight = 17.0±6.1s, overweight = 18.0±5.5s, $p = 0.069$). The group with ≥ 2 morbidities had slower performance on the 3 m (multimorbidity = 9.2±3.9s, non-multimorbidity = 7.7±2.1s, $p < 0.001$) and 9 m TUG distances (multimorbidity = 18.3±6.8s, non-multimorbidity = 15.6±4.0s, $p < 0.001$). The polypharmacy group had slower performance on the 3 m (polypharmacy = 9.6±3.3s, non-polypharmacy = 8.3±3.4s, $p = 0.001$) and 9 m TUG distances (polypharmacy = 19.1 ± 5.9s, non-polypharmacy = 16.7±6.0s, $p = 0.001$).

Discussion: Being underweight and overweight were shown to impact a person's walking ability. We expected overweight individuals to have a slower performance on the TUG but underweight individuals did as well. This could be due to frail older adults having decreased muscle mass and strength. Polypharmacy and multimorbidity were shown to also have a significant impact on mobility performance.

Limitations: The examined older adult population was relatively healthy as they are community dwelling individuals who are active in the retirement community.

Conclusion: This study provided quantitative information regarding the effects of common health indicators (BMI, status of multimorbidity and polypharmacy) on mobility. Understanding the impact of BMI, multimorbidity, and polypharmacy on TUG performance will assist in identifying patients at risk of decrease physical mobility and falls. Wellness interventions might include reducing/altering medications used or adopting a healthier BMI to improve mobility.

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INTRODUCTION

The prevalence of falls in America is a cause for major concern. According to the Centers for Disease Control and Prevention (CDC), 1 out of every 3 adults aged 65 and older falls each year, and that number increases to 1 out of every 2 adults aged 80 and older.[1-4] With this high frequency of falls comes a high number of injuries needing medical attention and hospitalization. The medical cost of fall related injuries in 2010 was about thirty billion dollars.[1] That number is projected to increase to over sixty billion dollars in the year 2020.[1] Although death is one of the more serious outcomes of falls, there are many other undesirable possible consequences including fear of falling, loss of confidence, and loss of independence.[3,5-7]

There are many assessment tools to help determine if an individual is at risk of falling. Amongst these tools are extensive selections of mobility assessment screenings. Mobility is used to assess whether or not someone is at risk of falling, and has been shown to be highly correlated with functional status, quality of life, and fall risk.[1,3,6] One of the more common mobility assessment tools is the Timed Up-and-Go test (TUG).[8] The TUG measures the time in seconds that a person takes to stand up from a chair, walk a short distance (3m), turn, walk back to the chair, and sit down.[8-11] Podsiadlo and Richardson validated the TUG test in a study of 60 elderly participants in which they showed significant correlations of the TUG with physical mobility, gait speed, and fall risk.[11,12]

Diseases and age-related changes contribute to risk factors for falls. Age related changes include a significant decrease in muscle strength and general mobility.[2,5,7] As the age-related physical changes occur, they are typically accompanied by a corresponding change in body composition. Research has shown that the change in body composition reflects an older adults' physical activity performance. In a study done by Marques et al. slower walkers had a high prevalence of obesity compared to faster walkers on the 6 minute walk test (6MWT).[13] In addition, Marques et al. demonstrated that body mass index influenced walking performance and that there is a significant correlation between strength of the lower extremity and walking ability. The relationship between body weight and functional limitations is typically U shaped, meaning those with low and high body weights are more likely to have functional limitations.[14] Idland et al. found that a higher BMI was associated with a poor TUG performance in community dwelling women aged 85 and older.[15] With the former study showing that lower BMI can result in functional limitations, further research is needed to determine the effect of low BMI or underweight on walking ability.

There are many diseases that can affect an individual's body composition and assist in the decline of physical performance. Individuals that are overweight or obese have a higher risk of developing arthritis and experiencing a stroke.[16,17] On the other hand, body mass index (BMI) is inversely associated with bone mineral density categories and other diseases related to bone mineral density.[18] Asomining et al. concluded the odds of osteoporosis decreased 12% for each unit increase of BMI in women. Diseases of the lung such as Chronic Obstructive Pulmonary Disease have been shown to reduce body mass and increase skeletal muscle wasting.[19] Parkinson's Disease is another disease that has been shown to impact patients BMI. Individuals with Parkinson's disease were found to have significantly higher prevalence of malnutrition and lower BMI values in comparison to control groups.[20]

Diseases that are associated with physical mobility limitations in older adults include: arthritis, cerebrovascular disorders, cardiac diseases, chronic obstructive pulmonary disease, and diabetes mellitus.[21-23] Decreased endurance capacity and body stiffness due to cardiopulmonary diseases and arthritis respectively, have been determined to be the specific characteristics for the explanation of physical mobility limitations.[23] Furthermore, experiencing multiple diseases at one time, defined as multimorbidity, can have a more profound impact on physical mobility.[24, 25] Studies have shown that physical mobility decreases rapidly as the number of morbidities increase, and physical disability rises exponentially with an increase in the number of morbidities.[26-28] Stuck et al. have shown that multimorbidity is a strong factor in functional decline.[29] Originally, Podsiadlo and Richardson considered the potential effects of multimorbidity on TUG performance. They concluded that for community dwelling elderly aged 60 to 90 without cognitive impairments but with other morbidities such as osteoarthritis or cerebral vascular disease, TUG performance ranged from 10 to 240 seconds.[30] With a small sample size for their study, it was impossible for them to accurately understand how multimorbidity affects TUG performance. There have been other studies that have determined disease-specific TUG performance such as for Parkinson's Disease, patients who have had stroke, and many more.[31] However, none have specifically investigated how multimorbidity affects TUG performance.[32,33]

A consequence of multimorbidity may be the use of multiple medications and this can potentially lead to a phenomenon termed polypharmacy.[34] There is much debate on the exact definition of polypharmacy but many have come to the conclusion that polypharmacy can be defined as the use of ≥ 5 prescription medications daily.[35-39]As the population of people 65 years and older rises, polypharmacy is becoming more prevalent.[38] In a survey of Medicare beneficiaries from 2003, nearly 90% of the beneficiaries were taking at least one prescription medication with 46% taking ≥ 5 medications.[34] The risk of complications (unwanted side effects or negative drug interactions) from polypharmacy rises in the older population due to the decreased ability to properly metabolize multiple medications.[36] Complications of polypharmacy include a decreased ability to perform instrumental activities of daily living (IADL) and physical mobility which can result in an increased risk for falls. Specifically, taking ≥ 5 medications daily may be an indicator for increased risk for falls, and decreased ability to perform IADL.[35,38,39] However, there have not been any studies that directly determine how polypharmacy affects TUG performance.

The purpose of this study was to investigate the effects of body composition (specifically BMI), multimorbidity, and polypharmacy on physical mobility performance (i.e. 3-meter and 9-

meter TUG tests) in older adults.BMI, morbidities, and medication use are important and simple-to-obtain indicators of health for older adults. Information gained from this research will be useful for clinicians to help identify patients at risk of developing mobility deficits.

METHODS

Subjects

The inclusion criteria for this study were 1) aged 65and over and 2) able to walk 50 meters (m) without assistance. Participants were excluded if any of the following conditions were present: unable to understand or follow the simple instructions from the testers; concurrent injuries causing pain/inability to walk for more than 50 m; and presence of any concurrent medical conditions (physical or mental) impairing ability to perform physical activities safely. Participants are permitted to use an assistive device if needed.

As this study was an ongoing research study, power calculation of the sample was not conducted. At the end of the data collection, 222 individuals were recruited without coercion from 5 approved data collection sites (adult activity centers) in the southern Nevada region. Prior to the data collection, the purpose and procedures were explained to each participant, and written informed consent, under the approval of Institutional Review Board at the University of Nevada, Las Vegas, was obtained from each participant.

Instrumentation

The main device used for the study (TUG test) is a unique TUG bench that was designed and validated in a previous study.[40] Briefly, this TUG bench consisted of a height-adjustable seat with a force plate installed on the bottom. The force plate is connected to a laptop with data software collecting time and force. The timer starts as soon as 90% of the person's weight lifts off the bench and stops when 90% of their weight is returned to the bench. The TUG bench was validated by a pilot research study that compared its timing system to a hand-held stopwatch. In that study, the TUG bench timer was found to be of excellent reliability ($ICC_{3,3}$ = 0.929 for 3 m TUG, $ICC_{3,3}$ = 0.934 for the 9 m TUG).[40]

The researcher conducting the 3 and 9 m TUG test established intra-rater reliability using the TUG bench prior to data collection. This was established by performing the TUG test on 5 participants, 2 separate days, with 3 trails each day. $ICC_{3,3}$ demonstrated acceptable reliability of 0.902.

A comprehensive survey was created to gather demographic information (age, gender, height, weight, and ethnicity) and self-reported medical information (numbers of morbidities and medications). Height was gathered with a measuring tape adhered to the wall. Weight was gathered with a calibrated portable scale. The medical information survey examined the presence of most common morbidities in the elder population that were related to physical mobility including osteoporosis, arthritis, diabetes mellitus, heart disease, pulmonary disease, stroke, Parkinson's disease, common vision impairments (cataracts, glaucoma, macular degeneration).[41-46] Furthermore, the self-reported number of daily prescription medications was assessed.

<u>Procedures</u>

The TUG was set up with the TUG bench 3 m away from an orange cone. The TUG bench's seat height was adjusted to the participant's knee level (90 degree of knee flexion) before the participant was given instructions to perform the test. The participant was instructed to keep his/her feet flat on the floor while sitting on the bench, then rise and walk toward the orange cone, around it, and back to sit down at a fast but safe speed. The participant was also instructed to sit still both before and after the test. One or two practice runs were first completed by the participant to make sure that he/she could perform the test in a safe and correct manner. Then 3 trial runs were performed. The same procedure was performed for the 9 m walking distance. It took approximately 10 minutes to complete the TUG test.

After the TUG test, the participant was brought to a survey station. The participant was guided to respond to the comprehensive survey. (See Figure 1 for Procedure Flow Chart)

Data Analysis

All Data analysis was done using IBM SPSS Statistics version 22 for Windows. The data collected from the study were descriptive (age, gender, ethnicity, number of morbidities, and number of medications) and quantitative (BMI and TUG time). A normality distribution for all variables (BMI, multimorbidity, polypharmacy, 3 m TUG, and 9 m TUG) was done using the Kolmogorov-Smirnov test. All variables were not normally distributed ($p < 0.001$) and thus non-parametric tests were used for statistical analysis.

BMI

BMI was divided into the 3 main classifications: underweight, normal weight, and overweight. BMI classifications were adjusted in our statistical analysis to accommodate our subject population of individuals 65 years and over. The BMI classification used are as follows; underweight < 24 kg/m^2, normal weight 24 – 30 kg/m^2, overweight > 30 kg/m^2.[47] The Kruskal-Wallis H test was conducted to determine if there was a difference between the 3 BMI classifications. Post-hoc analysis was conducted using the Mann-Whitney U test.

Multimorbidity

Based on the definition of multimorbidity, subjects were divided into 2 groups (multimorbidity, non-multimorbidity).[24,25] Subjects with ≥ 2 morbidities were placed in multimorbidity, while subjects with 0-1 morbidity were placed in non-multimorbidity. The Mann-Whitney U test was performed to determine if there was a difference between the 2 groups.

Polypharmacy

Polypharmacy has been defined as ≥ 5 medications and thus our groups were polypharmacy and non-polypharmacy.[35-39] People taking ≥ 5 prescription medications were labeled as polypharmacy and people taking 0-4 prescription medications labeled as non-polypharmacy. The Man-Whitney U test was conducted to determine if there was a difference between the 2 groups.

RESULTS

There were 222 subjects (68 men and 154 women, mean age = 75.1 yrs) included in analysis of multimorbidity and polypharmacy effects on TUG performance. 82 subjects (28 men and 54 women, mean age = 72.7 yrs) from previous research were included in the analysis of BMI on TUG performance with a total of 304 subjects (96 men and 208 women, mean age = 74.4 yrs). (See Table 1)

BMI

Kruskal-Wallis H test was used to determine significant differences between BMI classifications and both the 3 and 9 m TUG performances. There was a statistically significant difference in 3 m TUG performance among underweight BMI, normal weight BMI, and overweight BMI (underweight = 8.79±5.26s, normal weight = 8.50±3.30s, overweight = 9.04±3.31s; $p = 0.025$). Post-hoc comparison revealed a trend that individuals with an underweight BMI exhibited diminished TUG performance than individuals with a normal weight BMI on the 3 m TUG ($p = 0.055$). However, individuals with underweight BMI performed significantly better than overweight BMI ($p = 0.008$). There was no difference in performance between normal weight BMI and overweight BMI ($p = 0.222$, Figure 2).

There is a statistically significant difference in 9 m TUG performance among older adults who had underweight BMI, normal weight BMI, and overweight BMI (underweight = 17.28±8.86s, normal weight = 16.95±6.05s, overweight = 18.01±5.51s, $p = 0.009$). Post-hoc comparison revealed a trend that individuals with an underweight BMI performed slower than individuals with a normal weight BMI on the 9 m TUG ($p = 0.071$). However, those in the underweight BMI group performed significantly better on the 9 m TUG in comparison to overweight BMI ($p = 0.003$). There was a trend that normal weight individuals performed better on the 9 m TUG than overweight individuals ($p = 0.069$, Figure 3).

Multimorbidity

The Mann-Whitney U test was used to determine a difference between the multimorbidity and non-multimorbidity groups on the 3 and 9 m TUG. There was a significant difference between the multimorbidity group compared to non-multimorbidity group performing slower on the 3 m (multimorbidity = 9.18±3.89s, non-multimorbidity = 7.75±2.15s, $p < 0.001$) and 9 m TUG (multimorbidity = 18.32±6.84s, non-multimorbidity = 15.60±3.97s, $p < 0.001$, Figures 4 and 5).

Polypharmacy

The Man-Whitney U test was used to determine a difference between the polypharmacy and non-polypharmacy groups on the 3 and 9 m TUG. There was a significant difference between the polypharmacy group compared to the non-polypharmacy group performing slower on the 3 m (polypharmacy = 9.61±3.28s, non-polypharmacy = 8.33±3.36s, $p = 0.001$) and 9 m TUG (polypharmacy = 19.13 ± 5.86s, non-polypharmacy = 16.70±5.95s, p = 0.001, Figures 6 and 7). (For an overall look of the results, see Table 2)

DISCUSSION

Our results showed that all 3 variables (BMI, multimorbidity, polypharmacy) can affect TUG performance. The underweight BMI group exhibited a trend of slower performance than normal weight BMI group for the 3 and 9 m TUG. There was a trend toward the overweight BMI group having slower performance than the normal weight BMI group on the 9 m TUG. The group with ≥ 2 morbidities exhibited poorer TUG performance on both the 3 and 9 m walking distances. Similarly, the polypharmacy group exhibited slower performance on both the 3 and 9 m walking distances.

The statistically significant difference on TUG performance between the 3 BMI classifications indicated that an individual's BMI has a significant impact on physical performance. It should be noted that BMI classifications used in this study differ from the World Health Organization's (WHO) classifications. Evidence suggests that the WHO classifications do not fit the aging population appropriately. In a recent meta-analysis of 32 cohort studies of older adults ≥ 65 found a U-shaped relationship between BMI and all-cause mortality. Lowest risk of mortality was reserved for individuals with a BMI between 24 to 31 kg/m^2.[47,48] Therefore we anticipated a decreased performance in older adults with underweight (< 24 kg/m^2) and overweight BMI (> 30 kg/m^2). For both the 3 and 9 m there was a U-shaped distribution of TUG performance. This indicates that individuals that were underweight and overweight exhibited diminished mobility performance compared to those with a more normal BMI. This finding is consistent with the previously mentioned study by An et al., where researchers found a U-shaped relationship between body weight and functional limitations.

Additionally, there are diseases commonly associated with a higher BMI such as arthritis or stroke that can negatively impact physical mobility.[16,17] Conversely, there are diseases associated with a lower BMI such as osteoporosis, COPD, and Parkinson's disease.[18-20] It is possible that the poorer performance that is seen with individuals with low or high BMI may be related to associated symptoms of the disease that can effect physical function. Falsarella et al. investigated the effect of muscle and bone mass on mobility in older women.[49] It was found that individuals with low muscle mass demonstrated a slower gait speed and a poor TUG performance. Low BMI associated diseases mentioned above also cause a lessening of muscle mass as a result of the disease process. The poor performance seen with these individuals may be due to the decline in muscle mass from their diagnosis rather than the low BMI categorization. Therefore individuals that are healthy with a low BMI may perform well on the TUG Test.

Our results showed that there was a significant difference on the 3 and 9 m TUG performances between multimorbidity and non-multimorbidity groups. The multimorbidity group performed significantly slower than the non-multimorbidity group on both 3 and 9 m TUG. This finding suggested that multimorbidity have a negative effect on physical mobility in older adults by declining their walking speed, which is in agreement with previous studies of multimorbidity and the associated decreased physical mobility.[26-28] In older adults, coexisting morbidities (≥ 2) have a direct relationship with functional impairments and disability in activities of daily living.

Other previous studies have also looked into the effect of different combinations of morbidities on physical function. One study has discussed that different combinations of morbidities may influence physical function differently.[50] For instance, arthritis with visual impairment causes physical mobility impairment, while arthritis with stroke affects higher physical function and self-care.[50] Another study has shown that the odds ratio of having physical mobility impairment was 2.3 for cardiovascular disease only, 4.3 for arthritis only, and 13.6 for cardiovascular disease and arthritis together.[51] In other words, certain combinations of morbidities can have exponential effect instead of straight up addition effect on physical mobility.[51] Moreover, multimorbidity made up of diseases that each influences physical function but through a different mechanism may have more detrimental effect on physical function.[24] As a result, close examination of different multimorbidity combinations and their effect on TUG performance should be implemented in future studies.

Our results showed that there was a significant difference on the TUG performance between individuals with polypharmacy and non-polypharmacy. People who were in the polypharmacy performed slower than non-polypharmacy on both the 3 and 9 m TUG. This finding suggests that polypharmacy affects physical mobility in older adults and needs to be a consideration when treating this population. This finding is in agreement with studies of polypharmacy and the associated increased risk of falls and decreased physical function.[35,38,39] Some studies have found that the prevalence of falling for older adults taking 5 or more medications is more than 50%.[52] With this high prevalence, health care practitioners need to be more aware of polypharmacy effects on a person's physical function.

There is also a growing concern of prescription drug abuse in the older population.[52] According to the National Institute on Drug Abuse, the older adult population accounts for more than one-third of the total expenditure on prescription medications in the US. Medication abuse in older adults can be due to many factors such as age-related changes in drug metabolism, decreased ability to excrete multiple medications, decrease in compliance leading to misuse, and concurrent use of over the counter medications and or dietary supplements.[36,52,53] This abuse and high prevalence of polypharmacy in older adults increases the risk for major drug-on-drug interactions which can impair cognition and decrease physical function and thus can further increase the risk of falls.[35,38,39,52]

With this knowledge, practitioners can begin to look at polypharmacy as a possible contribution to slower TUG performance and decreased mobility. Polypharmacy is a factor that can be modified by healthcare practitioners.[54] It may be of importance for health care practitioners to examine the number of medications their patients/clients are taking and the possible interactions associated with their medications. In doing so, they could help reduce the medications or refer for medication evaluation in order to reduce the effect of polypharmacy on their physical mobility.

Limitations

One of our limitations was the population we collected data from. This study was done in Las Vegas, Nevada and thus generalization of the study findings is limited. The 5 collection sites were all active adult centers, where the individuals were relatively healthy subjects. Our goal was to collect from those who were considered community dwelling, but by doing this, we may have collected from a more active population than that of normal community dwelling older adults. Morbidities were self-reported and therefore could not be confirmed with medical records. Additionally, the number of morbidities among the study participants was different while they all functioned physically at a similar level consistent with the definition of community dwelling.

As stated above, the 3 factors influencing physical mobility correlate with each other. Therefore, one factor cannot be assumed to be responsible for the decline in mobility or poorer performance. Furthermore, the severity level of each disease, which was difficult to determine without any available staging techniques, could have contributed more or less to the overall effect of multimorbidity on physical function (TUG performance).Finally, the additional data on subjects included in the BMI analysis were from the aforementioned pilot study that validated the automated TUG bench.

CONCLUSION

This study found a trend that underweight and overweight negatively affected a TUG performance. Additionally, multimorbidity and polypharmacy were shown to negatively impact a TUG performance. The clinical significance of our findings is that health care practitioners will be able to utilize this knowledge as an additional tool in the hopes to increase physical mobility of their patient/clients. This can be done by assessing for polypharmacy and medication necessity in order to help reduce the effect of their medications on their physical mobility. Health care practitioners can also examine their patient/clients BMI to determine if their nutritional status is adequate and recommend weight control/management interventions as needed.

Figure 1. Flowchart of procedures

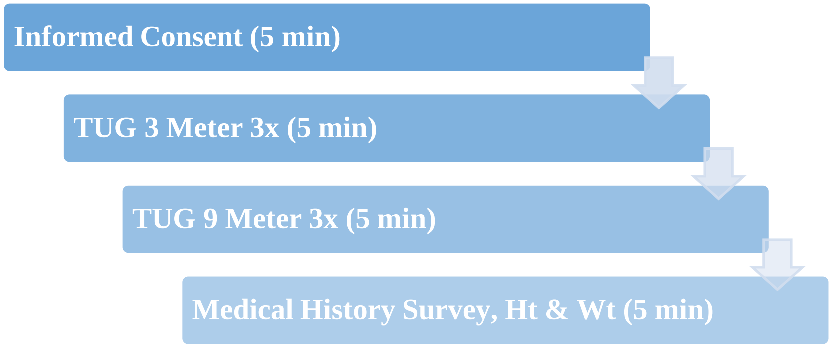

Table 1. Demographics of all participants included in analysis

	Men	**Women**	**Total**
Number	96	208	304
Age (year)	74.1 ± 6.3 (65-92)	74.6 ± 7.0 (65-97)	74.4 ± 6.8 (65-97)
Height (m)	1.8 ± 0.1 (1.6-1.9)	1.6 ± 0.1 (1.4-1.8)	1.7 ± 0.1 (1.41-1.93)
Weight (kg)	89.7 ± 15.2 (56.7-130.1)	68.0 ± 14.0 (38-126.1)	74.9 ± 17.6 (38-130.1)
BMI (kg/m^2)	28.9 ± 4.5 (19.4-41.7)	26.0 ± 4.8 (15.8-44.7)	26.9 ± 4.9 (15.8-44.7)

Figure 2. Bar Graph of TUG Performance and BMI

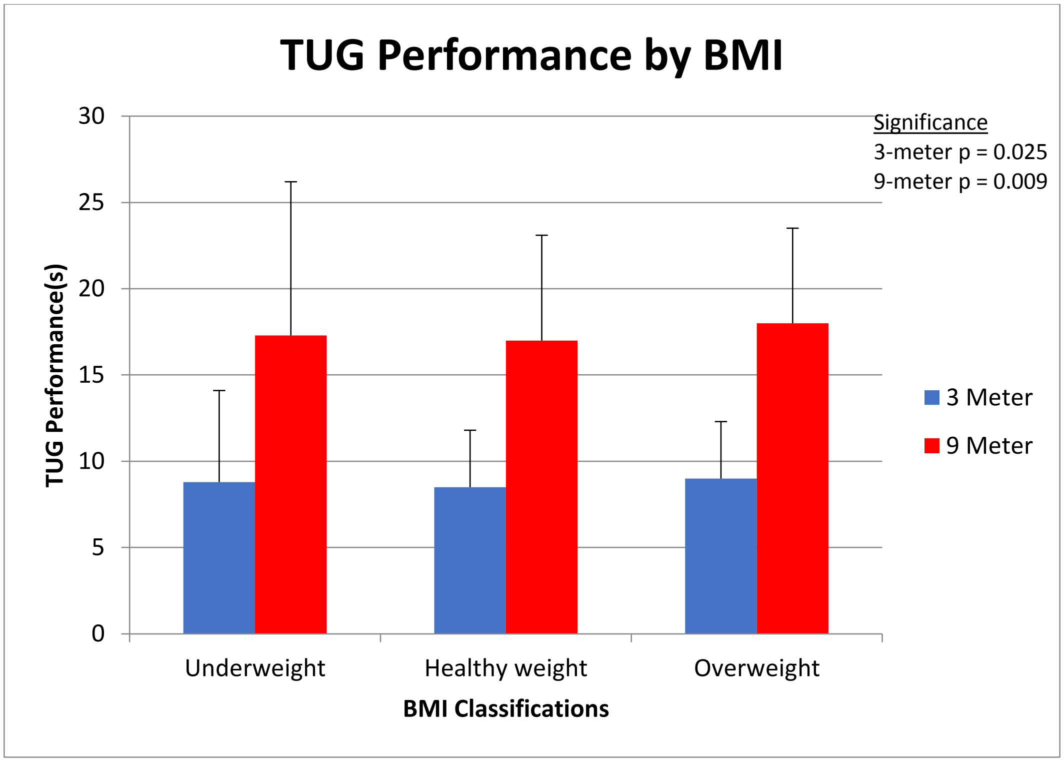

Figure 3. Bar Graph of TUG Performance and Multimorbidity

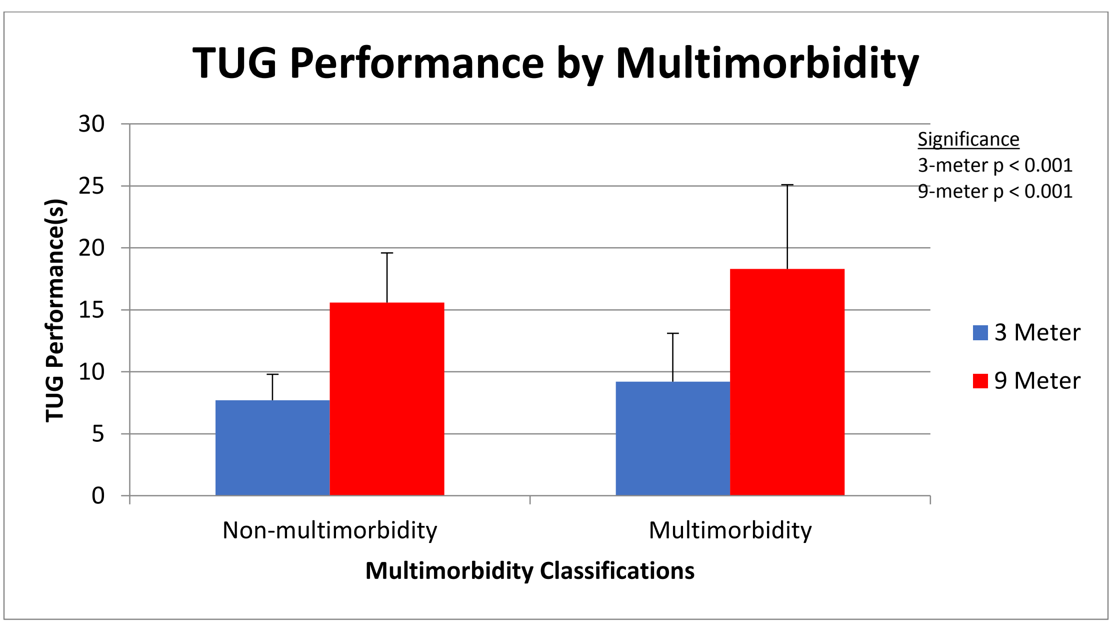

Figure 4. Bar Graph of TUG Performance and Polypharmacy

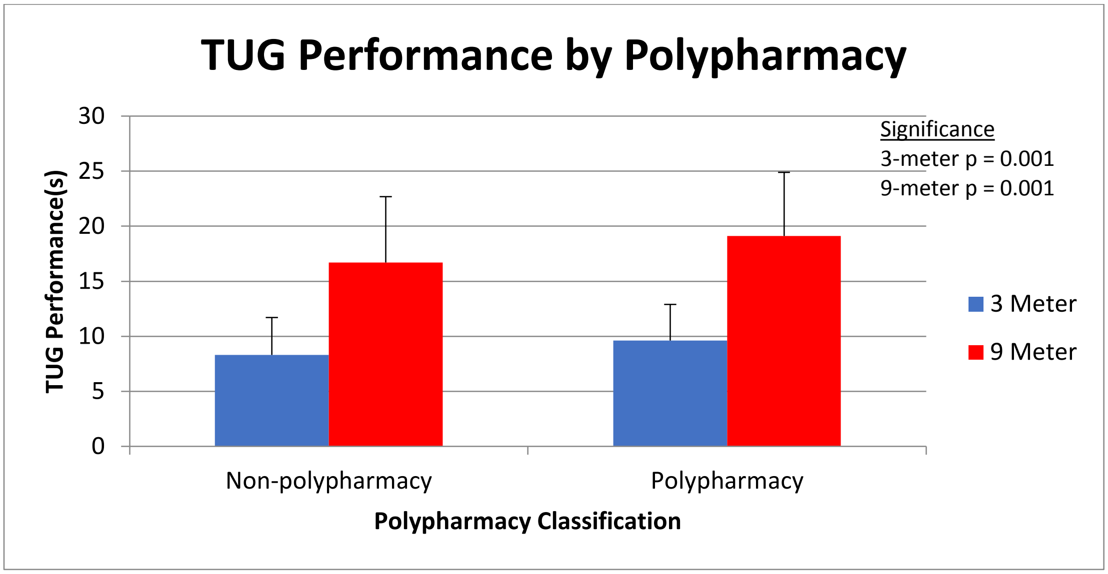

Table 2. Results of all 3 variables

		Groups	# of Subjects	TUG (s)	Significance
BMI	3 Meter TUG	Underweight BMI (≤23 kg/m2)	71	8.8±5.3	p = 0.025
		Healthy weight BMI (23-30 kg/m2)	156	8.5±3.3	
		Overweight BMI (>30 kg/m2)	77	9.0±3.3	
	9 Meter TUG	Underweight BMI (≤23 kg/m2)	71	17.3±8.9	p = 0.009
		Healthy weight BMI (23-30 kg/m2)	156	17.0±6.1	
		Overweight BMI (>30 kg/m2)	77	18.0±5.5	
Multimorbidity	3 Meter TUG	Non-multimorbidity (≤ 1 morbidity)	89	7.7±2.1	p < 0.001
		Multimorbidity (≥ 2 morbidities)	133	9.2±3.9	
	9 Meter TUG	Non-multimorbidity (≤ 1 morbidity)	89	15.6±4.0	p < 0.001
		Multimorbidity (≥ 2 morbidities)	133	18.3±6.8	
Polypharmacy	3 Meter TUG	Non-polypharmacy (0-4 Medications)	174	8.3±3.4	p = 0.001
		Polypharmacy (5+ Medications)	48	9.6±3.3	
	9 Meter TUG	Non-polypharmacy (0-4 Medications)	174	16.7±6.0	p = 0.001
		Polypharmacy (5+ Medications)	48	19.1±5.9	

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