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Hand Assessment for Elderly People in the Community

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BACKGROUND: Hand conditions are common in elderly persons.

PURPOSE: To assess the prevalence of common hand conditions in elderly persons in a community setting, specifically osteoarthritis of the hand, trigger finger, and carpal tunnel syndrome.

METHODS: The elderly persons were recruited from community groups for elderly persons. Data collection included participants' demographic and clinical data; quick disability, arm, shoulder, and hand (QuickDASH) questionnaire; and presence of hand conditions.

RESULTS: Of the 55 elderly persons recruited, almost a third of them presented with a hand condition ($n = 17$, 30.8%). Hand conditions were more common in females (39% in females, 7% in males; $\chi^2 = 4.97$, $p = .04$). QuickDASH scores were higher in those with hand conditions, indicating lower levels of function (greater disability) ($t = -4.61$, $p = .002$).

CONCLUSIONS: Most elderly persons did not seek medical attention for their hand condition until the late stages. Nurses can play an important role in providing community hand assessment, education on hand symptoms, information about available treatment, and adaptive approaches to maximize functioning.

Background

Hand and wrist problems are common in the general population, with prevalence ranging from 3% to 17% (Palmer, 2003). Severity and duration of symptoms rises with age. A previous study reported that 47% of the population older than 50 years had hand problems over a 1-year period, and 31% experienced hand pain over a 1-month period (Dziedzic et al., 2007). This pain resulted in loss of hand function and difficulties completing everyday tasks. Common hand conditions in elderly persons include osteoarthritis, trigger finger, and carpal tunnel syndrome.

The prevalence of symptomatic osteoarthritis is 15.9% and 8.2% in women and men, respectively (Haugen et al., 2011). Osteoarthritis is characterized by loss of cartilage, subchondral sclerosis, and osteophytes formation. It most commonly affects the distal interphalangeal joint, followed by the proximal interphalangeal joint (Botha-Scheepers et al., 2009; Dahaghin et al., 2005). Elderly people with osteoarthritis often complain of pain and stiffness. The potential joint deformities can limit movement and adversely affect hand function. As a result of its detrimental impact on quality of life and financial repercussions incurred by the accompanying loss of autonomy, osteoarthritis poses a burden for individuals and society on a broader scale (WHO Scientific Group, 2003; Woolf & Pfleger, 2003).

Trigger finger, or stenosing tenosynovitis of the digits, is another common condition that has a prevalence of 2.6% in the general population (Makkouk, Oetgen, Swigart, & Dodds, 2008). The condition arises from inflammation and subsequent narrowing of the annular one (A1) pulley, which in turn leads to symptoms including pain, clicking, catching, and loss of motion of the affected finger. Trigger finger is more common in women than in men and people in their 50s and 60s (Choudhury & Tay, 2013; Choudhury & Tay, 2014).

Carpal tunnel syndrome has a prevalence of 1%–3% in the general population (Atroshi et al., 1999; Katz et al., 1990); incidence is highest in those who are in their late 50s (Bland & Rudolfer, 2003). It is caused by compression of the median nerve at the wrist and can manifest as pain, numbness, and tingling in the distribution of the median nerve in the hand (Viera,

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2003). Carpal tunnel syndrome results in lower hand (grip and pinch) strength (Baker, Moehling, Desai, & Gustafson, 2013), and the numbness contributes to increased clumsiness.

Despite well-established treatment options, hand conditions are often overlooked, underdiagnosed, and consequently undertreated among the elderly people. This could be attributed to factors such as lack of knowledge of these conditions and innocuous symptoms in the early stages, resulting in a lack of perceived need to seek medical attention. Hence, the elderly population often seek medical attention only when their activities of daily living (ADLs) are severely affected, which is often an indication of the condition having advanced considerably. However, early diagnosis and management of these conditions can lead to satisfactory resolution of the symptoms or prevent further exacerbation of the disease. This study aimed to assess the prevalence of common hand conditions in the elderly people in a community setting, specifically osteoarthritis of the hand, trigger finger, and carpal tunnel syndrome.

Methods

Medical officers and a nurse conducted the hand assessment between October and November 2016. Participants were recruited from community groups for elderly persons, specifically the Active Aging Group (AAG) and the Silver Ace Senior Activity Centre (SAC) at Bukit Merah in the Central Region of Singapore. The AAG and the SAC are neighborhood day centers, places where the elderly socialize with their peers. The managers of these groups were contacted and informed of the study procedures before conducting the assessment. Based on the United Nations (2015) definition of "older persons" we included those aged 60 years or older; for the purposes of this study, this population will be referred to as "elderly." All the elderly people were ADL independent. Elderly persons who complained of symptoms or presented with clinical signs of hand conditions were advised to promptly consult a doctor if they had not already done so. The center managers were also informed concurrently so that they could follow up with the elderly people.

Data Collection

Participant demographics included age, gender, and race. Clinical data obtained were hand dominance, bilateral grip, and pinch strength. Grip and pinch strength were measured using the hand and pinch dynamometer, respectively, in kilograms. During measurement, participants were seated on a chair with their arms close to the body, perpendicular to their sides.

The quick disability, arm, shoulder, and hand (QuickDASH; Beaton, Wright, & Katz, 2005) questionnaire was administered to assess functional ability of the upper limb. The questionnaire consisted of 11 questions, with scores ranging from 11 to 55, with the lower scores representing the least disability and better upper limb function. High validity and reliability were reported for the questionnaire, with a Cronbach's α of 0.92 and test–retest reliability (intraclass correlation) coefficient of 0.94.

A general medical history was obtained from those with hand conditions, including questions such as side and site of symptoms, duration, previous trauma, previous medical consultation, or treatment (if any). Pain score was obtained and rated on a numerical scale, with 0 representing no pain and 10 for the worse possible pain. For hand osteoarthritis, the assessment also included pain, stiffness, and swelling.

Assessment for trigger finger began with observing for triggering, followed by examining for the presence of swelling and tenderness at the A1 pulley, clicking, uneven movement, or locking of the finger, and range of motion of the affected finger(s). Trigger finger was graded using the modified Green's classification (Wolfe, 2011): Grade 1 (pretriggering)—pain; history of catching but not demonstrable on physical examination; tenderness over the A1 pulley; Grade II (active)—demonstrable catching, but the patient can actively extend the digit; and Grade III (passive)—demonstrable catching requiring passive extension (Grade IIIA) or inability to actively flex (Grade IIIB).

Assessment of carpal tunnel syndrome included frequency of numbness, tingling, and weakness, and examining for Tinel's sign, Phalen's sign, thumb opposition strength, and two-point discrimination. Phalen's sign was performed by holding the forearms with the elbow extended in supination and wrist in flexion. Thumb palmar abduction of the abductor pollicis brevis muscle was based on the Medical Research Council Scale for muscle strength, which uses a scale of 0–5, with 5 representing normal muscle strength and 0 for paralysis (James, 2007). Normal two-point discrimination is less than 5 mm (Buch-Jaeger & Foucher, 1994). We have previously described our methods of hand assessment (Leow, Lim, & Tay, 2017).

Data Analysis

The Statistical Package for the Social Sciences for Windows version 23 (SPSS Inc., Chicago, IL) was used. Descriptive statistics were used to describe participants' profiles and characteristics. Independent *t* test and Pearson's correlations were used to test for association between variables. A *p* value of less than .05 was used to determine whether the result was significant.

Ethical Considerations

Ethics approval was sought from the SingHealth's Centralised Review Institutional Review Board (CIRB Reference: 2016/2767). Participants were advised that their participation was voluntary, and verbal consent was obtained from all participants.

Results

Fifty-five elderly persons participated in the community hand assessment. The mean age was 74.0 ± 7.0 (range: 60–90) years, and the majority were female (n = 41, 74.5%). Demographics are presented in Table 1.

The time taken to assess each participant ranged from 10 to 20 minutes. A third of the elderly persons presented with a hand condition (n = 17, 30.8%), of whom 11 (20.0%) had osteoarthritis, one had trigger

Table 1. Demographic and Clinical Data ($N = 55$)

Demographic	*n* (%)
Age (years)	
Mean ± SD	74.0 ± 7.0
Range	60–90
Gender	
Male	14 (25.5)
Female	41 (74.5)
Race	
Chinese	51 (92.7)
Malay	4 (7.3)
Hand dominance	
Right	51 (92.7)
Left	4 (7.3)
Presence of hand condition	
No	38 (69.1)
Yes	17 (30.79)
Hand condition	
Osteoarthritis	11 (20.0)
Trigger finger	3 (5.5)
Carpal tunnel syndrome	5 (9.1)
Number of hands involved	
One hand	11 (64.7)
Two hands	6 (35.3)
Dominant hand involved	
No	1 (5.9)
Yes	16 (94.1)
Grip strength (kg)	
Dominant hand	
Mean ± SD	18.5 ± 6.0
Range	8–34
Nondominant hand	
Mean ± SD	17.2 ± 6.4
Range	7–42
Pinch strength (kg)	
Dominant hand	
Mean ± SD	5.5 ± 1.6
Range	3.0–10.0
Nondominant hand	
Mean ± SD	5.1 ± 1.5
[Range]	2.5–9.0
Quick disability, arm, shoulder, and hand (QuickDASH)	
Mean ± SD	12.7 ± 2.5
Range	11–21

finger (1.8%), three had carpal tunnel syndrome (5.5%), and two had concomitant trigger finger and carpal tunnel syndrome (3.6%). Eleven (20.0%) were affected in only one hand, and 10 (18.2%) were affected on the dominant hand. The mean QuickDASH score was 12.7 ± 2.5 (range: 11–21).

Table 2 summarizes factors associated with hand conditions. Participants with hand conditions were mostly female (39% in females, 7% in males; $\chi^2 = 4.97$, $p = .04$). Age was marginally significant ($t = -1.97$, $p = .05$). The grip strength ($t = 2.12$, $p = .04$) and the pinch strength ($t = 2.54$, $p = .003$) were lower in the dominant hand. However, there was no difference in grip strength ($t = 1.53$, $p = .13$) and the pinch strength ($t = 0.91$, $p = .37$) between those with and without a hand condition in the

Table 2. Factors Associated With Hand Condition

	No Hand Condition ($n = 38$)	With Hand Condition ($n = 17$)	
Age (years)			$t = -1.97$
Mean ± SD	72.8 ± 7.0	76.7 ± 6.4	$p = .05$
Range	60–87	67–90	
Gender			$\chi^2 = 4.97$
Male, *n* (%)	13 (34.2)	1 (5.9)	$p = .04$
Female, *n* (%)	25 (65.8)	16 (94.1)	
Race			$\chi^2 = 0.07$
Chinese *n* (%)	35 (92.1)	16 (94.1)	$p = 1.00$
Malay, *n* (%)	3 (7.9)	1 (5.9)	
Hand dominance			$\chi^2 = 0.74$
Right, *n* (%)	36 (94.7)	15 (88.2)	$p = .58$
Left, *n* (%)	2 (5.3)	2 (11.8)	
Grip strength (kg)			
Dominant hand			$t = 2.12$[a]
Mean ± SD	19.6 ± 5.7	16.1 ± 5.9	$p = .04$
Range	10–34	8–32	
Nondominant hand			$t = 1.53$
Mean ± SD	18.1 ± 6.1	15.2 ± 6.8	$p = .13$
Range	7–42	7–34	
Pinch strength (kg)			
Dominant hand			$t = 2.54$[a]
Mean ± SD	5.9 ± 1.8	4.7 ± 0.9	$p = .003$
Range	3.0–10.0	3.5–6.5	
Nondominant hand			$t = 0.91$
Mean ± SD	5.1 ± 1.6	4.8 ± 1.4	$p = .37$
Range	2.5–9.0	2.5–9.0	
Quick disability, arm, shoulder, and hand (QuickDASH)			$t = -4.61$
Mean ± SD	11.8 ± 1.5	14.7 ± 3.2	$p = .002$
Range	11–17	11–21	

[a]Equal variances not assumed.

nondominant hand. QuickDASH was reported to be higher (i.e., indicating more disability) in those with hand conditions ($t = -4.61, p = .002$). In the QuickDASH, most participants with hand conditions reported having difficulties doing heavy household chores (34.5%), opening a tight or new jar (21.8%), and partaking in recreational activities that take force or impact through the arm, shoulder, or hand (21.8%).

Description of Hand Condition, Symptoms, and Treatment

Four of the elderly persons with osteoarthritis reported no symptoms. Two of 11 (18%) with osteoarthritis, one of three (33%) with trigger finger, and four of five (80%) with carpal tunnel syndrome had previously sought treatment. In the two elderly persons with osteoarthritis, one was given analgesia and the other did not receive any treatment. One elderly person with trigger finger went for acupuncture. One elderly person with trigger finger previously consulted the doctor for the right thumb and was given corticosteroid injection. However, the symptoms recurred, and she subsequently also developed trigger finger on the right index finger, left thumb, and right finger. Three elderly persons with carpal tunnel syndrome had a previous carpal tunnel release but were still having symptoms of carpal tunnel syndrome. One elderly person is currently on follow-up with the doctor. One elderly person with carpal tunnel syndrome had previously sought acupuncture in addition to Western treatment.

Discussion

A significant proportion (30%) of the elderly persons in our study presented with abnormal findings from the hand assessment. This justifies the need for routine assessment. In our setting, there is currently no community-based screening program that includes hand assessment for elderly persons. A functional screening program that includes physical function, continence, mood, vision, hearing and oral health is currently being conducted for seniors aged 60 years and older (Health Promotion Board, 2015). It would be beneficial for an assessment of the hands to be included in the screening as reduced upper limb function can result in reduced ability to perform ADLs.

In this study, we advised the elderly persons to consult a doctor if any anomaly was detected. A doctor consultation was necessary for them to obtain a complete assessment and medical treatment. Clinically, osteoarthritis can be suspected when Bouchard's nodes or Heberden's nodes are observed (Swann, 2015). However, for a definite diagnosis of osteoarthritis of the hand, an x-ray report is necessary to provide radiological evidence of breakdown of cartilage between joints. Also, blood tests such as erythrocyte sediment rate, C-reactive protein, rheumatoid factor, and citrulline-modified proteins need to be performed to exclude rheumatoid arthritis. For carpal tunnel syndrome, a nerve conduction study can be performed to assess the severity of the condition.

This study found a significantly higher proportion of females with hand condition than males. Age was marginally significant. This is congruent with the literature, which reports that hand problems were significantly more common in females than in males and that the prevalence increased with age (Dziedzic et al., 2007). QuickDASH was higher (indicating more disability) in elderly persons with hand conditions, with most elderly persons reporting difficulties doing household chores. The impact on household chores could be significant as most of them were female. The grip and pinch strength of participants with hand conditions was found to be significantly decreased in the dominant hand, but no significant difference was found in the nondominant hand. This could be associated with the hand condition occurring more frequently on the dominant hand.

From our assessment, we found that 20% of the elderly persons had suspected osteoarthritis, of which 12.7% was symptomatic. The percentage of osteoarthritis picked up from our assessment was lower than the previous study that reported a prevalence of 44% based on radiographic diagnosis, but the prevalence of symptomatic osteoarthritis was similar (Haugen et al., 2011). This could suggest that based on reported symptoms and physical assessment, about half of the cases would be overlooked. Compared with other hand conditions, elderly persons with osteoarthritis presented with symptoms of the longest duration and had the lowest percentage for which medical attention was sought. This could be attributed to the common misconception that pain in the joints is part of aging and that nothing could be done (Kloppenburg, 2014). Community education targeting ways to prevent osteoarthritis and treatment to prevent exacerbation is called for.

Majority of the elderly persons with carpal tunnel syndrome had sought medical attention. This could be due to the more severe symptoms of carpal tunnel syndrome, such as numbness, which can significantly affect ADLs. Three of the five elderly persons with carpal tunnel syndrome had previously done a carpal tunnel release. However, all three still experienced numbness, and two had a two-point discrimination of greater than 8 mm, which was abnormal. A previous study found that 74% of patients had resolution of numbness postsurgery (Louie et al., 2013), even though the two-point discrimination was abnormal in 50% of patients (Katz et al., 1995). A recent study found that patients with mild or moderate carpal tunnel syndrome had quicker resolution of numbness than those with severe carpal tunnel syndrome (Fowler, Munsch, Huang, Hagberg, & Imbriglia, 2015). Patients with severe carpal tunnel syndrome probably require a longer time to achieve resolution of numbness or to become asymptomatic. In a recent long-term study, 72.5% of patients with bilateral severe carpal tunnel syndrome were asymptomatic at a mean follow-up of 9 years after carpal tunnel release (Tang et al., 2017).

One elderly person with trigger finger previously received corticosteroid injection. However, during the hand assessment, we found that it recurred, and symptoms of triggering were developing in other fingers (Grade 2). Recurrence of trigger finger after corticosteroid injection is common, and our previous study reported that 60% of patients eventually opted for surgery (Choudhury & Tay, 2014). In the event that corticosteroid injection fails, surgery might be required (Kamienski, 2013). Despite being aware of the symptoms of trigger

finger, particpants did not seek medical attention. This suggested that the elderly people sought medical attention only if the hand condition was severely affecting their daily lives.

Two elderly persons (11.8%) with hand conditions in the study sought acupuncture treatment—one was for trigger finger and one for carpal tunnel syndrome. A local study found that elderly people were likely to use complementary and alternative medicine over conventional Western medicine for the treatment of minor conditions such as sprains, back and joint aches, and chronic pain; 5.2% used acupuncture in a 12-month period (Lim, Sadarangani, Chan, & Heng, 2005). Hand conditions typically present with pain at the joints, prompting the use of acupuncture.

Implications for Practice

There is a need for general hand assessment in elderly persons to detect hand conditions and advise on regular follow-up for monitoring. Simple assessments such as using the QuickDASH, observing for swelling at the fingers, triggering, and testing for Tinel/Phalen's sign should be performed on annual physical examinations as well as in screening programs in community centers. This screening should be accompanied by community education focusing on healthy aging and management of what is perceived to be inevitable symptoms of aging. Discussing common signs and symptoms that include swelling or deformity of the fingers (osteoarthritis), finger locking (trigger finger), and having numbness and sensation of pins and needles (carpal tunnel syndrome) can increase awareness and facilitate access to earlier treatment. In addition, individuals can be provided with guidance on adaptive strategies that can be used in the presence of hand symptoms to perform daily activities that require good hand function.

Conclusion

This study highlighted the importance of active hand assessment for elderly populations in the community. Most elderly persons did not seek medical attention for their hand condition until it had a significant impact on their lives, which usually meant that it was in the late stages and might not be amenable to conservative treatment. Nurses can play an important role in providing community hand assessment and educating the elderly persons of symptoms, treatment, and adaptive approaches to maximize hand function.

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