Reliability and validity of the Hindi version of Falls Efficacy Scale – International (FES-I) among older adults in Alberta

by

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Abstract

Background: The Falls Efficacy Scale – International (FES–I) is a questionnaire developed to measure fear of falling by assessing an individual's confidence in performing basic and complex activities. The validity and reliability of the FES-I has been determined for various versions in different languages and across cultural settings. The aim of this study was to evaluate the reliability and validity of a Hindi version of the FES–I for use with older adults residing in Alberta, Canada. ***Methods:*** A sample of 23 Hindi speaking older adults, aged 60 years and older was recruited. Participants were administered the FES–I (Hindi) during a structured interview, along with the Berg Balance Scale (BBS) and Timed Up and Go test (TUG). To assess test-retest reliability the scale was administered again after approximately two weeks from the initial interview. Internal consistency and test-retest reliability of the scale was evaluated using Cronbach's alpha coefficient and Intra-class correlation coefficient, respectively. The FES–I (Hindi) was correlated with the functional measures (BBS and TUG) to examine construct validity using Spearman correlation coefficient. FESI-I (Hindi) scores of this study were compared to those of the original FES–I (English) study by age, gender, occupational status and history of falls. Independent t-test was used to compare differences in mean FES–I (Hindi) scores among participants of this study by the four demographic characteristics. ***Findings:*** The internal consistency and test-retest reliability of FES–I (Hindi) were significant: $\alpha = 0.831$ ($p = 0.000$) and ICC = 0.894 ($p = 0.000$) (95% CI = 0.768 – 0.954), respectively. Spearman`s correlation coefficients between FES–I (Hindi) and Berg Balance Scale (BBS), and between FES–I and Timed Up and Go test (TUG), were significant: $\rho = -0.827$ and $\rho = 0.691$ ($p < 0.0001$), respectively. There was significant difference in FES-I (Hindi) mean scores between participants by occupational status, $t(21) = -1.63$ ($p = 0.014$), however, differences by age, gender and history of falls were not statistically significant ($p > 0.05$). ***Conclusion:*** FES–I (Hindi) was a reliable and valid measure of fear of falling among Hindi speaking participants in this study.

Preface

This thesis is an original work by Pranshu Arora. The research study received ethics approval from the Human Research Ethics Board, University of Alberta, Project Name "Reliability and Validity of the Hindi version of the Falls Efficacy Scale – International (FES-I) among older adults in Alberta" on March 20, 2014. Study ID: Pro00044536

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Chapter One: Introduction and Literature Review

1.1 Introduction

Falls are common among the elderly population. A fall is defined as an event which brings person to rest on the ground or floor or other lower level in an unexpected manner (WHO - Global Report on Falls Prevention in Older Age, 2007). Approximately 30% - 50% of community dwelling older adults fall at least once a year (Lin, Wolf, Hwang, Gong, & Chen, 2007; Logghe et al., 2009; Scheffer, Schuurmans, Dijk, Hooft, & Rooij, 2007). In Canada, about one-third of the population of community-dwelling Canadian seniors, 65 years and older experience one fall each year (Public Health Agency of Canada, 2011).

Many factors are associated with the risk of falling. These include: 1) Physical dysfunction that contribute to impaired mobility, balance impairment, muscle weakness and deterioration in endurance, which make it difficult for individuals to participate in daily activities (Tinetti Claus, and Doucette, 1995; Todd & Skeleton, 2004); 2) Chronic conditions such as stroke, severe cardiovascular and pulmonary diseases, arthritis, Parkinson's disease, severe orthopedic conditions or the factors associated to diabetes, also contribute to risk of falls; 3) Behavioral factors including alcoholism and medications and psychosocial factors such as depression, loneliness, stress which can, make an individual dependent and isolated, further reducing one's ability to perform activity and tasks; 4) Visual and cognitive impairments which affect an individuals' ability to adapt in an environment, including poor orientation or vision that restrict an individuals' ability to clear an obstacle which is a risk for falling (Härlein, Dassen, Halfens, & Heinze, 2009; Public Health Agency of Canada, 2014); 5) Age and gender, i.e., falls are more frequent with increasing age and among older women

(Todd & Skeleton, 2004).

It has been observed that more than half of injuries are due to falls (Public Health Agency of Canada, 2011). With respect to seniors' injuries in Alberta over a decade from 2001 – 2010, falls were the main cause of deaths among older adults aged 75 years and older. By the year 2010, falls became the leading cause of most injury-related hospital admissions and injury-related emergency department visits in this population. In 2010 about 13,450 people were admitted to hospitals due to falls, i.e., 45% of all the hospital admissions in Alberta (Alberta Centre for Injury Control and Research, 2012). The consequences vary, with over 55% falls resulting in physical injury (Logghe et al., 2009), commonly fractures (Fletcher, Gutherie, Berg, & Hirdes, 2010; Lin et al., 2007; Logghe et al., 2009), more than 95% of hip fractures (Alberta Centre for Injury Control and Research, 2012) and, psychological trauma leading to fear of falling and activity avoidance (Fletcher et al., 2010, Lin et al., 2007; Logghe et al., 2010; Scheffer et al., 2007; Public Health Agency of Canada, 2005).

Fear of falling is a common consequence of falls (Tinetti, Richman, & Powell, 1990), which older adults with or without an injury can develop. It may even be seen in people who have not experienced falls. The literature depicts a wide range of prevalence of fear of falling, i.e., 20% to 85%, in community dwelling older adults. This wide range may be due to differences between demographic variables among samples, different measures to assess fear and activity levels (Fletcher et al., 2010; Van Haastregt et al., 2007; Ruggiero et al., 2009; Sattin, Easley, Wolf, Chen, & Kutner, 2005; Scheffer et al., 2007; Zijlstra, 2009). In order to prevent the debilitating consequences of falling, older adults develop fear which restrict them from participating in Activities of Daily Living (ADL) and make them isolated (Curcio,

Gomez, & Ortiz, 2009; Deshpande et al., 2008; Fletcher et al., 2010; Kempen et al., 2007; Sattin et al., 2005). This activity restriction further affects the physical and mental health of the older adults, which can make them dependent on others.

Fear is best described by Tinetti and Powell as "a lasting concern about falling that leads to an individual avoiding activity that he/she remains capable of performing." (Tinetti & Powell, 1993). This restriction of activity participation and associated fear of falling can become a downward trend which may result into deterioration of functional abilities, balance and consequently, the compromised quality of life (QOL) (Figure 1.1) (Curcio et al., 2009; Van Haastregt et al., 2007; Kwan, Tsang, Close, & Lord, 2013; Ruggiero et al., 2009; Ulus et al., 2012; Yardley et al., 2005).

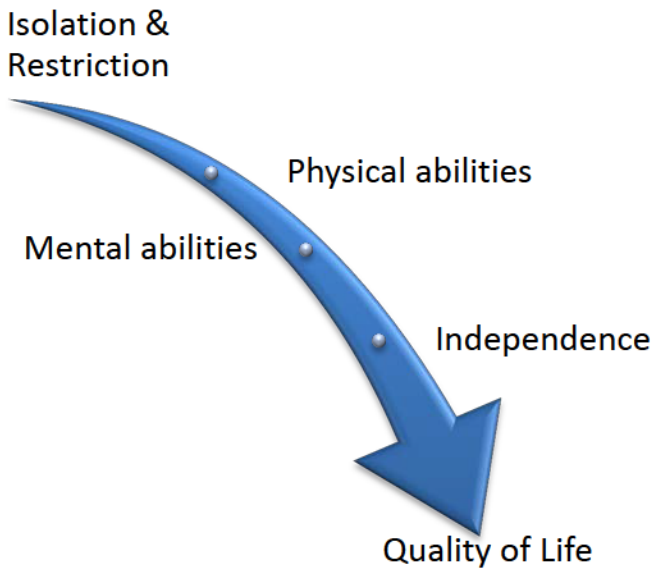

Figure 1.*Downward trend due to fear of falling*.

1.2 Literature Review

A search for literature on fear of falling, Falls Efficacy Scale (FES) and its modified versions was conducted using the databases: PubMed, MEDLINE and CINAHL using the search terms: Falls, Fear of Falling, Falls Efficacy Scale–International, Activity restriction, and Prevention of Falls Network Europe (ProFaNE). Articles were selected if they were available in English and were published within the last 30 years. Articles on the validation of the original FES–I into various languages were separated from those studies, which used the original FES–I as a tool with different populations (Delbaere et al., 2010; Hauer et al., 2010).

Measuring fear of falling: Before the development of the Falls Efficacy Scale, few approaches were known for assessing fear of falling. One approach was simply to ask individuals whether they are afraid of doing an activity, and another approach was to ask them about their feelings about specific situations (Tinetti et al., 1990). Such a single item questionnaire to assess fear of falling has been demonstrated in a few studies (Ulus et al., 2012; Yardley et al., 2005), however it does not discriminate different levels of fear, nor identify particular activities a client does with low confidence.

Falls Efficacy Scale (FES): The first scale developed for fear of falling was the 10-item assessment questionnaire named "Falls Efficacy Scale" (FES) (Tinetti et al., 1990) (see Appendix A). It was developed to assess older adults' confidence levels when performing daily activities. The authors validated the scale in three phases. The first phase involved the development of the instrument, where 10 randomly selected occupational therapists, physical therapists and nurses were asked to name 10 essential daily living activities which, according

to them, would be safe and nonhazardous for older adults. Subsequently, another group of 10 occupational therapists, physical therapists and nurses were asked if they agreed to the chosen activities, and a final list of activities was converted into the 10-item Falls Efficacy Scale. Each item was assessed on a 10 point continuum, with total scores ranging from 10-100. In the second phase, 18 subjects over 65 years of age from communities and intermediate care facilities were used to determine the test-retest reliability, where each subject was interviewed by a nurse using the 10-item Falls Efficacy Scale. Two questions were: "Are you afraid of falling?" and "Has fear of falling made you avoid any activity?" (Delbaere et al., 2010; Tinetti et al., 1990).

The same procedure was repeated by the same nurse after four to seven days from the initial interview. With significant test-retest reliability of the scale, (Pearson's correlation coefficient of 0.71) (Tinetti et al., 1990; Yardley et al., 2005) it was reported that 33% subjects who reported activity avoidance due to fear of falling had higher FES scores than those who did not report fear of falling. Higher scores are associated with higher fear of falling. The last phase examined the relationship between the FES scores and participants' self-reported fear, for which another 56 volunteer participants were assessed with FES, two questions related to fear of falling and the General Fear Survey, the Spielberger Trait Anxiety Inventory, and Depression Scale, physical assessment and a recent history of fall and injury. Multiple R^2 was 0.487, and it was reported that there was an independent association between FES scores and its predictors: anxiety trait and depression. Although the FES was reliable and valid for measuring fear of falling, there were some limitations. For example a smaller sample size and convenient sampling was used for the third phase of the study (Tinetti et al., 1990). In time, researchers suggested that this original FES could be improved as a measure of fear of falling

in many respects (Yardley et al., 2005). The items on the Falls Efficacy Scale pertain to only basic activities of daily living, which addresses only indoor activities and not outdoor activities that could be more demanding and complex. Also, outdoor activities could be the source of concern for the elderly population. The items in the original FES did not address the impact of fear of falling on social life or the consequences, like embarrassment because older adults avoid performing activities. Also the scale was developed in English and for used with the US population, so it was not necessarily applicable across different cultural contexts and different languages. In addition, the original FES's 10 point scale proved difficult for older adults to use.

Later, many scales were developed to examine the concept of falls efficacy. These included the Activities- specific Balance Confidence (ABC) scale, Modified Falls Efficacy Scale, and Survey of Activities and Fear of Falling in the Elderly (SAFFE). These addressed the limitations of the FES by either adding more items to the original FES scale or were new scales. But none of them proved better than the original FES because: 1) They contained a 10 point scoring system, which was already criticized; 2) They had items which were not applicable across different cultural settings; and 3) None of them had items which addresses the social impact of fear of falling.

Falls Efficacy Scale – International (FES–I): A modified version of the Falls Efficacy Scale was developed by Prevention of Falls Network Europe (ProFaNE) (Yardley et al., 2005), named Falls Efficacy Scale–International (FES-I) (see Appendix B). It comprises 16 items that address basic as well as complex activities. Ten items from the original Falls Efficacy Scale were included, and the other six items were selected with cross-cultural face

validity to assess more difficult activities: walking on a slippery surface, visiting friends or relatives, going to a place with crowds, walking on an uneven surface, walking up or down a slope and going out to an event. Unlike the 10-point scoring used for each item in the original FES, the modified version uses a 4-point scale (1 = not at all concerned, 2 = somewhat concerned, 3 = fairly concerned and 4 = very concerned) (Yardley et al., 2005).

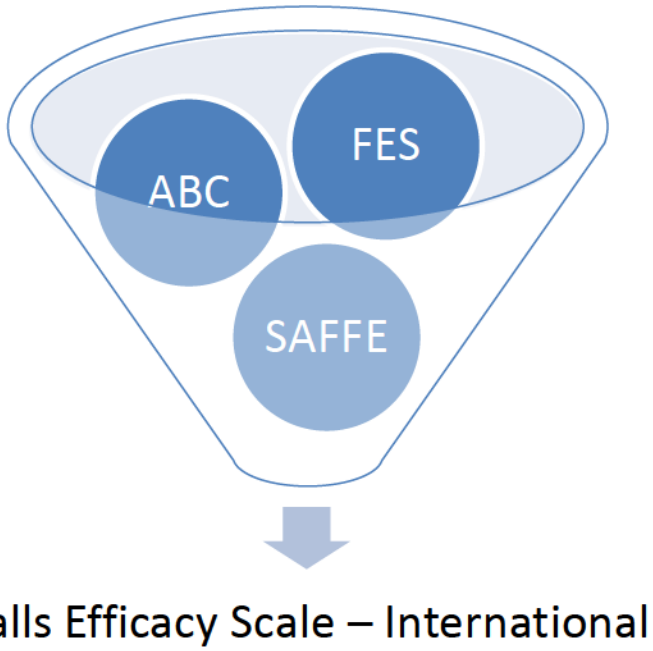

Figure 2.Establishment of Falls Efficacy Scale – International.

The FES–I was administered to a sample of 704 people over 60 years of age, by means of structured interview and postal survey. One of the limitations to the study was the recruitment of the participants, 76.4% (n=546) of the total sample were in managerial or professional occupations and 46.6% (n=328) of the sample reported no history of falls (Yardley et al., 2005). This sample likely produced less variability in the results than a sample

recruited from a more representative or randomly selected older adult population. A sample of 16 participants was re-administered with the FES–I after a week from the first assessment to examine test-retest reliability. Analysis of the internal reliability evaluated by Cronbach's alpha coefficient for the whole scale was 0.96 and statistically significant, as was for the test-retest reliability (ICC = 0.96, $p < 0.001$).

The FES-I is likely to perform better than FES in detecting the concerns related to complex activities and should prove useful for evaluating fear of falling in community dwelling older adults. Researchers from previous studies suggested demonstrating the reliability and validity of FES–I across various cultures and languages. Subsequently the, English version of FES–I has been translated into over 15 languages (Brazilian, Chinese, Danish, Dutch, French, German, Greek, Hindi, Norwegian, Punjabi, Spanish, Swedish, Swiss, French, Turkish and Urdu) (ProFaNE website) and more than half of these have been validated. It has been shown that the FES-I has strong reliability and validity across different cultures and languages, and has become a widely accepted tool for assessing fear of falling (Billis et al., 2011; Camargos, Dias R, Dias J & Freire, 2010; Kempen et al., 2007; Kempen et al., 2007; Lachman et al., 1998; Ruggiero et al., 2009; Yardley et al., 2005).

The strong reliability estimates, i.e., internal consistency and test-retest reliability (α = 0.96 and ICC = 0.96, respectively) of the FES-I, indicated that it could be shortened while preserving its psychometric properties. So, a shortened version of the sixteen items FES-I was suggested (Kempen et al., 2007).

Shortened FES–I: The shortened version of the sixteen items FES–I (Kempen et al., 2007) includes seven items from FES-I (see Appendix C). This is used for screening purposes or to give researchers and clinicians more options depending on their objectives related to falls. The selection of the seven items was done by combining the criteria of face validity and psychometric properties. The first criteria was that all items should discriminate between older adults reporting no falls, one fall, or more than one fall in the past year. Second, items must include a balanced range of activities that provoked low levels of fear in some people like walking on an uneven surface or slope and, those addressing social activities outside the home. The authors had two choices with sets of items: either a set of seven items or five items. They chose the set of seven items over a set of five items, because it had higher Cronbach's alpha coefficient (0.92) which is related to a larger number of items (Kempen et al., 2007).

The sample recruitment for the development of shortened version of the FES–I was not changed from the sample (704), which was recruited for the development of the FES–I. For the assessment of psychometric properties of the shortened version of the FES–I a random sample of 300, with age over 70 years was recruited from the Dutch population. For the assessment of reliability and validity of shortened version of the FES–I, both the original FES–I and the scale with four other variables associated with fear of falling to determine the discriminant validity, were administered to the Dutch sample of 300 people at two intervals with a gap of four weeks. The results of which were found to be significant - Spearman correlation coefficient for the shortened FES–I (two intervals) was 0.87 ($p < 0.05$), and for the FES–I was 0.97, whereas the Intra-class coefficient for the shortened version of the FES–I was 0.83 ($p < 0.05$). The results indicate that the shorter version of the FES–I has strong reliability and validity and would be appropriate to use for shorter assessments or screens (Kempen et al, 2007).

Validation across Europe: The FES–I has good psychometric properties within different settings and cultures of northern parts of Europe (Kempen et al, 2007). The FES-I demonstrates acceptable test-retest reliability and validity across countries such as Germany, the Netherlands and the UK (Kempen et al., 2007). Sample recruitment was done by advertising in senior journals and local senior organizations through mails and internet (Germany = 94), from local administration lists (Netherland = 193), and by advertising on internet and magazines (UK = 178). The authors administered the scale through postal survey, where in Germany and the Netherlands the administration of the scale was repeated after four weeks to study test-retest reliability. In addition to the scale, the authors included other variables and two questions: "During the past year, how often you have fallen over?" ('never', 'once', or 'twice or more') and "In general, are you afraid of falling over?" ('Not at all', 'a little', 'quite a bit', or 'very much'), in addition to demographic data. With respect to internal consistency, the Cronbach's alpha coefficient was calculated 0.90 (Germany), 0.96 (Netherland), 0.97 (UK) and the mean inter-item correlation of the sixteen item FES–I was 0.39, 0.64 and 0.65, respectively. The mean score of fear of falling in the first attempt was substantially lower in Germany (20.3), which may be due to the cultural differences towards fear of falling, as compared to almost similar scores in UK (28.2) and the Netherlands (28.4) (Kempen et al., 2007). Test-retest ICC coefficients for Germany and the Netherlands were significant at 0.79 and 0.82 ($p < 0.05$), respectively. Also, the results in Germany, the Netherlands and UK, showed that the FES–I scores were higher in older people and females as compared to younger people and males.

Turkish version of FES–I: Reliability and validity of the Turkish version of FES-I was assessed among 70 community dwelling older people, who knew Turkish and were aged over 65 years. To determine the convergent validity, the authors correlated the FES-I scores with the Berg Balance Scale (BBS) - which evaluates balance and postural control, the Timed Up and Go test (TUG) - which evaluates mobility and the Modified Barthel Index (MBI) - which evaluates level of disability with respect to activities of daily living. The FES-I scores were found to be negatively correlated with MBI total scores ($r = -0.622$, $p < 0.001$) and BBS scores ($r = -0.835$, $p < 0.001$) (low FES–I scores for better balance and functional independence) and positively correlated with TUG scores ($r = 0.743$, $p < 0.0001$) (low FES–I score for effective mobility). The Turkish version of FES–I was administered along with an assessment of the fear of falling, Functional Ambulation Category (FAC), Berg Balance Scale, Timed Up and Go test and Modified Barthel Index two times with an interval of two weeks in between, to study the test-retest reliability. Other psychometric properties (internal consistency and test-retest reliability) were evaluated using Cronbach's alpha as 0.94 and Intra-class correlation coefficient ranged from 0.97 to 0.99, respectively. Subsequently, test-retest correlation coefficients were assessed for the BBS = 0.98 ($p < 0.001$), for the TUG = 0.97 ($p < 0.001$) and, for the MBI = 0.99 ($p < 0.001$). It was found that the results for reliability and validity in the Turkish study were significant (Ulus et al., 2012).

Chinese version of FES–I: Kwan et al., (2013) not only recruited a sample from a local community in Hong Kong, China (n = 200) but also from Sydney, Australia (n = 199), to develop and validate the Chinese version of the FES-I. After the translation of the original FES–I (English) into Chinese, it was administered to the participants in face to face

interviews. Also, data was collected on socio-demographic, physical, medical and functional measures such as the Geriatric Depression Scale, the Lawton's Incidental Activities of Daily Living, the Timed Up-and-Go test and the Near Tandem Stand. Further, a re-assessment was done with 63 participants after two weeks to determine test-retest reliability of the FES-I (Chinese). In the second phase of the study, 31 of 63 participants were assessed by the same rater (to evaluate intra-rater reliability), whereas remaining 32 were assessed by a different rater (to evaluate inter- rater reliability).

Both the FES-I (Chinese) and Short FES-I (Chinese) have high internal consistency (Cronbach's alpha = 0.94 and 0.88, respectively) and test–retest reliability (ICC = 0.89 and 0.87, respectively, $p < 0.05$)), inter-rater reliability (ICC = 0.95 and 0.93, respectively, $p < 0.05$). The psychometric properties were found to be comparable to previously validated studies of the FES-I. Also, the study reported that FES–I scores were significantly higher in participants who had poor performance in Timed Up and Go and Near Tandem Stand. Women scored higher as compared to men who participated in the study. The spearman correlation coefficient was computed between FES–I (Chinese) and its shortened version, and the result was significant, 0.96 ($p < 0.001$). A limitation for the study was that the administration of the scale was in a structured interview format, so the results can be doubtful in the cases of people who were less educated. Also, the sample recruitment done in the study was comprised of healthy older adults instead of random selection from the elderly community.

Brazilian version of FES-I: A cultural adaptation of FES–I (Brazilian) was created using 163 community dwelling older adults who were 65 years and older and knew Brazilian. During the administration of FES–I (Brazilian), the information regarding history of

falls and demographics were collected from the participants. The FES–I (Brazilian) was administered again after approximately seven days to 58 participants. Internal consistency of FES–I (Brazilian) evaluated using Cronbach's alpha was found to be significant stronger (α = 0.93), similarly the test-retest reliability examined by same and different raters demonstrated a strong significance (ICC = 0.84 and ICC = 0.91, respectively). Factor analysis was used to examine the construct validity among the Brazilian population. The results showed homogeneity with the results of the original study, indicating a unitary factor with two different ranges of activities (basic and complex).

The authors also demonstrated an association between the FES–I and the outcome of falls in the previous year using a logistic regression model. It showed that older adults who scored between 23 and 31 on the FES–I would be identified as occasional fallers, whereas those with scores 31 and above, as frequent fallers. A potential limitation of the study was the recruitment of the sample, which was done using voluntary participants from the health centers and clinics. This convenient sample may have introduced a sampling bias. Also, the correlation of FES–I (Brazilian) to other measures with similar constructs was missing. Despite limitations, the scale was successfully adapted across settings in Brazil and it was found reliable for used among Brazilian population (Camargos et al., 2010).

Greek version of FES–I: A cross-cultural validation of the FES-I in Greek community dwelling older adults was done with 89 volunteers over 60 years of age. Participants in this study were tested against a few questionnaires: a falls related questionnaire, the Confidence in Maintaining Balance scale (CONFbal), the Short Form Survey (SF-36v2) and, the General Health Questionnaire (GHQ30). Also in order to find the

validity of the FES–I (Greek version), three functional tests were also conducted: Functional Reach Test, the Timed Up and Go test, and the Turn 180 test (TURN180). The Internal consistency (Cronbach's alpha = 0.92), and test-retest reliability (ICC=0.95, $p < 0.01$) were found to be significantly stronger. Construct validity against the functional tests was evaluated using Pearson's correlation, FRT (r = - 0.390, $p < 0.01$), TUG (r = 0.638, $p < 0.01$) and TURN180 (r = 0.416, $p < 0.01$). With respect to criterion-related validity, the study demonstrated a moderate association between FES–I and CONFbal and, the single fear of falling categorical question (r = 0.69 and r = 0.76, $p < 0.01$) respectively. Unlike, all other studies it was seen that men scored higher (worse performance) than the women in the Greek population. Lastly, two potential limitations were the convenient selection of sample and its smaller size (Billis et al., 2011).

Italian version of FES-I: Ruggiero et al., (2009) translated and validated the FES–I and its shortened version into the Italian language. The study recruited about 157 community dwelling older adults, who were over 65 years of age and admitted to the geriatric outpatient clinic. During the first administration, the participants were introduced to few standardized scales, i.e., ADL (activities of daily living), IADL (instrumental activities of daily living), TUG and GDS, apart from the Italian version of FES–I and short FES–I. To evaluate test-retest reliability 151 participants were re-administered the Italian versions of FES–I, after an interval of around four weeks. The statistics were analysed using mean-inter item correlations, Cronbach's alpha and Spearman`s correlation. The results were found to be significant as Cronbach`s alpha for FES–I (Italian) and short FES–I (Italian) at T1 were 0.97 and 0.94, respectively, and inter-item correlations were 0.74 and 0.75, respectively. The Spearman

correlation coefficient was computed between the FES–I (Italian) and its shortened version and results evaluated at baseline and follow up, T1 and T2 were strongly significant (T1 = 0.97, T2 = 0.98, $p < 0.0001$). The drawbacks to the study were believed to be the recruitment of the participants, which was limited to the group admitted to the hospital and the assignment of the scales to the participants, which was done randomly by the researcher in a gap of 2 – 3 hours. In addition, the correlation analysis between FES–I (Italian) and the standardized scales administered in the study (TUG, ADL and GDS) was not done. The study showed excellent reliability and internal validity results.

Norwegian version of FES–I: Helbostad et al., (2009) conducted a study to examine the psychometric properties of the Norwegian version of the sixteen-item FES-I and its shorter version in a sample of 672 fall-prone older home-dwelling adults aged more than 70 years. Inter-item correlation for both the scales was assessed using principle analysis with oblique rotation. The Cronbach's alpha coefficients for both 16-item and 7-item scales were reported as 0.95 and 0.89, respectively. Convergent validity was not examined. The study reported that their mean scores of FES-I were lower compared to the scores in the other studies like English, Dutch and German version of FES-I. It was interesting that even though the sample of Norwegian participants were prone to falling and were in contact with the health care system, they showed a better performance than sample participated in the English, Dutch and German study. Nevertheless, the Norwegian version of FES–I was reported to have good psychometric properties (Helbostad et al., 2009).

Hindi translation of FES–I: The Hindi translation of FES-I was done in 2010, but this was not published in the literature. According to the developers, the translation was done by a British born Indian and a researcher at Southampton University, and involved families who could understand both English and Hindi languages. The translation of Hindi version was performed among older people from the Hindi speaking community in England, and it was done by following the criteria defined in ProFaNEs' protocol. It was stated that for the survey they used the FES-I with minority ethnic groups, that is the Indian immigrants who could understand the Hindi in England. But interestingly, the majority of responders completed the English version of the FES-I even when they indicated they were from minority ethnic groups. As stated by the author, to date the Hindi version of the FES-I has not been validated with Hindi-speaking individuals.

Balance Confidence Scale (India): The Balance Confidence Scale was developed to address the confidence level among older adults in India. Sharma and D'souza (2008) developed a 22-item Balance Confidence Scale in English and translated it into, Hindi and Kannada.. Six older adults were interviewed to name those daily activities in which they lacked confidence because of poor balance. Apart from that, items of the existing scales which measure fear of falling were reviewed and decisively 19 items related to self-care, mobility, and transfers were constructed. Similar to Activities- specific Balance Confidence (ABC) scale, a 0 – 100% response system was chosen for the administration of Balance Confidence Scale (BCS). Further, the compiled set of items was reviewed by five experienced Occupational Therapists and with their opinion and suggestions three more items were added. The final version of the 22 items Balance Confidence Scale was developed and translated into

Hindi, and Kannada. For validation the scale was administered to 60 older adults, with a mean age of 74.3 years (SD = 6.9 years). The participants were divided into two groups of 30 participants with high and low mobility confidence level.

They were further correlated to analyze the construct validity of the Balance Confidence Scale (BCS). Independent t-test was used to determine the difference in balance confidence scores of two groups. In addition, the scale was re-administered on 15 participants after an interval of two weeks to determine its test-retest reliability. The test-retest reliability was found to be high (Pearson's r = 0.93, $p < 0.001$) and internal consistency also high (α = 0.97). To compare the methods of administration the scale was then re-administered to 15 participants via phone after an interval of 2 weeks. It was observed that the correlation between the scores of the face-to-face and phone methods was high (Pearson's r = 0.96 ($p <$ 0.001). Therefore, the phone administration could be considered equivalent to the face-to-face administration of this scale.

Psychometric properties

Reliability refers to the consistency or precision of an instrument. That is, if an instrument we are investigating is reliable, it will show similar results every time we use it assuming there is no change in the construct we are measuring. It is represented by the ratio of true score variance to observed score variance (true score variance + error in variance), which is known as the reliability coefficient. It is also represented in terms correlation, by which it reflects the correlation between the true scores and the observed scores. The common rule for the magnitude of reliability coefficient describes that the coefficient value below 0.5 is considered to be poor reliability, between 0.5 and 0.75 is moderate reliability and value more

than 0.75 depicts a stronger reliability (Portney & Watkins, 2000). The most common types of reliability used in research are: a) Test-retest reliability – which measures the consistency of an instrument across different times of administrations. It includes Intra-rater reliability (which concerns precision of scores by same rater across trials). b) Inter-rater reliability which measures the consistency of an instrument when administered by different raters. It concerns variation between different raters using the same instrument. c) Internal consistency which measures reliability of items within an instrument, that is, whether or not the items in the instrument examine the same construct.

2) The second psychometric property is validity, which is concerned about the accuracy of an instrument, or whether or not an instrument measures the qualities expected to get measured from that instrument. Validity of an instrument is associated with its internal structure, content, and its associations with other variables. Validity is expressed in different ways. a) Content validity – measures whether or not the items in an instrument or questionnaire represent the desired content. b) Criterion validity – measures whether or not the outcomes of an instrument or questionnaire is able to predict accurately and whether or not it can be considered as more efficient than the gold standardized instrument. c) Construct validity – measures whether or not the instrument or questionnaire is associated with measures of related constructs. Usually, the validity of an instrument is measured using the correlation coefficient such as Pearson's correlation coefficient or Spearman's correlation coefficient. The magnitude of correlation coefficient ranges between -1 and 1, an indication of the strength of relationships. Whereas, the sign (- or +) of coefficient indicates the direction of the relationship.

When compared, reliability is considered as the representation of test responses, whereas validity implicates the test scores. Despite, having different approaches, reliability and validity are associated with each other. That is, for a scale to be valid, it has to demonstrate reliability. But a reliable scale is not necessarily valid (Furr & Bacharach, 2014; Streiner & Norman, 2008; Portney & Watkins, 2000).

1.3 Rationale for the study

Falls Efficacy Scale–International, a measure of fear of falling that assesses the different levels of physical and social activities, has been translated and validated into over 15 languages, but it is yet to be validated for the Hindi language. According to the 2011 Census data of Canada, it was reported that there were 90,545 Hindi speakers in Canada. In 2011, there were 28,800 Albertans who spoke Hindi, out of which 5,460 were in Edmonton (Statistics of Canada, Census 2011; Government of Canada, 2013). With over a million health care staff in almost 200 health care centers and hospitals in Alberta, such validation of the FES-I (Hindi) could help address the language barrier for health care professionals in assessing fear of falling in Hindi-speaking older adults.

Validation of the FES-I (Hindi) would provide non-Hindi speaking health professionals with confidence in using the scale with Hindi speaking population in Canada. Finally, the scale could be used with Hindi populations in other countries, including India. At present, only one scale has been validated, Balance Confidence Scale to assess the fear of falling and confidence level among Hindi speaking population. In India, older adults can be dependent and have high risks of falling because of less developed infrastructures and poor accessibility. The FES–I (Hindi) seems more suitable than the Balance Confidence Scale in measuring fear

of falling among Hindi speaking population because: 1) It has less number of items, so would require less administration time, i.e., 16 comparisons to 22 items. 2) It has items which are suitable to every culture, so FES–I (Hindi) can be used in India as well as other countries. As the items of the Balance Confidence Scale were developed considering the cultural settings of the India, it can only be used within the boundaries of India and not in other countries (like western countries). 3) Items of the FES–I (Hindi) also address the social impact of fear of falling, which is missing in the Balance Confidence Scale. So, the use of Hindi version of FES–I to assess fear of falling would prove superior to the Hindi version of the Balance Confidence Scale (BCS) for use with Hindi speaking populations in developed and as well as in developing countries. Therefore, this study aims to validate the FES-I (Hindi version).

1.4 Research Questions

Research question 1: To determine whether the results of the Hindi version of the Falls Efficacy Scale–International are comparable with the scores of the original English version of the Fall Efficacy Scale-International, based on age, gender, history of falls and occupational status.

Research question 2: To determine the construct validity of the Hindi version of the Falls Efficacy Scale–International by correlating it with the "Berg Balance Scale" and the "Timed Up and Go test".

Research question 3: To determine test-retest reliability and internal consistency of the Hindi version of the Falls Efficacy Scale–International.

Chapter Two: Methods and Data analysis

2.1 Sample recruitment

The location for the recruitment was in Edmonton. Accordingly, the recruitment was done through advertisement (posters) in the Hindu Society of Alberta, two Gurudwaras (Sikh) and two Hindu temples across Edmonton. The study was advertised at the Millwoods Cultural Society of the Retired and Semi-retired, Edmonton, Alberta. Recruitment posters were prepared in both languages: English and Hindi (see Appendices J and K). Interested participants contacted the researcher at a University of Alberta lab telephone number, which was indicated on posters.

2.2 Sample size calculation

It was proposed that considering the power (1 - β) as 0.88, alpha level (α) as 0.05 and with an expected correlation coefficient value of 0.6 between the Falls Efficacy Scale – International (Hindi) and the Timed up and go test, and between the FES-I (Hindi) and the Berg Balance Scale. The study would need a sample size of 19 participants'[1]. Fortunately, it was possible to recruit a larger number of participants (n=23) for this study. Volunteers participated in the study from April 2014 to June 2014.

[1] https://www.statstodo.com/SSizCorr_Tab.php

2.3 Inclusion Criteria

The following inclusion criteria were used for the study:

1) Participants were included if they were 60 years or older. The age criteria was based on that used in previous studies with older adults for the Greek (Billis et al., 2011), Chinese (Kwan et al., 2013), and English versions (Yardley et al., 2005). 2) No significant cognitive impairment, i.e., Mini Mental Screening Examination (MMSE), score should be higher than 24 out of 30 (see Appendix E). The purpose of the screen was to help ensure that a participant was able to follow instructions of the study. If a participant scored less than 24, but at least more than 19 (mild cognitive impairment) and was able to follow instructions, he or she was allowed to enter in the study. 3) Able to understand and read Hindi. 4) No severe medical condition that could prevent a participant from performing tests, e.g., stroke, Parkinson's disease or severe cognitive or visual impairment. 5) Does not use artificial leg or prosthesis for mobility.

Once determined as meeting the inclusion criteria, the selected participants were introduced to the study by the investigator. An information sheet about the study, translated in Hindi, was provided to the participants. Also, a Hindi translated signed informed consent form was received from each recruited participant prior to administration of the FES-I (Hindi) scale (see Appendices H and I).

2.4 Procedures

During the first visit, the Falls Efficacy Scale–International (Hindi version) was administered in a face-to-face structured interview. Demographic data with information regarding age, gender, number of falls participants had in the past year, and their occupational status (working or not working) were collected. As impaired mobility and balance dysfunction

are major causes of falls, it was important that items in the FES–I (Hindi) have the qualities of these constructs. Therefore, two standardized tests commonly used in previous studies were selected and correlated with the items in the Hindi version of Falls Efficacy Scale–International. 1) The Timed Up and Go Test (Podsiadlo & Richardson, 1991) was used to measure basic mobility skills and, 2) the Berg Balance Scale (Berg, 1989) was used to examine postural adjustments an individual makes in response to his or her voluntary movements. All tests were administered at the participants' homes, except for two participants, who were evaluated at the Millwoods Cultural Society of the Retired and Semi-retired in Edmonton, Alberta. Each scale was translated into Hindi language for the participant's perusal, Berg Balance Scale (Hindi) (Appendix L) and Timed Up and Go (Hindi) (Appendix M).

For follow up, each participant was re-assessed approximately two weeks later using the FES-I (Hindi version). To minimize the chances of recall, a time interval of two weeks between first and the second administration of the scale has been recommended in the literature (Portney & Watkins, 2000). A similar time interval of two weeks was used in the FES–I studies of Chinese (Kwan et al., 2013) and Turkish (Ulus et al., 2012) versions.

A code book was developed with participants' anonymous code and demographic data information (name, age, address and phone number) and the codes which were assigned to them.

2.5 Measures

For research question 1, the FES-I, translated into Hindi language by Prevention of Falls Network Europe (ProFaNE) assesses a respondent's level of concern about falling when participating in 16 everyday life activities. Each item is scored on a four-point scale (1 = not at all concerned, 2 = somewhat concerned, 3 = fairly concerned and, 4 = very concerned) giving a summary score of 16–64 for the 16-item FES-I of which a low score indicates low concern of falling.

For research question 2, the Timed Up and Go Test (TUG) (see Appendix G) was used to evaluate mobility. The TUG is a balance and gait index which measures the time a patient takes to stand up from a chair, walk a 3 m distance, turn, walk back to the chair, and sit down. The time required to complete the task is measured in seconds. Time greater than 13.5 seconds indicates risk of falls among community dwelling older adults (Cook, Brauer, & Woollacott, 2000).

For research question 2, the Berg Balance Scale (see Appendix F) was used to evaluate balance. It is rated on a five-point ordinal scale (0 to 4) to score subjects performing 14 functional activities. A score of zero is given when patient is not able to do the task and a score 4 is given when a patient completes the task. The maximum score on the Berg Balance Scale is 56; a score below 40 indicates a fall risk of nearly 100% (Cook, Baldwin, Polissar & Gruber, 1997).

2.6 Ethical Considerations

The study received ethical approval from the Health Research Ethics Board (HREB), University of Alberta in March, 2014. Approval to use the FES-I (Hindi) for this study was received from ProFaNE in April, 2013. Information sheets were distributed to all the participants, which describe the procedures, benefits and minimal risks associated with this study. The participants were assured confidentiality related to their personal information. Signed informed consent was obtained from each participant.

2.7 Data Analysis

Data for this study was entered into and analyzed using statistical analysis software SPSS version 21. Descriptive statistics (age, gender, occupational status and history of falls) were used to characterize the sample who participated in this study. Independent t-tests were performed to determine the difference between FES–I (Hindi) scores by age, gender, occupational status and history of falls.

These variables were dichotomized as in the original English version of the FES-I (Yardley et al., 2005). The FES–I scores, were compared with the published norms of the English version (Table 2, page 617, Yardley et al, 2005). A 95% confidence interval for each category of variables in both studies, i.e., Hindi and English were calculated. To determine the relationship between the results of these studies (Hindi and English versions), the pattern of their (95% confidence interval) overlapping was observed.

Internal consistency for the Hindi version of FES-I was assessed using Cronbach's α coefficient. Test-retest reliability was assessed using intra-class correlation coefficient (ICC) between scores obtained in the first and follow-up administration.

Construct validity was assessed by evaluating Spearman correlation coefficient between the FES-I (Hindi version) and the Timed Up and Go Test and the Berg Balance Scale.

Chapter Three: Results

A total of 23 individuals participated in the study and all participants responded to the Hindi version of FES-I. The questionnaires were completed manually by the participants in the presence of the investigator. These data were then entered into a database in the statistical analysis software, SPSS version 21. The coding of the variables was reviewed and verified by the supervisor and investigator to ensure accuracy.

3.1 Participant demographics

More than half of the total participants in the present study were male. The mean age of all participants was 71.09 ± 6.29 (SD) years, with an age range of 60 – 88. The majority of the participants were retired or currently not working and most had 0 – 1 number of falls in the past year (Table 3.1).

Table 1.Frequency distribution of the participants (n = 23).

Variable	n (%)
Gender	
Male	15 (65.2)
Female	8 (34.8)
Occupational status	
Working	8 (34.8)
Not working	15 (65.2)
History/number of falls	
0	10 (43.5)
1	10 (43.5)
2	2 (8.7)
3	1 (4.3)

3.2 FES–I (Hindi) scores

Participants were asked to complete the Hindi version of FES–I twice in their homes with an interval of approximately two weeks. The overall mean score for the FES–I (Hindi version) was 22.39 ± 4.83 (SD), range = 16 – 64.

The mean scores of Hindi version of FES-I was reported by age, gender, occupational status and history or number of falls (Table 3.2). As with the original study of FES–I (English version), the variables were dichotomized. The categories were as follows, for age: less than 75 and more than 75; for gender: male and female; and for history of falls: none and at least 1or

more, except for occupational status: working and not working, where terminology used in the present study was not the same as in original study (Higher occupations and Lower occupations). It can be reported that it is the terminology which was different and not the criteria for grouping the participants into respective categories of occupational status.

Table 2FES–I (Hindi) scores of participants by age, gender, history/number of falls and occupational status.

Variable (n=23)	Mean (SD)
Age	
Less than 75	21.56(4.5)
75 or above	25.40 (5.1)
Gender	
Male	21.40(4.6)
Female	24.25 (4.9)
History/number of falls	
None	21.50(4.8)
At least 1 or more	23.08 (4.8)
Occupational status	
Working (higher occupations)	19.13 (2.8)
Not working (lower occupations)	24.13 (4.8)

Independent t-tests were performed to test the significance of the mean FES–I (Hindi) scores difference found between the categories of variables. This analysis showed that the Hindi FES–I score difference between the participants who were not working or were retired and those who were working was significant (t (21) = - 2.68, p = 0.014). Whereas, there was no statistically significant difference found between the Hindi FES–I scores by age (t (21) = - 1.63, p = 0.117), gender (t (21) = - 1.37, p = 0.184) and history of falls (t (21) = 0.76, p = 0.451).

3.3 Test-retest reliability and internal consistency

Intra-rater or test-retest reliability was tested using intra-class correlation coefficient (ICC). All 23 participants responded twice to the FES–I (Hindi) within an interval of two weeks, with the same rater. The ICC for the total scale score was 0.894 (95% CI = 0.768 – 0.954), indicating a strong reliability.

Internal consistency was tested using Cronbach's alpha was 0.831 (p = .000). This coefficient is used to examine if a scale consisting of several items measuring the same construct produce similar scores. The findings stated that the internal reliability of the FES–I (Hindi) was high.

3.4 Construct validity

Spearman's correlation coefficient was computed to assess the relationship between the total scores of FES–I (Hindi) and the Berg Balance Scale, the Timed Up and Go Test, to determine whether or not the fear of falling while performing daily activities is related to balance and mobility. The correlation ρ value requires both a magnitude and a direction of either positive or negative. As the Spearman's correlation coefficient was a positive (ρ) value between FES–I

(Hindi) scores and the Timed Up and Go Test, $\rho = 0.691$ ($p < 0.0001$), it implies that there is a direct relationship between the poorer performance in Timed Up and Go Test (high TUG score) and the higher fear of performing the activity (high FES–I score).

Whereas, for the Berg Balance Scale the Spearman's correlation coefficient was found to be a strong negative (ρ) value with Hindi FES–I scores, $\rho = -0.827$ ($p < 0.0001$). The negative sign here indicates that poorer balance (low BBS score) is inversely proportional to higher fear of performing a daily task (high FES–I score).

In summary, with a sample size of 23 Hindu speaking participants living in Alberta, the Hindu version of the FES-I demonstrated high inter-rater reliability, very good internal consistency and moderate to high construct validity when compared to the Timed Up and Go Test and the Berg Balance Scale, respectively.

Chapter Four: Discussion

To the best of our knowledge, the present study was the first validation study of the FES-I to measure fear of falling among Hindi speaking older adults, and the first study related to the FES–I done across Canada. The study was conducted with 23 participants, who all responded to the Hindi version of Falls Efficacy Scale–International. There were three objectives for this study. The first objective was to compare the results of present study with the norms of the original study of Falls Efficacy Scale–International (English version) on the basis of age, gender, history of falls and occupational status. The second objective was to determine the test-retest reliability and internal consistency of the Hindi version of Falls Efficacy Scale–International. And, last objective was to evaluate the construct validity of the Hindi version of the Falls Efficacy Scale-International by correlating it to the Berg Balance Scale and Timed up and go test.

4.1 Participant demographics

The demographic data showed that the participants had a wide range of age (60-88) and there were more male participants (65.2%). However, the mean age of the participants in the present study was (71.09 ± 6.29 (SD) years). It was observed that mean age of the present study was found one of the lowest when compared with other mean participant ages participated in previous studies using participants who were Greek (Billis et al., 2011), Brazilian (Camargos et al., 2010), European (Kempen et al., 2007, 2007), Chinese (Kwan et al., 2013), Italian version (Ruggiero et al., 2009); and the original English version (Yardley et al., 2005). There was an exception, the Turkish validation study (69.7 ± 4.59 (SD) years), where the participants were

younger than the sample of population in the present study (Ulus et al., 2012). By shifting our focus to history of falls reported by the participants in this study; what we found was more than half of the participants (56.5%) have reported falls in past one year. This may be due to the fact that they were residents of Alberta, Canada, where some falls can be attributed to environmental factors. Weather and climatic conditions, barriers within the communities, hazardous constructions of buildings, pathways and home hazards are some factors which increase the risk of falls (Public Health Agency of Canada, 2014). Also it can be noticed that for almost half a year the region of Alberta is covered with snow and ice and, which challenges pedestrians, especially the older adults.

Another objective was to examine FES–I (Hindi) scores by age, gender, history of falling and, occupational status. There were no statistically significant difference between mean FES–I (Hindi) scores by age, gender and history of falling. This may be explained by the age of the participants. As mentioned, the Hindi speaking population in this study was younger compared to the participants in the original English study. They may have been more homogeneous in abilities, therefore, there were no differences in performance based the demographic variables.

As stated, the FES–I (Hindi) scores were significantly different by occupational status. That is participants who were not working or were retired scored higher FES–I (Hindi) scores, as compared to the ones who were still working ($p < 0.05$). Interestingly, a similar trend was seen in the original study, where FES-I (English) scores were found significantly higher in the sample who were working in lower status occupations (Yardley et al., 2005). It may be argued that despite a different terminology used for the categories of occupation in both studies for example - in English (higher occupational status and lower occupational) and, in Hindi

(working and not working), a similarity was noticed. But it is the terminology which was different and not the criteria for grouping the participants into respective categories of occupational status. As participants in the lower occupational status group FES–I (English) had been in semi-routine occupations, low technical jobs or retired, this was considered similar to the participants in "not working" group of FES–I (Hindi) who were retired or not working. While the other group, higher occupational status in FES–I (English) had participants who were at higher managerial positions, were considered to be similar to the "working group" in FES–I (Hindi), where all participants are working. Nevertheless, the difference in terminology is a limitation in this study.

4.2 Comparison of mean FES–I scores (English and Hindi)

Before comparing the FES–I mean scores of both populations (English and Hindi), it is helpful to have a look at the number of participants (in both studies) who were grouped into different categories. As there is a large difference between sample size numbers of two studies, Hindi (23) and English (704), the number of participants is compared in terms of percentage. As discussed earlier the present study is dominated by males (65.2%), unlike the original study (Yardley et al., 2005) where there were more females (73.1%).In addition in this study, over $3/4^{th}$ (78.3%) were below 75 years of age whereas in the original study, about half (52.1%) were below 75 years of age. While looking at the history of participants who have experienced a fall, the percentage was almost similar in both studies: Hindi 56.5% and, English 53.1%. More than half of the participants in the Hindi study were in the group of retired or not working participants (65.3%), whereas the percentage of such participants was very low among the participants of original study (19.9%) (Yardley et al., 2005).

The mean scores of Hindi version of FES–I and the English version of FES–I were compared. Confidence Interval for both studies, within the categories of age, gender, history of falls and occupational status were evaluated. It was found that there was no overlap in the 95% confidence intervals of the variables: Age (less than 75 and more than 75), Gender (male and female), History of falls (none and more than 1) and Occupational status (working and not working) of both studies. There is evidence of a significant difference between the mean FES–I scores of both studies. In each category the mean FES–I (Hindi) scores were significantly lower than the scores of original study. The graphical representation of the results is provided in Appendix N. Therefore, it can be said that the characteristics of the Hindi speaking population are not comparable to those of the participants in the original English study.

An assessment of individual items in FES–I (Hindi) was done to interpret the cultural adaptations across the population participated in this study. The median score of each item responded by the participants of this study was evaluated. It was observed that most of the items in this FES–I (Hindi) have the median score of 1 (where scores were, 1 = not at all concerned, 2 = somewhat concerned, 3 = fairly concerned and, 4 = very concerned), except four items, which had the median score of 2. Therefore, it is assumed that across this cultural setting, the Hindi speaking older adults are somewhat concerned in these following activities: Item 9 – Reaching up and bending down, Item 11 – Walking on a slippery surface, Item 14 – Walking on an uneven surface and, Item 15 – Walking up or down a slope. It is possible that the participants of the present study is more physically active, and they might have better strength and balance compared to the sample participated in the original study, which in turn might mean that they were less fearful. So, this may be a reason the results of this study i.e., mean FES-I scores by

age, gender, history of falling and occupational status, were found to be statistically different than that of original study and they were not comparable.

4.3 Reliability

Test-retest reliability was examined using ICC (Intra-class correlation coefficient) by comparing the scores of FES–I (Hindi) administered twice at an interval of two weeks. Because of the time constraint, a single investigator administered all measures in this study. The studies that used the same time interval were the Turkish (Ulus et al., 2012) and Chinese versions (Kwan et al., 2013). In the present study, the ICC was calculated to be 0.89 with (95% confidence interval [CI] 0.76 -0.95). The FES–I (Hindi)'s test-retest reliability was statistically significant. However, the ICC value for this present study was higher than some of the other studies such as: Germany (ICC = 0.79), the Netherlands (ICC = 0.82), Brazil (ICC = 0.84), and Chinese (ICC = 0.89), but was lower than the original English FES–I (ICC = 0.96), Italy (ICC = 0.98), Greek (ICC = 0.95) and, the Turkish (ICC = 0.94). Similarly, the internal consistency for this present study was assessed using the Cronbach's alpha. The analysis revealed that the result for this study was significant ($\alpha = 0.83$), but lower than the other studies: original English FES–I ($\alpha = 0.96$), Germany ($\alpha = 0.90$), the Netherlands ($\alpha = 0.96$), UK ($\alpha = 0.97$), Turkish ($\alpha = 0.94$), Chinese ($\alpha = 0.94$), Greek ($\alpha = 0.92$), Italy ($\alpha = 0.98$), Brazil ($\alpha = 0.93$), and Norwegian ($\alpha = 0.95$).

4.4 Validity

Construct validity was assessed using the Spearman's correlation coefficient. Correlation was evaluated between the scores of FES–I (Hindi) and the performance in Berg Balance Scale and Timed Up and Go Test, to determine whether or not this falls efficacy scale has the constructs of balance and mobility. Studies have indicated that balance issues and instability in gait can make an individual fall and lead to fear of falling (Public Health Agency of Canada, 2014; Todd & Skeleton, 2004; WHO, 2007). The results demonstrated a low positive correlation, between Hindi FES–I scores and the Timed Up and Go test, as the Spearman's correlation coefficient for TUG was $\rho = 0.691$ ($p < 0.0001$). Indicating that the weaker performance in mobility (high TUG score) will lead to more fear of falling (high FES–I score). And, against Berg Balance Scale (BBS) a strong expected negative correlation was observed, as the Spearman's correlation coefficient for BBS was $\rho = -0.827$ ($p < 0.0001$). This indicates that good balance (high BBS) will decrease the fear of falling while doing activities (low FES–I score). As reported in the literature, there were some studies which also correlated their efficacy scales to the Timed Up and Go and Berg Balance Scale (Billis et al., 2011; Kwan et al., 2013; Ulus et al., 2012). Unlike this study, their results were evaluated using the Pearson's correlation, but they reported the same consistency as this present study, i.e., low Pearson's correlation (r) with Timed Up and Go and higher value of (r) with Berg Balance Scale.

Chapter Five: Conclusion

It can be concluded that the Hindi version of the Falls Efficacy Scale–International has good reliability and validity for use among Hindi speaking older adults living in Alberta, Canada. It can be used as a measure of fear of falling among Hindi speakers who are immigrants. The results of this study demonstrated that the participants of the study were not comparable to those who participated in the original English study. Except the history of falls, the two groups were different in distributions of age, gender and occupational status. The research showed that Hindi speaking older adults who were working performed better on the FES-I (Hindi) than those who were retired.

This validation would help FES-I (Hindi) to be used with Hindi speaking populations in different settings. Subsequently, this may contribute to occupational therapy practice and research among older adults.

5.1 Study limitations

In terms of the limitations, this present study was performed with a limited sample size of Hindi speaking older adults. This restriction of sample size restricts generalizability. Second, a convenience sample was recruited for this study, i.e., volunteers from the community. It may have been more desirable if the sample was selected from outpatients department or clinics, or if the sample would have included only individuals who have fallen in the past. It would have established more precise data on issues of falls and its associated fear of falling. Third, due to time constraints only the full version of FES–I (Hindi) was administered and not the shortened version. Therefore, the results cannot be generalized to the shortened version. Fourth, the

terminology for occupational status used in this study was not the same as used in the original study.

5.2 Implications for future research

It is suggested that in the future this study can be performed with a larger sample size, as well as in other regions of Canada. Also it would be interesting if a similar study is performed in India and the results are compared with the present study. Further, differences in adaptation of same (Hindi speaking) community residing in different cultural settings can be observed. As the present study was performed using a convenient sample, it is recommended that the future FES–I (Hindi) study is done with randomly selected participants who are using health services in the hospitals or clinics or who have experienced falls. Further, FES–I (Hindi) can be correlated to instruments that measures psychological performance (e.g., intelligence scale), to determine whether or not this scale has psychological constructs apart from balance and mobility (divergent validity). Lastly, after the validation of FES–I (Hindi), a validation study for its shortened version is recommended.

5.3 Implications for practice

The FES-I (Hindi) can help address communication gaps between health professionals and immigrant clients. The validated Hindi version of the Falls Efficacy Scale-International could be beneficial among practitioners who work with immigrants. It can be used by health professionals to assess falls efficacy among the older adults who can only speak and understand the Hindi language. The scale could be used in hospitals, clinics, rehabilitation centers and, the senior centers which focus on the safety concerns of the older population.

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APPENDICES

APPENDIX A: Falls Efficacy Scale

Falls Efficacy Scale

Name_____

Date_____

On a scale from 1 to 10, with *1 being very confident and 10 being not confident at all*, how confident are you that you do the following activities without falling?

Activity	Score 1 very confident 10 not confident at all
Take a bath or shower	
Reach into cabinets or closets	
Walk around the house	
Prepare meals not requiring carrying heavy or hot objects	
Get in and out of bed	
Answer the door or telephone	
Get in and out of a chair	
Getting dressed and undressed	
Personal grooming (i.e. washing your face)	
Getting on and off of the toilet	
Total Score	

A total score of greater than 70 indicates that the person has a fear of falling

Source: Tinetti, M., Richman, D., Powell, L. (1990). Falls Efficacy as a Measure of Fear of Falling. *Journal of Gerontology*. 45;239

FES-I

Now we would like to ask some questions about how concerned you are about the possibility of falling. Please reply thinking about how you usually do the activity. If you currently don't do the activity (e.g. if someone does your shopping for you), please answer to show whether you think you would be concerned about falling IF you did the activity. For each of the following activities, please tick the box which is closest to your own opinion to show how concerned you are that you might fall if you did this activity.

		Not at all concerned 1	*Somewhat concerned 2*	*Fairly concerned 3*	*Very concerned 4*
1	Cleaning the house (e.g. sweep, vacuum or dust)	*1* ☐	*2* ☐	*3* ☐	*4* ☐
2	Getting dressed or undressed	*1* ☐	*2* ☐	*3* ☐	*4* ☐
3	Preparing simple meals	*1* ☐	*2* ☐	*3* ☐	*4* ☐
4	Taking a bath or shower	*1* ☐	*2* ☐	*3* ☐	*4* ☐
5	Going to the shop	*1* ☐	*2* ☐	*3* ☐	*4* ☐
6	Getting in or out of a chair	*1* ☐	*2* ☐	*3* ☐	*4* ☐
7	Going up or down stairs	*1* ☐	*2* ☐	*3* ☐	*4* ☐
8	Walking around in the neighbourhood	*1* ☐	*2* ☐	*3* ☐	*4* ☐
9	Reaching for something above your head or on the ground	*1* ☐	*2* ☐	*3* ☐	*4* ☐
10	Going to answer the telephone before it stops ringing	*1* ☐	*2* ☐	*3* ☐	*4* ☐
11	Walking on a slippery surface (e.g. wet or icy)	*1* ☐	*2* ☐	*3* ☐	*4* ☐
12	Visiting a friend or relative	*1* ☐	*2* ☐	*3* ☐	*4* ☐
13	Walking in a place with crowds	*1* ☐	*2* ☐	*3* ☐	*4* ☐
14	Walking on an uneven surface (e.g. rocky ground, poorly maintained pavement)	*1* ☐	*2* ☐	*3* ☐	*4* ☐
15	Walking up or down a slope	*1* ☐	*2* ☐	*3* ☐	*4* ☐
16	Going out to a social event (e.g. religious service, family gathering or club meeting)	*1* ☐	*2* ☐	*3* ☐	*4* ☐

Short FES-I

Now we would like to ask some questions about how concerned you are about the possibility of falling. Please reply thinking about how you usually do the activity. If you currently don't do the activity, please answer to show whether you think you would be concerned about falling IF you did the activity. For each of the following activities, please tick the box which is closest to your own opinion to show how concerned you are that you might fall if you did this activity.

		Not at all concerned 1	*Somewhat concerned 2*	*Fairly concerned 3*	*Very concerned 4*
1	Getting dressed or undressed	*1* ☐	*2* ☐	*3* ☐	*4* ☐
2	Taking a bath or shower	*1* ☐	*2* ☐	*3* ☐	*4* ☐
3	Getting in or out of a chair	*1* ☐	*2* ☐	*3* ☐	*4* ☐
4	Going up or down stairs	*1* ☐	*2* ☐	*3* ☐	*4* ☐
5	Reaching for something above your head or on the ground	*1* ☐	*2* ☐	*3* ☐	*4* ☐
6	Walking up or down a slope	*1* ☐	*2* ☐	*3* ☐	*4* ☐
7	Going out to a social event (e.g. religious service, family gathering or club meeting)	*1* ☐	*2* ☐	*3* ☐	*4* ☐

गिर जाने के बारे में चिन्ताएं

अब हम आपसे इस बारे में कुछ प्रश्न पूछना चाहेंगे कि गिर पड़ने की संभावनाओं के बारे में आप कितने चिंतित हैं। निम्नलिखित में से प्रत्येक गतिविधि के बारे में, कृपया उस गतिविधि पर निशान लगाएं, जो आपकी अपनी चिन्ता, कि यदि आप यह गतिविधि करेंगे तो गिर सकते हैं, को बहुत ही नजदीकी से दर्शाता हो। यदि आप इस समय वह गतिविधि न भी करते हों (उदाहरण के लिए, आपके लिए आपकी खरीदारी कोई और करता हो) तब भी यह दिखाने के लिए कि क्या आप यह सोचकर चिंतित हैं कि यदि आप यह गतिविधि करेंगे तो गिर पड़ेंगे, कृपया जवाब दें।

		बिलकुल चिंतित नहीं	कुछ-कुछ चिंतित	साधारणत: चिंतित	बहुत चिंतित
1.	घर की सफाई (उदाहरण के लिए, झाड़ू लगाना, वैक्यूअम करना, झाड़-पोछ करना)	☐ 1	☐ 2	☐ 3	☐ 4
2.	कपड़े पहनना या उतारना	☐ 1	☐ 2	☐ 3	☐ 4
3.	साधारण भोजन तैयार करना	☐ 1	☐ 2	☐ 3	☐ 4
4.	स्नान या शॉवर लेना	☐ 1	☐ 2	☐ 3	☐ 4
5.	दुकान जाना	☐ 1	☐ 2	☐ 3	☐ 4
6.	कुर्सी पर बैठना या उससे उठना	☐ 1	☐ 2	☐ 3	☐ 4
7.	सीढ़ियां चढ़ना-उतरना	☐ 1	☐ 2	☐ 3	☐ 4
8.	पड़ोस में घूमना-फिरना	☐ 1	☐ 2	☐ 3	☐ 4
9.	अपने सिर के ऊपर या जमीन से कुछ उठाना	☐ 1	☐ 2	☐ 3	☐ 4
10.	टेलीफोन की घंटी बजने पर, घंटी रुकने से पहले उस तक पहुंचना	☐ 1	☐ 2	☐ 3	☐ 4
11.	फिसलन वाली सतह पर चलना (उदाहरण के लिए गीली या बर्फीली)	☐ 1	☐ 2	☐ 3	☐ 4
12.	किसी मित्र या संबंधी से मिलने जाना	☐ 1	☐ 2	☐ 3	☐ 4
13.	भीड़-भरे स्थानों में चलना	☐ 1	☐ 2	☐ 3	☐ 4
14.	ऊबड़-खाबड़ सतह पर चलना (उदाहरण के लिए, पथरीली जमीन, वे रास्ते जिनकी रख-रखाव अच्छी न हो)	☐ 1	☐ 2	☐ 3	☐ 4
15.	ढलान पर चढ़ना या उतरना	☐ 1	☐ 2	☐ 3	☐ 4
16.	किसी सामाजिक आयोजन में जाना (उदाहरण के लिए, धार्मिक सेवा, पारिवारिक सम्मेलन या क्लब की बैठक)	☐ 1	☐ 2	☐ 3	☐ 4

Berg Balance Scale

The Berg Balance Scale (BBS) was developed to measure balance among older people with impairment in balance function by assessing the performance of functional tasks. It is a valid instrument used for evaluation of the effectiveness of interventions and for quantitative descriptions of function in clinical practice and research. The BBS has been evaluated in several reliability studies. *A recent study of the BBS, which was completed in Finland, indicates that a change of eight (8) BBS points is required to reveal a genuine change in function between two assessments among older people who are dependent in ADL and living in residential care facilities.*

Description:
14-item scale designed to measure balance of the older adult in a clinical setting.

Equipment needed: Ruler, two standard chairs (one with arm rests, one without), footstool or step, stopwatch or wristwatch, 15 ft walkway

Completion:

Time: 15-20 minutes

Scoring: A five-point scale, ranging from 0-4. "0" indicates the lowest level of function and "4" the highest level of function. Total Score = 56

Interpretation:
41-56 = low fall risk
21-40 = medium fall risk
0 –20 = high fall risk

A change of 8 points is required to reveal a genuine change in function between 2 assessments.

Berg Balance Scale

Name: _____ Date: _____

Location: _____ Rater: _____

ITEM DESCRIPTION	SCORE (0-4)
Sitting to standing	_____
Standing unsupported	_____
Sitting unsupported	_____
Standing to sitting	_____
Transfers	_____
Standing with eyes closed	_____
Standing with feet together	_____
Reaching forward with outstretched arm	_____
Retrieving object from floor	_____
Turning to look behind	_____
Turning 360 degrees	_____
Placing alternate foot on stool	_____
Standing with one foot in front	_____
Standing on one foot	_____

Total _____

GENERAL INSTRUCTIONS

Please document each task and/or give instructions as written. When scoring, please record the lowest response category that applies for each item.

In most items, the subject is asked to maintain a given position for a specific time. Progressively more points are deducted if:

- the time or distance requirements are not met
- the subject's performance warrants supervision
- the subject touches an external support or receives assistance from the examiner

Subject should understand that they must maintain their balance while attempting the tasks. The choices of which leg to stand on or how far to reach are left to the subject. Poor judgment will adversely influence the performance and the scoring.

Equipment required for testing is a stopwatch or watch with a second hand, and a ruler or other indicator of 2, 5, and 10 inches. Chairs used during testing should be a reasonable height. Either a step or a stool of average step height may be used for item # 12.

Berg Balance Scale

SITTING TO STANDING
INSTRUCTIONS: Please stand up. Try not to use your hand for support.
( ) 4 able to stand without using hands and stabilize independently
( ) 3 able to stand independently using hands
( ) 2 able to stand using hands after several tries
( ) 1 needs minimal aid to stand or stabilize
( ) 0 needs moderate or maximal assist to stand

STANDING UNSUPPORTED
INSTRUCTIONS: Please stand for two minutes without holding on.
( ) 4 able to stand safely for 2 minutes
( ) 3 able to stand 2 minutes with supervision
( ) 2 able to stand 30 seconds unsupported
( ) 1 needs several tries to stand 30 seconds unsupported
( ) 0 unable to stand 30 seconds unsupported

If a subject is able to stand 2 minutes unsupported, score full points for sitting unsupported. Proceed to item #4.

SITTING WITH BACK UNSUPPORTED BUT FEET SUPPORTED ON FLOOR OR ON A STOOL
INSTRUCTIONS: Please sit with arms folded for 2 minutes.
( ) 4 able to sit safely and securely for 2 minutes
( ) 3 able to sit 2 minutes under supervision
( ) 2 able to able to sit 30 seconds
( ) 1 able to sit 10 seconds
( ) 0 unable to sit without support 10 seconds

STANDING TO SITTING
INSTRUCTIONS: Please sit down.
( ) 4 sits safely with minimal use of hands
( ) 3 controls descent by using hands
( ) 2 uses back of legs against chair to control descent
( ) 1 sits independently but has uncontrolled descent
( ) 0 needs assist to sit

TRANSFERS
INSTRUCTIONS: Arrange chair(s) for pivot transfer. Ask subject to transfer one way toward a seat with armrests and one way toward a seat without armrests. You may use two chairs (one with and one without armrests) or a bed and a chair.
( ) 4 able to transfer safely with minor use of hands
( ) 3 able to transfer safely definite need of hands
( ) 2 able to transfer with verbal cuing and/or supervision
( ) 1 needs one person to assist
( ) 0 needs two people to assist or supervise to be safe

STANDING UNSUPPORTED WITH EYES CLOSED
INSTRUCTIONS: Please close your eyes and stand still for 10 seconds.
( ) 4 able to stand 10 seconds safely
( ) 3 able to stand 10 seconds with supervision
( ) 2 able to stand 3 seconds
( ) 1 unable to keep eyes closed 3 seconds but stays safely
( ) 0 needs help to keep from falling

STANDING UNSUPPORTED WITH FEET TOGETHER
INSTRUCTIONS: Place your feet together and stand without holding on.
( ) 4 able to place feet together independently and stand 1 minute safely
( ) 3 able to place feet together independently and stand 1 minute with supervision
( ) 2 able to place feet together independently but unable to hold for 30 seconds
( ) 1 needs help to attain position but able to stand 15 seconds feet together
( ) 0 needs help to attain position and unable to hold for 15 seconds

Berg Balance Scale continued…

REACHING FORWARD WITH OUTSTRETCHED ARM WHILE STANDING
INSTRUCTIONS: Lift arm to 90 degrees. Stretch out your fingers and reach forward as far as you can. (Examiner places a ruler at the end of fingertips when arm is at 90 degrees. Fingers should not touch the ruler while reaching forward. The recorded measure is the distance forward that the fingers reach while the subject is in the most forward lean position. When possible, ask subject to use both arms when reaching to avoid rotation of the trunk.)
( ) 4 can reach forward confidently 25 cm (10 inches)
( ) 3 can reach forward 12 cm (5 inches)
( ) 2 can reach forward 5 cm (2 inches)
( ) 1 reaches forward but needs supervision
( ) 0 loses balance while trying/requires external support

PICK UP OBJECT FROM THE FLOOR FROM A STANDING POSITION
INSTRUCTIONS: Pick up the shoe/slipper, which is in front of your feet.
( ) 4 able to pick up slipper safely and easily
( ) 3 able to pick up slipper but needs supervision
( ) 2 unable to pick up but reaches 2-5 cm(1-2 inches) from slipper and keeps balance independently
( ) 1 unable to pick up and needs supervision while trying
( ) 0 unable to try/needs assist to keep from losing balance or falling

TURNING TO LOOK BEHIND OVER LEFT AND RIGHT SHOULDERS WHILE STANDING
INSTRUCTIONS: Turn to look directly behind you over toward the left shoulder. Repeat to the right. (Examiner may pick an object to look at directly behind the subject to encourage a better twist turn.)
( ) 4 looks behind from both sides and weight shifts well
( ) 3 looks behind one side only other side shows less weight shift
( ) 2 turns sideways only but maintains balance
( ) 1 needs supervision when turning
( ) 0 needs assist to keep from losing balance or falling

TURN 360 DEGREES
INSTRUCTIONS: Turn completely around in a full circle. Pause. Then turn a full circle in the other direction.
( ) 4 able to turn 360 degrees safely in 4 seconds or less
( ) 3 able to turn 360 degrees safely one side only 4 seconds or less
( ) 2 able to turn 360 degrees safely but slowly
( ) 1 needs close supervision or verbal cuing
( ) 0 needs assistance while turning

PLACE ALTERNATE FOOT ON STEP OR STOOL WHILE STANDING UNSUPPORTED
INSTRUCTIONS: Place each foot alternately on the step/stool. Continue until each foot has touched the step/stool four times.
( ) 4 able to stand independently and safely and complete 8 steps in 20 seconds
( ) 3 able to stand independently and complete 8 steps in > 20 seconds
( ) 2 able to complete 4 steps without aid with supervision
( ) 1 able to complete > 2 steps needs minimal assist
( ) 0 needs assistance to keep from falling/unable to try

STANDING UNSUPPORTED ONE FOOT IN FRONT
INSTRUCTIONS: (DEMONSTRATE TO SUBJECT) Place one foot directly in front of the other. If you feel that you cannot place your foot directly in front, try to step far enough ahead that the heel of your forward foot is ahead of the toes of the other foot. (To score 3 points, the length of the step should exceed the length of the other foot and the width of the stance should approximate the subject's normal stride width.)
( ) 4 able to place foot tandem independently and hold 30 seconds
( ) 3 able to place foot ahead independently and hold 30 seconds
( ) 2 able to take small step independently and hold 30 seconds
( ) 1 needs help to step but can hold 15 seconds
( ) 0 loses balance while stepping or standing

STANDING ON ONE LEG
INSTRUCTIONS: Stand on one leg as long as you can without holding on.
( ) 4 able to lift leg independently and hold > 10 seconds
( ) 3 able to lift leg independently and hold 5-10 seconds
( ) 2 able to lift leg independently and hold ≥ 3 seconds
( ) 1 tries to lift leg unable to hold 3 seconds but remains standing independently.
( ) 0 unable to try of needs assist to prevent fall

( ) TOTAL SCORE (Maximum = 56)

Timed Up and Go Instructions

General Information (derived from Podsiadlo and Richardson, 1991):

- The patient should sit on a standard armchair, placing his/her back against the chair and resting his/her arms chair's arms. Any assistive device used for walking should be nearby.
- Regular footwear and customary walking aids should be used.
- The patient should walk to a line that is 3 meters (9.8 feet) away, turn around at the line, walk back to the chair, and sit down.
- The test ends when the patient's buttocks touch the seat.
- Patients should be instructed to use a comfortable and safe walking speed.
- A stopwatch should be used to time the test (in seconds).

Set-up:

- Measure and mark a 3 meter (9.8 feet) walkway
- Place a standard height chair (seat height 46cm, arm height 67cm) at the beginning of the walkway

Patient Instructions (derived from Podsiadlo and Richardson, 1991):

- Instruct the patient to sit on the chair and place his/her back against the chair and rest his/her arms chair's arms.
- The upper extremities should not be on the assistive device (if used for walking), but it should be nearby.
- Demonstrate the test to the patient.
- When the patient is ready, say "Go"
- The stopwatch should start when you say go, and should be stopped with the patient's buttocks touch the seat.

Timed Up and Go Testing Form

Name:_____

Assistive Device and/or Bracing Used:_____

Date:_____

TUG Time:_____

Date:_____

TUG Time:_____

Date:_____

TUG Time:_____

Date:_____

TUG Time:_____

Date:_____

TUG Time:_____

सूचना पत्र

अध्ययन शीर्षक: कनाडा में उपयोग के लिए (एफ ई एस- आई) फॉल्स एफिकॅसी स्केल - इंटरनॅशनल के हिंदी संस्करण की वैधता और विश्वसनीयता ।

सुपरवाइज़र: डा0 लिली लियू, अध्यक्ष और प्रोफेसर, ऑक्यूपेशनल थेरेपी विभाग, कॉर्बेट हॉल, अलबर्टा विश्वविद्यालय, एडमंटन, ए बी, कनाडा-T6G2G4

अनुसंधान अन्वेषक: प्रांशु अरोड़ा (छात्र), पुनर्वास चिकित्सा – ऑक्यूपेशनल थेरेपी, कॉर्बेट हॉल, अलबर्टा विश्वविद्यालय, एडमंटन, ए बी, कनाडा – T6G2G4

पृष्ठभूमि: फॉल्स एफिकॅसी स्केल - इंटरनॅशनल (एफ-इ-एस - आई) एक 16 प्रशनों की प्रश्नावली है । जिसका विकास प्रतिवादी द्वारा दैनिक गतिविधियों के प्रदर्शन का मूल्यांकन करने से, गिरने के डर को मापने के लिए विकसित किया गया था । एफ-इ-एस- आई के पैमाने अलग -अलग भाषाओं और सांस्कृतिक रुप में जाँचे गये है, लेकिन हिंदी भाषा में नहीं। इस अध्ययन का मुखय उद्देश्य (एफ-इ-एस-आई) के पैमाने को हिन्दी भाषा में उपलब्ध करवाना है ताकि अल्बर्टा, कनाडा में रहने वाले वरिष्ठ लोगों द्वारा इसका उपयोग किया जा सके ।

उद्देश्य: फॉल्स एफिकॅसी स्केल - इंटरनॅशनल के हिंदी संस्करण की मान्यता कनाडा में हिन्दी बोलने वाली जनसंख्या के साथ उपयोग हो सकेगा । और, स्वास्थ्य पेशेवरों के लिए आत्मविश्वास प्रदान करेगा, साथ ही, गैर हिन्दी भाषी चिकित्सक भी हिन्दी बोलने वाले रोगियों के साथ इस स्केल का प्रयोग करके भाषा बाधा को कर स्केंगे। अंत में, बड़े पैमाने पर भारत सहित ओर देशों में भी हिन्दी बोलने वालों के साथ इस स्केल का उपयोग किया जा सकता है।

अध्ययन प्रक्रिया: फॉल्स एफिकॅसी स्केल - इंटरनॅशनल का हिंदी संस्करण, आपके स्थान पर ही श्री प्रांशु अरोड़ा (अनुसंधान अन्वेषक) द्वारा साक्षात्कार किया जाएगा । इस साक्षात्कार में आपके आगे दो प्रशनावली रखी जाएँगी, जैसे की एक फॉल्स एफिकॅसी स्केल - इंटरनॅशनल (एफईएस - आइ) और मिनी मेंटल सक्रीनिंग एग्ज़ॅमिनेशन (एमएमएसई - 2) का हिन्दी रूपान्तर । इसके अलावा, आपके दो साधारण परीक्षण, बर्ग बॅलेन्स स्केल (बीबीएस) और टाइम्ड-उप-एंड-गो टेस्ट (टीयूजी) द्वारा जांच की जाएगी जिनका संबंध आपकी रोजमर्रा की गतिविधियों के आधार पर होगा। प्रारंभिक साक्षात्कार से दो सप्ताह के बाद 16 आइटम प्रश्नावली के बारे में फिर से साक्षात्कार किया जाएगा ।

<u>मिनी मेंटल सक्रीनिंग एग्जॅमिनेशन (एमएमएसई - 2):</u> यह एक 11 प्रशनो के प्रसनवली है। जिससे व्यक्ति के संज्ञानात्मक गुण में बदलाव को जाँचा जाता है। इस परीक्षण का अधिकतम स्कोर 30 है। इस परीक्षण को पूरा करने के लिए 10-15 मिनट लगते है।

<u>फॉल्स एफिकॅसी स्केल: इंटरनॅशनल (एफईएस - आइ):</u> हिन्दी भाषा में अनुवादित यह 16 आइटम वाली प्रश्नावली है। जिसमे दैनिक गतिविधियों को करने मे प्रतिवादी में भय और आत्मविश्वास के प्रदर्शन का स्तर जाँचा जाता है । प्रत्येक मद को एक से चार की सूत्री के पैमाने पर अंक दिए जाते है (1 = बिलकुल चिंतित नहीं होना से 4 = बहुत चिंतित होना)। इस परीक्षण में 16-64 तक के अंको का विवरण दिया जाएगा। इस परीक्षण को पूरा करने के लिए 10-15 मिनट लगते है।

<u>टाइम्ड-उप-एंड-गो टेस्ट (टीयूजी):</u> इस परीक्षण में मरीज को कुर्सी से खड़े होकर एक बारी में 3 मीटर दूरी चलना होता है, फिर मुड़कर वापिस कुर्सी तक आना होता है और बॅठना होता है। किसी भी कार्य को पूरा करने में लगने वाले समय को पूरा करने के लिए आवश्यक समय सेकंड में मापा जाता है। इस परीक्षण को पूरा करने के लिए 5-10 मिनट लगते है।

<u>बर्ग बॅलेन्स स्केल (बीबीएस):</u> यह परीक्षण संतुलन का मूल्यांकन करने के लिए किया जाता है। प्रतिवादीओ के 14 कार्यात्मक गतिविधियों के प्रदर्शन के आधार पर एक पांच सूत्री (0-4) के पैमाने पर अंक दिए जाते है। रोगी कार्य करने में सक्षम अगर होनहीं हो, 0 स्कोर दिया जाता है और एक रोगी के कार्य पूरा होने पर 4 अंक का स्कोर दिया जाता है। बीबीएस पर अधिकतम स्कोर 56 है। इस परीक्षण को पूरा करने के लिए 15-20 मिनट लगते है।

<u>लाभ</u>: ऐसा नहीं है कि इस अध्ययन से आपको प्रत्यक्ष लाभ होगा लेकिन इस स्केल का उपयोग उन विभिन देशो में किया जा सकता है जहा हिंदी बोलने वाले लोगो के बीच गिरने के डर का आकलन करने में स्वास्थ्य व्यवसायीको को कठिनाई आती है । तथा साथ ही साथ भारत में इसका उपयोग किया जा सकता है। इसमें भाग लेने का यह भी लाभ है कि आप इसके अलावा अपनी मूल भाषा का उपयोग इस चिकित्सीय उपकरण को सत्यापित करने के लिए कर सकते और आप मदद करने पर गर्व महसूस कर सकते हैं। इस अध्ययन में भाग लेने के लिए कोई भी कीमत नहीं है।

<u>जोखिम</u>: भागीदारी का खतरा कम है चूँकि आकलन सरल हैं और अपने घर में आराम से शीघ्रता से जवाब देने के लिए है। (टीयूजी) या (बीबीएस) आपकी दैनिक गतिविधियों पर आधारित हैं अतः आपके द्वारा आपकी रोजमर्रा की जिंदगी में आने वाले शारीरिक जोखिम उन लोगों की तुलना में अधिक नहीं होंगे। फॉल्स एफिकॅसी स्केल इंटरनेशनल (हिंदी संस्करण) का प्रशासन आपकी सामान्य दैनिक देखभाल गतिविधियों के मूल्यांकन के लिए एक प्रश्नावली है।

<u>स्वैच्छिक भागीदारी</u>: यह आपका निर्णय है कि आप इस अध्ययन में भाग ले या नहीं। आप इस अध्ययन में शामिल होने के लिए स्वयंसेवक हैं, तो आप परिणामों के किसी भी प्रकार के बिना किसी भी समय बाहर निकल सकते है । और अगर आप किसी भी सवाल का जवाब नहीं देना चाहते, आप इंकार कर सकते है। किसी भी समय अध्ययन से बाहर निकालने का कोई जुर्माना नहीं लिया जाएगा।

<u>गोपनीयता और गुमनामी</u>: आपका नाम, लिंग, उम्र, पता और टेलीफोन नंबर साक्षात्कार आयोजित करने के लिए लिया जाएगा। यह जानकारी गोपनीय रहेगी और केवल आपकी अनुमति के साथ या कानूनी अपेक्षानुसार ही दी जायेगी। आपकी गोपनीयता केवल श्री प्रांशु अरोड़ा और डॉ. लिलि लियू द्वारा कोड का उपयोग करके ही की जायेगी, और मास्टर सूची में हस्तारक्षित सूचित सहमति, सूची फार्म के साथ एक बंद कैबिनेट में अलग रख दी जायेगी। हम इस अध्ययन से प्राप्त किसी भी सूचना में तथा अनुसंधान रिपोर्टो में आपके नाम का प्रयोग नहीं करेंगे। अध्ययन के एक बार पूरा हो जाने के बाद आपसे सम्बद्ध सूचना को समाप्त कर दिया जायेगा तथा साक्षात्कार के बाद अध्ययन के विश्लेषण में एकत्र आंकड़ों को छोड़कर आप और कोडिंग से संबंधित जानकारी को नष्ट कर दिया जाएगा। प्रकाशन हेतु हमारे द्वारा उपयोग की जाने वाली किसी भी जानकारी से आपकी व्यक्तिगत रूप से पहचान नहीं होगी।

<u>अन्य जानकारी</u>:

अलबर्टा विश्वविद्यालय स्तिथ रिसर्च एथिक्स बोर्ड द्वारा जारी नैतिक दिशा निर्देशों के अनुपालन करने हेतु इस अध्ययन की योजना बनाई गई है। शोध से सम्बद्ध अधिकारो और अनुसंधान के नैतिक आचरण के बारे में प्रश्नों के लिए, रिसर्च आचार कार्यालय से (780) 492-2615 पर संपर्क करें।

सहमति फार्म

भाग 1

अध्ययन शीर्षक: कनाडा में उपयोग के लिए (एफ ई एस- आई) फॉल्स एफिकॅसी स्केल - इंटरनॅशनल के हिंदी संस्करण की वैधता और विश्वसनीयता ।

सुपरवाइज़र: डा0 लिली लियू, अध्यक्ष और प्रोफेसर, ऑक्यूपेशनल थेरेपी विभाग, कॉर्बेट हॉल, अलबर्टा विश्वविद्यालय, एडमंटन, ए बी, कनाडा-T6G2G4

अनुसंधान अन्वेषक: प्रांशु अरोड़ा (छात्र), पुनर्वास चिकित्सा – ऑक्यूपेशनल थेरेपी, कॉर्बेट हॉल, अलबर्टा विश्वविद्यालय, एडमंटन, ए बी, कनाडा – T6G2G4

भाग 2	हाँ	नहीं
क्या तुम समझते हो कि तुम एक शोध अध्ययन में होने को कहा गया है?	□	□
क्या तुमने पढ़ा और अनुलग्न की गई सूचना शीट की एक प्रतिलिपि प्राप्त की?	□	□
क्या आप लाभ और इस शोध अध्ययन में भाग लेने में शामिल जोखिम समझते है?	□	□
क्या आप जानते है, आपके द्वारा दी गयी जानकारी किसके पहुँच में रहेगी?	□	□
क्या आपको सवाल पूछने और इस अध्ययन के बारे में बात करने का अवसर मिला?	□	□
क्या आप समझते है की आप किसी भी समय, बिना कोई जुर्माने के इस अध्ययन से बाहर निकल सकते है?	□	□
गोपनीयता के मुद्दों के लिए आपको समझाया गया है?	□	□

इस अध्ययन के बारे में किस व्यक्ति ने आपको
समझाया?_____

मैं दो साक्षात्कार में भाग लेने के लिए सहमत हूँ: YES □ NO □

शोध प्रतिभागी के हस्ताक्षर: _____

(नाम): _____

दिनांक (D/M/Y): _____

गवाह के हस्ताक्षर: _____

मुझे विश्वास है कि इस फॉर्म पर हस्ताक्षर करने वाले व्यक्ति समझता है की, अध्ययन में क्या शामिल है और स्वेच्छा से भाग लेने के लिए सहमत है ।

अन्वेषक के हस्ताक्षर _____

दिनांक (D/M/Y): _____

STUDY INFORMATION SHEET

Study Title: Reliability and validity of the Hindi version of the Falls Efficacy Scale–International (FES-I) for use in Canada.

Supervisor: Lili Liu, PhD, Professor and Chair, Department of Occupational Therapy, Faculty of Rehabilitation Medicine, University of Alberta, Edmonton, AB
Email: lili.liu@ualberta.ca

Research Investigator: Pranshu Arora (student), Faculty of Rehabilitation Medicine, Corbett Hall, University of Alberta, Edmonton, AB**, Phone (780) 807-1490, Email: parora@ualberta.ca**

Background: The Falls Efficacy Scale–International (FES–I) is a set of 16 questions. It helps to measure fear of falling on basis of daily performances by the respondent. The FES-I scale has been used in different languages and cultures, but not in the Hindi language. The aim of this study is to validate the FES–I in Hindi language, for use among older adults living in Alberta, Canada.

Purpose: Validation of FES-I (Hindi version) would give support to health professionals. They would use it with Hindi speaking population in Canada. As well, non-Hindi speaking therapists would use this scale with Hindi-speaking patients. It can help overcome language barrier. Finally, the scale could be used with Hindi populations in other countries, including India.

Study Procedures: You will be interviewed by the researcher, Mr. Pranshu Arora in your home. The interview will be done at a time that is convenient for you. You will complete the Hindi version of a cognitive test called the Mini-Mental Screening Examination (MMSE-2), the Falls Efficacy Scale (FES-I), and the two other tests – the Berg Balance Scale (BBS), and the Timed-up-and-go Test (TUG). All tests will be presented in the Hindi language.

Mini-Mental Status Examination-2: This is an 11 item test. It helps to record the cognitive changes over a time. It would be a standard version of 11 simple questions. Scoring for this test would be done out of 30. This test takes 10-15 minutes to finish.

Falls Efficacy Scale – International (FES – I): This 16-item questionnaire measures the level of fear and confidence of a person in performing daily activities. Each item is scored on a four-point scale where, (1 = not at all concerned to 4 = very concerned). This questionnaire takes 10-15 minutes to finish. This is the only questionnaire that you will complete again two weeks after the first interview.

The Timed Up and Go test (TUG): The TUG measures the time you take to stand up from a chair, walk a 3 m distance, and turn. You will walk back to the chair, and sit down. This test takes 5-10 minutes to finish.

Berg Balance Scale (BBS): This scale measures your performance on 14 activities. It uses a five-point scale (0 to 4): zero if you cannot do the task and 4 if you can complete the task. This test takes 15-20 minutes to finish

Benefits: It is not likely that you will benefit with this study directly. But, this scale could assist health professionals in assessing Hindi speaking population worldwide. It could also be used in India, where very few scales are available in Hindi language. As a participant you may feel pride in using your native language to help validate this clinical tool.

Risk: The risk of participation in this study is minimal. As, the assessments are simple and quick to answer and do in the comfort of your home. All the activities involved in this study, are based on your daily activities. So, the physical risk would not be greater than those encountered by you in everyday life.

Voluntary Participation: It will be your decision to participate in this study. If you volunteer to be in this study, you will have the right to withdraw at any time. There would be no consequences of withdrawing from the study. Also, you will be able to refuse to answer any questions you do not want to answer. There will be no penalty if you anytime wish to withdraw from the study.

Confidentiality and Anonymity: Your name, age and gender information will be used identify you. The address and telephone number will be used to locate the home to conduct the interviews. This information will remain confidential. It will be disclosed only with your permission or as required by law. Your confidentiality will be maintained using codes available to only Mr. Pranshu Arora and Dr. Lili Liu. The master list will be kept

separately in a locked cabinet with the signed informed consent forms. We will not use your name in any of the information we get from this study or in any of the research reports. Once the study is finished, the information related to you and coding will be destroyed after the interviews, except the collected data that will be used in the analysis of the study. Any information we use for publication will not identify you individually.

Further Information:

This study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

CONSENT FORM

PART 1
Reliability and validity of the Hindi version of the Falls Efficacy Scale–International (FES-I) for use

in Canada.

Supervisor

Lili Liu, PhD, Professor and Chair, Department of Occupational Therapy, Faculty of Rehabilitation Medicine, University of Alberta, Edmonton, AB. T6G2G4.

Principle Investigator

Pranshu Arora, MSc Student, Department of Rehabilitation Medicine – Occupational Therapy, Corbett Hall, University of Alberta, Edmonton, AB. T6G 2G4 Phone: (780) 807-1490

PART 2	YES	NO
Do you understand that you have been asked to be in a research study?	□	□
Have you read and received a copy of the attached Information Sheet?	□	□
Do you understand the benefits and risks involved in taking part in this research study?	□	□
Do you understand who will have access to the information you provide, including personally identifiable health information?	□	□
Have you had an opportunity to ask questions and discuss this study?	□	□
Do you understand that you are free to withdraw from the study at any time without having to give a reason?	□	□
Has the issues of confidentiality been explained to you?	□	□

Who explained this study to you? _____

I agree to take part in two interviews: YES □ NO □

Signature of research participant: _____

(Printed Name): _____

Date (D/M/Y): _____

Signature of Witness: _____

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

Signature of Investigator _____

Date (D/M/Y): _____

APPENDIX I: Recruitment Poster (Hindi)

UNIVERSITY OF ALBERTA

व्यावसायिक चिकित्सा विभाग में अनुसंधान के लिए स्वयंसेवकों की जरूरत

- क्या आप हिन्दी भाषा जानते हैं?
- क्या आपकी उम्र 60 साल या उसे ज़ादा है?

अगर हां, तो आपकी सहयता से एक मान्य मूल्यांकन हिन्दी में अनुवादित किया जा सकता है ।

- हम ऐसे स्वयंसेवकों को देख रहे हैं जो "फॉल्स एफिकॅसी स्केल - इंटरनॅशनल" की हिन्दी में मान्यता प्राप्त करने के लिए में अपना योगदान दे सकें ।

- इस अध्ययन में आपको एक साधारण 16 आइटम वाली प्रश्नोत्तरी दी जाएगी और उसके अलावा, दो साधारण परीक्षण, बर्ग बॅलेन्स स्केल (बीबीएस) और टाइम्ड-उप-एंड-गो टेस्ट(टग) द्वारा जांच की जाएगी जिनका संबंध आपकी रोजमर्रा की गतिविधियों के आधार पर होगा ।

- इस अध्ययन को दो सत्रों में बाटा जाएगा । पहले सत्र में प्रशनावली और 2 साधारण परीक्षण किए जाएँगे, जिसमे लगभग 55-65 मिनिट लग सकते है । दूसरा सत्र लगभग 10-15 मिनिट का होगा जो की ठीक दो हफ्ते बाद किया जाएगा, और जिसमे केवल प्रशनावली के प्रयोग किया जाएगा ।

अधिक जानकारी के लिए या इस अध्ययन में भाग लेने के लिए, कृपया संपर्क करें:

प्रांशु अरोड़ा

PHONE: (780) 492 - 1728

EMAIL: parora@ualberta.ca

Pranshu Arora (780) 492 - 1728	Pranshu Arora (780) 492 - 1728
Pranshu Arora (780) 492 - 1728	Pranshu Arora (780) 492 - 1728
Pranshu Arora (780) 492 - 1728	Pranshu Arora (780) 492 - 1728
प्रांशु अरोड़ा (780) 492 - 1728	प्रांशु अरोड़ा (780) 492 - 1728
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प्रांशु अरोड़ा (780) 492 - 1728	प्रांशु अरोड़ा (780) 492 - 1728

APPENDIX J: Recruitment Poster (English)

UNIVERSITY OF ALBERTA

VOLUNTEERS NEEDED FOR RESEARCH IN DEPARTMENT OF OCCUPATIONAL THERAPY

- DO YOU KNOW HINDI LANGUAGE?
- ARE YOU 60 YEARS OR OLDER?

If YES, you can help validate an assessment translated into HINDI.

- We are looking for volunteers to participate in the study to validate the "**Falls Efficacy Scale"** in the **HINDI Language**

- You would be asked to fill a 16-item questionnaire in the comfort of your home and participate in two short tests, whose steps resemble your daily living activities like sitting and getting up from a chair.

- Your participation would involve two sessions. The first session will include a questionnaire and two tests, which would take around 55-65 minutes. The second session will include only a questionnaire, and would be administered after two weeks of the first session. It would take around 10 -15 minutes.

For more information, or to volunteer, please contact:

PRANSHU ARORA

PHONE (lab): (780) 492-1728

EMAIL: parora@ualberta.ca

बर्ग बॅलेन्स स्केल

बर्ग बॅलेन्स स्केल (बीबीएस), बुजुर्ग लोगों के बीच संतुलन को मापने के लिए विकसित किया गया था, जिसका आकलन कार्यात्मक गतिविधियों के प्रदर्शन द्वारा किया गया था । यह एक मान्य स्केल है, जिसका इस्तेमाल उपचार के महत्व को जानना, मात्रात्मक विवरणों की परिपाटी और नैदानिक अनुसंधान कार्य के लिए इस्तेमाल किया जाता है । इस स्केल का अनेक अध्ययनों में विश्वसनीयता का मूल्यांकन किया गया है ।

विवरण:

यह एक 14 सवालो की प्रश्नावली है जो बुजुर्ग लोगों के बीच संतुलन को मापता है ।

उपकरण की आवश्यकता:

शासक, दो मानक कुर्सियों (भुजा के साथ और एक भुजा के बिना), चौकी, स्टॉपवॉच या घड़ी, 15 फुट रास्ता ।

समापन:

समय: 15-20 मिनट

स्कोरिंग: एक पांच सूत्री पैमाने, 0-4 के बीच में स्कोरिंग की जाती है । "0" निम्नतम स्तर को इंगित करता है और "4" उच्चतम स्तर को करता है । (कुल स्कोर = 56)

स्कोरिंग की व्याख्या

41-56 = कम गिरने का जोखिम

21-40 = मध्यम गिरने का जोखिम

0 -20 = उच्च गिरने का जोखिम

बर्ग बॅलेन्स स्केल

नाम:_____ तिथि: _____

स्थान: _____ रेटर: _____

आइटम विवरण	स्कोर (0-4)
बॅठकर उठना -	
बिना सहारे के खड़े रहना -	
बिना सहारे के बॅठना, लेकिन पैर फर्श पर या स्टूल पर रहने चाहिए -	
बॅठ के उठना -	
स्थानांतरण -	
आँखें बंद करके बिना सहारे के खड़े रहना -	
पॅरों को बराबर रखकर, बिना सहारे के खड़े रहना -	
खड़े रहकर और अपने हाथों को सामने फेलाकर आगे बढ़ें -	
खड़े होकर फर्श से सामान उठाइए -	
खड़े रहकर बाएँ और दाएँ कंधे के उपर से पीछे देखें -	
360 डिग्री घूमिए -	
बिना सहारे खड़े रहकर, एक पॅर को सामने पडे स्टूल पर रखे -	
बिना सहारे खड़े रहकर, एक पॅर को दूसरे के सामने रखें -	
एक पॅर पर खड़े होइए -	

कुल स्कोर _____

सामान्य निर्देश

प्रत्येक कार्य जैसें लिखे गए है, वैसे ही व्यक्ति को निर्देश दे । स्कोरिंग करते वकत, हर प्रशन में प्रतिक्रिया के सबसे निचले वर्ग को ही रेकॉर्ड करें ।

काई प्रशनों में, व्यक्ति को बताए गयी स्तिथि को बनाए रखने को कहा गया है. कुल स्कोर से अंकों को काटा जाएगा अगर:

- समय और दूरी की आवश् यकताओं की पूर्ति नहीं की जाएगी,
- व्यक्ति को कार्य करते वकत निरीक्षण की ज़रूरत पडे,
- वयक्ति अधिक सहयता लेकर कार्य करे

व्यक्ति को मालूम होना चाईए की कार्य करते वकत उसे संतुलन बनाए रखना होगा । ये पूरी व्यक्ति की पसंद होगी की वो कौनसा पॅर प्रयोग करना चाहेंगे या कितनी दूरी पर रखना चाहेंगे । खराब निर्णय से अवश्य ही कार्य और स्कोरिंग पर प्रभाव पड़ेगा ।

परीक्षण के लिए आवश्यक उपकरणों है स्टॉपवाच या दूसरे हाथ में घड़ी, स्केल या कोई और वास्तु जो 2, 5 और 10 इंच का माप दिखाए । परीक्षण के लिए उचित ऊँचाई की कुर्सियों का प्रयोग किया जाना चाहिए । प्रशन 12 के लिए उचित ऊँचाई की चौंकी या स्टूल का प्रयोग होना चाईए ।

बर्ग बॅलेन्स स्केल

बॅठकर उठना

निर्देश: कृपया बिना सहारा लिए उठे ।

( ) 4 - हाथ का उपयोग किए बिना खड़ा होना और स्वतंत्र रूप से स्थिर करने में सक्षम रहना

( ) 3 - हाथ का उपयोग कर स्वतंत्र रूप से खड़ा होना

( ) 2 - कई कोशिश के बाद हाथ का उपयोग कर खड़ा होना

( ) 1 - खड़े या स्थिर करने के लिए कम से कम सहायता लेना

( ) 0 - खड़े या स्थिर करने के लिए अधिक से अधिक सहायता लेना

बिना सहारे के खड़े रहना

निर्देश: कृपया बिना सहारे के दो मिनट के लिए खड़े रहे ।

( ) 4 - 2 मिनट के लिए सुरक्षित रूप से खड़ा रहना

( ) 3 - पर्यवेक्षण के साथ 2 मिनट खड़ा करने में सक्षम

( ) 2 - 30 सेकंड के लिए सुरक्षित रूप से खड़ा रहना

( ) 1 - असमर्थित 30 सेकंड खड़े रहने के लिए कई कोशिश करना

( ) 0 - 30 सेकंड असमर्थित खड़ा करने में असमर्थ रहना

(अगर कोई 2 मिनट के लिए सुरक्षित रूप से खड़ा रहने में सक्षम है, उनको असमर्थित बॅठने के लिए पूर्ण स्कोर दे और, आइटम # 4 के लिए आगे बढ़ें)

बिना सहारे के बॅठना, लेकिन पैर फर्श पर या स्टूल पर रहने चाहिए

निर्देश: कृपया 2 मिनट के लिए हाथो को बँध करके बॅठे ।

( ) 4 - 2 मिनट के लिए सुरक्षित रूप से बॅठे रहना

( ) 3 - पर्यवेक्षण के अंतर्गत 2 मिनट तक बॅठे रहना

( ) 2 - 30 सेकंड के लिए सुरक्षित रूप से बॅठे रहना

( ) 1 - 10 सेकंड के लिए सुरक्षित रूप से बॅठे रहना

( ) 0 - बिना सहारे 10 सेकंड के लिए बैठने में असमर्थ रहना

बॅठ के उठना

निर्देश: कृपया बैठ जायें ।

( ) 4 - हाथ का न्यूनतम उपयोग के साथ सुरक्षित रूप से बॅठना

( )3-हाथों का उपयोग करके नियंत्रण करना

( ) 2 - पॅरो से कुर्सी का सहारा लेकर अपने आप को नियंत्रण करना

( ) 1 - स्वतंत्र रूप से बॅठना, लेकिन अनियंत्रित वंश में

( ) 0 - बैठने के लिए सहायता लेना

स्थानांतरण

निर्देश: (धुरी हस्तांतरण के लिए कुर्सी (ओं) की व्यवस्था करे), कृपया अपना स्थान बदलिए एक बार बांह वाली कुर्सी पर और दूसरी बार बिना बांह वाली कुर्सी पर । आप दो कुर्सियों या एक बिस्तर और एक कुर्सी का उपयोग कर सकते है ।

( ) 4 - हाथ का उपयोग किए बिना सुरक्षित रूप से स्थानांतरित करना

( ) 3 - हाथ का कम से कम उपयोग करके स्थानांतरण करना

( ) 2 - मौखिक इशारे और / या पर्यवेक्षण के साथ स्थानांतरित करना

( ) 1 - एक व्यक्ति की सहायता के साथ स्थानांतरित करना

( ) 0 - दो व्यक्तियों की सहायता के साथ स्थानांतरित करना

आँखें बंद करके बिना सहारे के खड़े रहना

निर्देश: कृपया अपनी आखें बंद करें और 10 सेकेंड के लिए खड़े रहे ।

( ) 4 - सुरक्षित रूप से 10 सेकेंड तक खड़े रहना

( ) 3 - पर्यवेक्षण के साथ 10 सेकेंड तक खड़े रहना

() 2- सुरक्षित रूप से 3 सेकेंड तक खड़े रहना

( ) 1 - 3 सेकेंड तक आँखें रखने में असमर्थ रहना लेकिन सुरक्षित रूप से खड़े रहना

( ) 0 - गिरने के दर्र से सहयता लेना

पॅरों को बराबर रखकर, बिना सहारे के खड़े रहना

निर्देश: कृपया अपने पॅरों को बराबर लाइए और बिना सहारे के खड़े हो जाइए ।

( ) 4 - स्वतंत्र रूप से एक साथ पॅरों को बराबर लाना और सुरक्षित रूप से 1 मिनट तक खड़े रहना

( ) 3 - स्वतंत्र रूप से एक साथ पॅरों को बराबर लाना और पर्यवेक्षण के साथ 1 मिनट तक खड़े रहना

( ) 2 - स्वतंत्र रूप से एक साथ पॅरों को बराबर लाना और सुरक्षित रूप से 30 सेकेंड तक खड़े ना रहे पाना

( ) 1 - पॅरों को बराबर लाने के लिए सहयता लेना लेकिन 15 सेकंड तक खड़े रहना

( ) 0 - पॅरों को बराबर लाने के लिए सहयता लेना और 15 सेकंड तक खड़े ना रहे पाना

खड़े रहकर और अपनी बाहों को सामने फेलाकर आगे खींचे.

निर्देश: कृपया अपने बाहों को 90 डिग्री तक उठायें, और सामने की ओर फेलाकर आगे खिचने की कोशिश करें ।

(बाहों को सामने 90 डिग्री पे रखकर । परीक्षक उंगलियों के आगे स्केल को स्थापित करेंगे. अपने आप को खिचतें वकत ये एहतियात रखें की हाथ स्केल से दूरी पर रहें । जितना आगे उंगलियाँ जायें उतनी ही दूरी रेकॉर्ड की जाए । कमर को घुमाव से बहचाने के लिए कोशिश करें की व्यक्ति दोनो हाथों को आगे खींचे ।)

( ) 4 - आत्मविश्वास के साथ 25 सेमी (10 इंच) तक आगे खींचना

( ) 3 - आत्मविश्वास के साथ 12 सेमी (5 इंच) तक आगे खींचना

( ) 2 - आत्मविश्वास के साथ 5 सेमी (2 इंच) तक आगे खींचना

( ) 1 - आगे खींचना लेकिन देख रेख के साथ

( ) 0 - सहारा लेते वक्त संतुलन खो बॅठना

खड़े होकर फर्श से सामान उठाइए

निर्देश: कृपया अपने पॅरों के सामने पड़े जुते / चप्पल को उठिए ।

()4 - सुरक्षित रूप से और आसानी से जूता / चप्पल उठा लेना

( ) 3 - सुरक्षित रूप से जूता / चप्पल उठाना लेकिन पर्यवेक्षण की जरूरत पढ़ना

( ) 2 - उठा ना पाना लेकिन जुतो के 2-5 सेमी (1-2 इंचस) करीब तक पहुचना, और अपना संतुलन बनाए रखना

( ) 1 - उठा ना पाना और कोशिश करते वक्त पर्यवेक्षण की जरूरत पढ़ना

()0 - कोशिश करने में असमर्थ रहना / और गिरने के दर्र से सहयता लेना

खड़े रहकर बाएँ और दाएँ कंधे के उपर से पीछे देखें

निर्देश: कृपया बायें कंधे के उपर से सीधा पीछे देखें और फिर उसी प्रकार दायें कंधे के उपर से सीधा पीछे देखें (बेहतर मोड़ के लिए परीक्षक रोगी के पीछे किसी वास्तु का प्रयोग कर सकते है)

( ) 4 - दोनो तरफ बेहतर तरीके से मुड़ना और वजन का अछी तरह से बदलाव करना

( ) 3 - एक तरफ से पीछे देख पाना, दूसरी ओर वजन में कम बदलाव लाना

( ) 2 - दोनो तरफ हल्का सा मूड पाना, लेकिन संतुलन बनाया रखना

( ) 1 - मुड़ते वकत पर्यवेक्षण की ज़रूरत पढ़ना

( ) 0 - गिरने के दर्र से सहयता लेना

360 डिग्री घूमिए

निर्देश: कृपया एक दिशा में पूरा चक्र घूमिए और फिर रुक कर दूसरी दिशा में पूरा चक्र घूमिए ।

()4 - 4 सेकंड या उससे कम में सुरक्षित रूप से 360 डिग्री घूमना

()3 - 4 सेकंड या उससे कम में सुरक्षित रूप से केवल एक तरफ 360 डिग्री घूमना

()2 - सुरक्षित रूप से, लेकिन धीरे - धीरे 360 डिग्री घूमना

()1 - पर्यवेक्षण या मौखिक इशारो की ज़रूरत पढ़ना

()0 - घूमते वकत सहयता की ज़रूरत पढ़ना

बिना सहारे खड़े रहकर, एक पॅर को सामने पड़े स्टूल पर रखे

निर्देश: कृपया दोनो पॅरों को बारी बारी स्टूल पर रखें और ये प्रक्रिया तब तक दोहरायें जब तक दोनो पॅर स्टूल पर 4 - 4 बारी ना आजयें ।

( ) 4 - स्वतंत्र रूप से और सुरक्षित रूप से खड़ा रहना और 20 सेकंड में 8 चरणों को पूरा करना

( ) 3 - स्वतंत्र रूप से खड़े रहना और 20 सेकंड से ज़्यादा में 8 चरणों को पूरा करना

( ) 2 - पर्यवेक्षण के साथ और सहायता के बिना 4 चरणों को पूरा करना

( )1 -न्यूनतम सहायता के साथ 2 चरणों से ज़्यादा को पूरा करना

( ) 0 - गिरने के दर्र से सहयता लेना या कोशिश ही न्ही करना

बिना सहारे के खड़े रहकर, एक पॅर को दूसरे के सामने रखें

निर्देश: (इस विषय को प्रदर्शित) कृपया एक पॅर को दूसरे के पॅर के एकदम सामने रखें, अगर आपको मुश्किल महसूस हो तो थोड़ा दूर करके रखें । (3 अंक हासिल करने के लिए, पॅरों के बीच की दूरी एक पॅर की लंबाई से बड़ी होनी चाईए और रुख की चौड़ाई ल्गभग कदमो की चौड़ाई के बराबर होनी छाईए ।

( ) 4 - स्वतंत्र रूप से पॅर को मिलकार रखना और उससे 30 सेकेंड्स के लिए रोके रखना

( ) 3 - स्वतंत्र रूप से पॅर को थोड़ा दूर रखना और उससे 30 सेकेंड्स के लिए रोके रखना

( ) 2 - स्वतंत्र रूप से छोटे कदम उठना और उससे 30 सेकेंड्स के लिए रोके रखना

( ) 1 - कदम बढ़ाना के लिए सहायता लेना, लेकिन उससे 15 सेकेंड्स के लिए रोके रखना और पॅर उठाते वकत या खड़े हुए संतुलन खोना

एक पॅर पर खड़े होइए

निर्देश: कृपया बिना सहारे के एक पॅर पर खड़े होने की कोशिश करें ।

()4 - स्वतंत्र रूप से पैर उठाना और उससे 10 सेकंड से ज़्यादा के लिए रोके रखना

()3 - स्वतंत्र रूप से पैर उठाना और उससे 5-10 सेकंड के लिए रोके रखना

()2 - स्वतंत्र रूप से पैर उठाना और उससे 3 सेकंड से ज़्यादा के लिए रोके रखना

()1 - स्वतंत्र रूप से पैर उठाने की कोशिश करना लेकिन उससे 3 सेकेंड्स तक न्ही रोक पाना और बिना सहयता के खड़े रहना

()0 - गिरने के दर्र से सहयता लेना या कोशिश ही न्ही करना

( ) कुल स्कोर (अधिकतम = 56)

(टाइम्ड अप एंड गो) समय शुरू और पूरा होने के निर्देश

सामान्य जानकारी (पोड्सियडलो और रिचर्डसन, 1991 सेप्राप्त)

- रोगी को एक आरामकुर्सी पर बैठना चाहिए, उसका / उसकी पीठ कुर्सी की तरफ और उसका / उसकी बांह कुर्सी की बाहों पर आराम से रखे । ऐसा कोई भी उपकरण, जो चलने के लिए सहायक हो रोगी के पास होना चाहिए ।
- नियमित जूतो और प्रथागत चलने वाले साधनो का इस्तेमाल किया जाना चाहिए ।
- रोगी को एक पंक्ति में चलना चाहिए जो कि उससे 3 मीटर (9.8 फुट) दूर है, पंक्ति पर घूमे, वापिस कुर्सी की तरफ जाए और बैठ जाए ।
- जब रोगी कुर्सी पर बैठ जाए तब यह परीक्षा समाप्त हो जाती है ।
- मरीजों को एक आरामदायक और सुरक्षित चलने की गति का उपयोग करने के निर्देश दिया जाना चाहिए ।
- परीक्षण समय के लिए एक स्टॉप वॉच का इस्तेमाल किया जाना चाहिए ।

सेट अप

- 3 मीटर (9.8 फुट) रास्ता नापे और चिन्हित करे ।
- चलने की शुरुआत में एक मानक ऊंचाई (सीट ऊंचाई 46cm, कुर्सी की बाजु की ऊंचाई 67cm) वाली कुर्सी रखे ।

रोगी निर्देश

(पोड्सियडलो औररिचर्डसन, 1991 से व्युत्पन्न):

- रोगी को कुर्सी पर बैठने की आज्ञा दे और उसका / उसकी पीठ कुर्सी की तरफ और उसका / उसकी बाहों को कुर्सी की बाहों पर आराम से रखे ।
- रोगी की बांह किसी सहायक उपकरण (यदि चलने के लिए इस्तेमाल किये गये हो) पर नहीं होने चाहिए, लेकिन यह पास होने चाहिए ।

- इस परीक्षण का प्रदर्शन मरीज को दे।
- जब रोगी तैयार हो जाए , तो चलने के लिए कहें ।
- जब आप कहें "जाओ", तो स्टॉप वॉच शुरू कर देना चाहिए और जब रोगी कुर्सी पर बैठ जाए तब ही स्टॉप वॉच बंद कर देना जाना चाहिए ।

(टाइम्ड अप एंड गो) परीक्षण पर्चा (फार्म)

नाम: _____

सहायक उपकरण का इस्तेमाल : _____

तिथि : _____

परीक्षण समय : _____

तिथि : _____

परीक्षण समय : _____

तिथि : _____

परीक्षण समय : _____

तिथि : _____

परीक्षण समय : _____

तिथि : _____

परीक्षण समय : _____

संदर्भ:

Podsiadlo, डी. और रिचर्डसन, एस (1991). "समय समाप्त हो गया" ऊपर और जाओ ": कमजोर बुजुर्ग व्यक्तियों के लिए बुनियादी कार्यात्मक गतिशीलता का एक परीक्षण." जेएम Geriatr समाज 39 (2): 142-148.

APPENDIX M: University of Alberta Health Research Ethics Board approval.

Approval Form

Date:	March 20, 2014
Study ID:	Pro00044536
Principal Investigator:	Lili Liu
Study Title:	Reliability and validity of the Hindi version of the Falls Efficacy Scale-International (FES-I) for use in Canada
Approval Expiry Date:	March 19, 2015
Sponsor/Funding Agency:	University of Alberta, Faculty of Rehabilitation Medicine

Thank you for submitting the above study to the Health Research Ethics Board - Health Panel. Your application has been reviewed and approved on behalf of the committee.

A renewal report must be submitted next year prior to the expiry of this approval if your study still requires ethics approval. If you do not renew on or before the renewal expiry date, you will have to re-submit an ethics application.

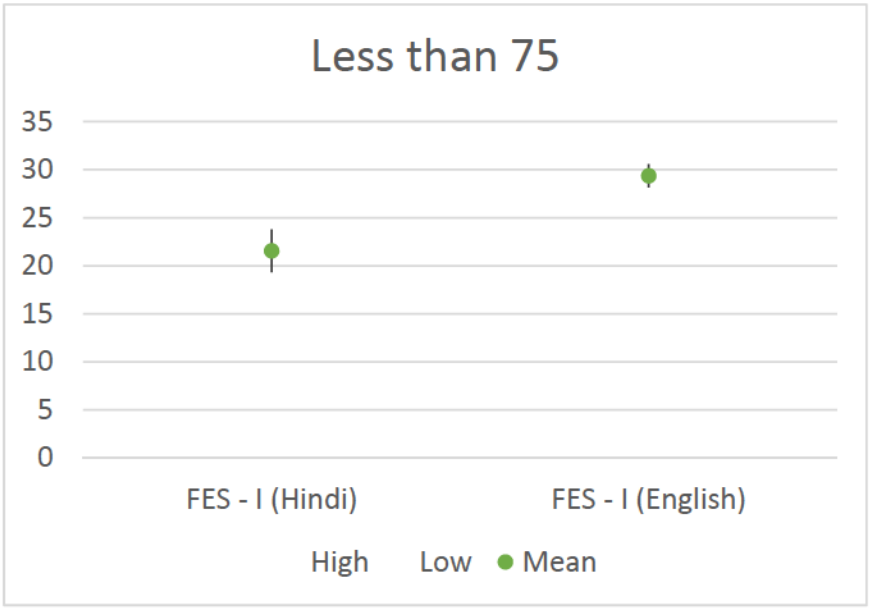
Approval by the Health Research Ethics Board does not encompass authorization to access the patients, staff or resources of Alberta Health Services or other local health care institutions for the purposes of the research. Enquiries regarding Alberta Health Services approvals should be directed to (780) 407-6041. Enquiries regarding Covenant Health should be directed to (780) 735-2274.

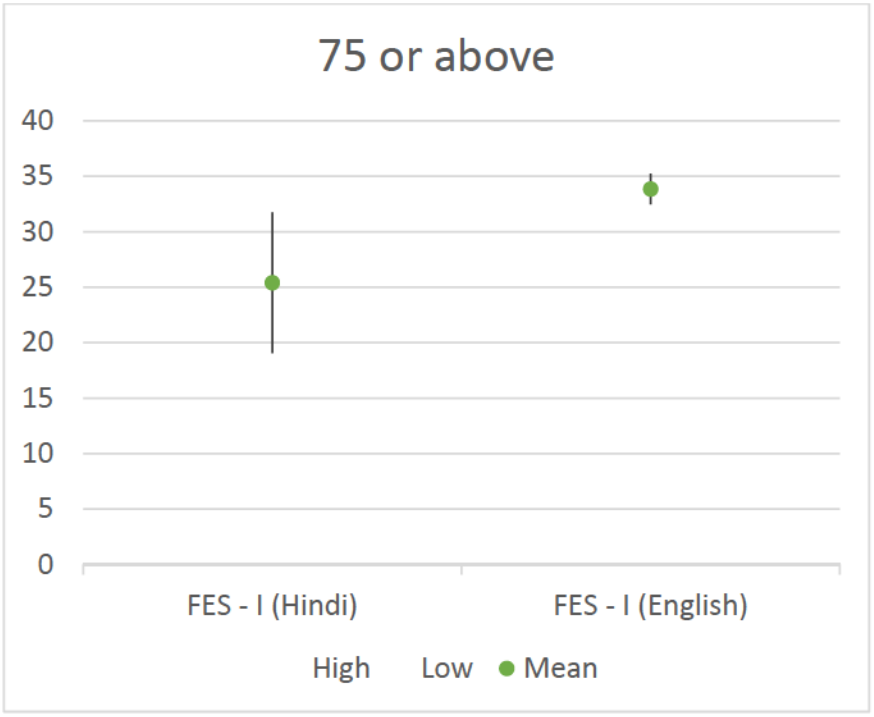
Sincerely,

Anthony S. Joyce, Ph.D.
Chair, Health Research Ethics Board - Health Panel

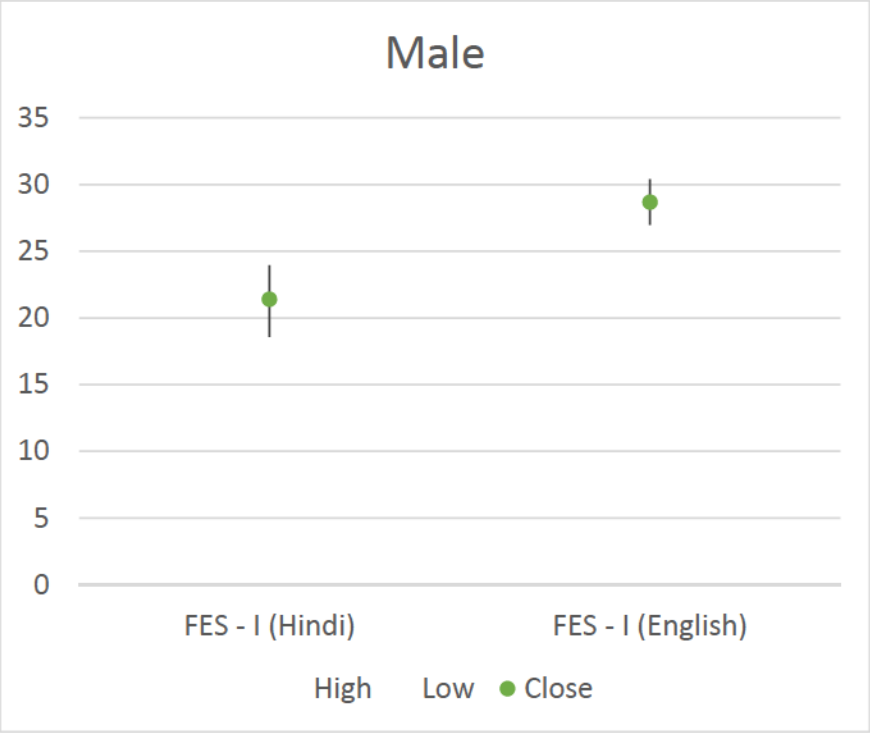
Appendix N: Comparison of mean scores of FES-I (Hindi) and FES-I (English) by age, gender, history of falls and occupational status.

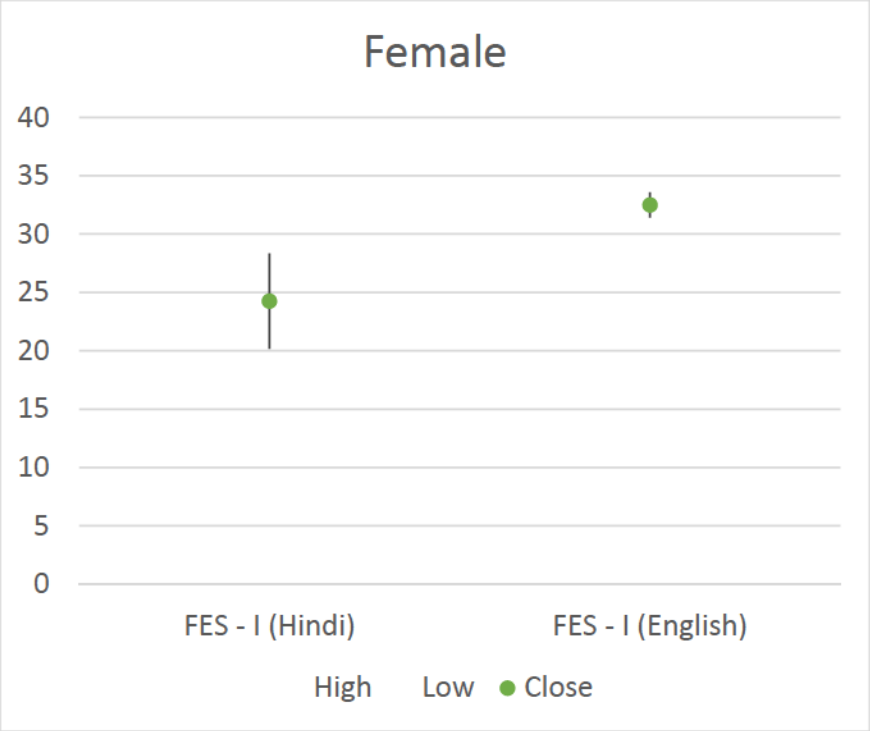
AGE



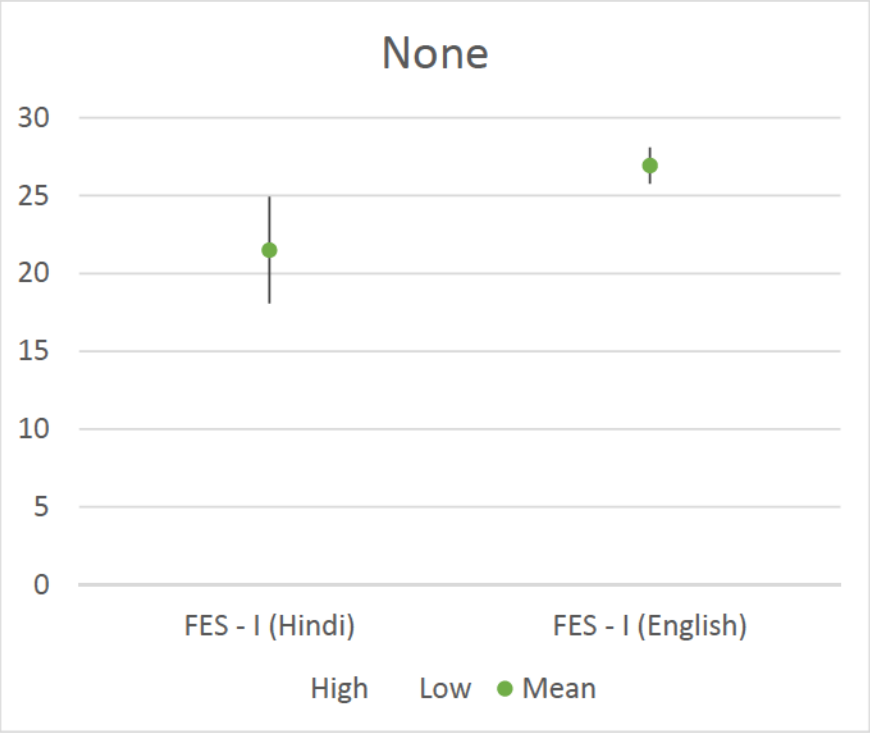


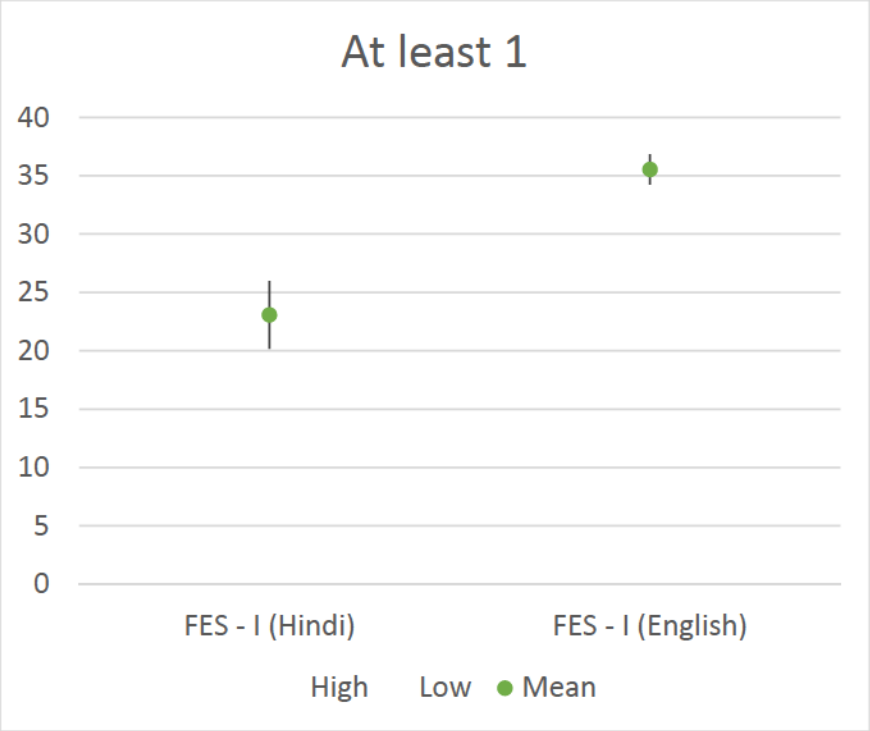
GENDER


Male
35
30
25
20
15
10
5
0
FES - I (Hindi)
FES - I (English)
High
Low
Close


Female
40
35
30
25
20
15
10
5
0
FES - I (Hindi)
FES - I (English)
High
Low
Close

HISTORY OF FALLS





OCCUPATIONAL STATUS