## Research Article

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# Prognosis of treatment outcomes by cognitive and physical scales

**Abstract**: The aim of this study was to assess the possibility of using scales for measuring cognitive and physical functions for a prognosis of care outcomes in elderly patients. Methodology. The survey was carried out in one of the Vilnius City Hospitals for Nursing and Support Treatment. A total number of 177 respondents were involved in the study. The Mini–Mental State Examination (MMSE), The Barthel Index (BI) and The Morse Fall Scale were used. Results. A statistically significant correlation was revealed between the scores of MMSE and BI (Pearson R = 0.41, p < 0.01); those with severe cognitive impairment were more dependent. A statistically significant correlation (Pearson R = -0.181, p < 0.01) was reported between the scores of MMSE and the Morse Fall Scale – the risk of falling was higher in patients with severe cognitive impairment. Conclusions. The Morse Fall Scale was not suitable for the prognosis of outcomes. The MMSE was suitable for the prognosis of a patient's discharge. The Barthel Index should be considered as the most suitable tool for the prognosis of care outcomes: the sum-score of the Barthel Index above 25 may suggest that the patient would be discharged home; the sum-score below this level was associated with a higher likelihood of patient death.

**Keywords:** Nursing home; Functional capacity; Cognitive impairment; Outcome; Mortality; Elderly patients.

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## 1 Introduction

The proportion of elderly people has been constantly increasing worldwide, including in Lithuania. The quality of life of elderly people could be predefined by physical independence and intact cognitive functions.

Cognitive dysfunction can develop as a result of different pathological conditions, such as volume reduction of grey and white matter in the brain, and vision and hearing disorders [1]. The presence of cognitive dysfunction may predispose delirium [2], depression [3], and dementia [1, 4]. Dementia has been associated with many difficulties for both patients and their families. Patients suffering from dementia become increasingly dependent upon other people [5, 6].

There are many tools for the assessment of cognitive dysfunction; however, the best tool for this purpose has not been established to date. The abundance of available instruments raises concerns whether medical professionals and investigators can assess the severity of disorders properly and in a timely manner, as each tool is associated with certain limitations. The following are the most commonly used tools for the assessment of cognitive functions: the Mini-Mental State Examination (MMSE) [7], the Six-item Cognitive Impairment Test [8] and the Abbreviated Mental Test [9]. The Mini-Mental State Examination (MMSE) is considered as the gold standard for the assessment of cognitive dysfunction and is most frequently used for a diagnosis of cognitive impairment. Moreover, this questionnaire is used widely for the diagnostics of cognitive impairment in elderly patients [10] allowing the disclosure of cognitive dysfunction in less than 10 minutes. It can also be carried out by physicians and nurses.

The studies demonstrated that patients treated in nursing homes suffer both from cognitive impairment (cognitive disorders were diagnosed in 67% of patients) and an inability to perform activities of daily living (ADL) (reported in 56% of patients) [11]. The Barthel Index (BI) has been used to assess the level of patient independence in daily living [12-14]. BI was developed as an instrument to assess the disability of patients suffering from nervous and musculoskeletal diseases receiving in-hospital reha-

bilitation treatment [15]. A high sum-score indicating a better status on the BI and MMSE has been associated with a higher likelihood of returning home after treatment in a nursing home [13].

Falls are associated with severe social and psychological (e.g. depression) consequences [16], and they are one of the major causes of hospitalisation, morbidity and mortality among elderly people [17]. In 2010, Spirgienė reported an assessment of falls for individuals living in LTCF in Lithuania. She established that a number of falls during 30-day period among female patients was four times higher than among males, and almost one third of all patients (28.2%) experienced falls. Analysis of the frequency of falls among different age groups revealed that most falls were reported in people aged 85 and over (36.1%) [18]. In addition, a risk of falls and their frequency in nursing hospitals were analyzed by Spirgienė and Kisielienė (2013). They found that almost half of patients (49.6%) had fallen at least once in 4 months. Falls associated with older age require a longer treatment period [14]. Risk of falls can be assessed by applying different scales, e.g. the Berg Balance Scale for the assessment of functional tasks, the Timed Up and Go scale, designed to examine movements, and the Morse Fall Scale to assess a risk of falls [19].

The following scales are used for prognosing outcomes of treatment, although usually single instruments are applied for specific population. Yu-Ping Su and colleagues (2014) discovered the correlation between impairment of cognitive functions and increased mortality among elderly persons using mental health care services [20]. There are more findings showing that a lower cognitive function in dementia can predict mortality [21]. Few studies reported survival using the MMSE and BI together. The persons with high BI scores and low MMSE scores had the highest probability to be unable to live at home after discharge [22].

In Lithuania, there haven't been any studies that have researched the prognosis of outcomes of a treatment in nursing and supportive treatment hospitals to date. However, there have been several trials relating to the results of patient care and their interfaces with the work of nurses in the nursing and supportive treatment hospitals [23]. Riklikienė (2010) analyzed a support treatment and nursing hospitals for patient satisfaction with the services provided [24]. Another study was conducted by Prokurotas, Šilys, Čepulis and Gurevičius (2010). The authors found that EQ-5D-SL model provides an opportunity to analyze the indicators of the functional state of the patient to monitor their changes, and to determine the health status index. The results of the entire nursing process can be measured and analyzed showing the changes in quality of life dependent on nursing or determine the results of the organizations [25].

The scientific problem. This study was initiated considering the fact that there are insufficient data available on the use of scales measuring cognitive and physical functions for prognosis purposes and prognostic values of such scales for patients treated in a nursing home. The above-mentioned scales are important as they were used for study purposes to assess the cognitive and physical functions of patients treated in nursing homes and to predict outcomes.

The aim of this study was to assess a possibility of using the scores of the scales measuring cognitive and physical functions of patients treated in a nursing home for a prognosis of treatment outcomes of elderly patients.

The main study objectives were: a) to evaluate the level of loss of cognitive and physical functions of elderly patients; b) to assess the prognostic value of the Mini-Mental State Examination, the Morse Fall Scale, and the Barthel Index for prediction of treatment outcomes; c) to establish the prognostic value of the Mini-Mental State Examination, the Morse Fall Scale, and Barthel index questionnaires for predicting death cases in a nursing home.

The hypothesis: The scales measuring cognitive and physical functions in nursing home predict treatment outcomes of elderly patients.

The study was conducted over a period of four months during hospitalisation. Only part of the study covering the first month during hospitalisation is discussed in this article. The objective of this stage of the study was to assess remote results of the one-month treatment in the nursing hospital.

# 2 Materials and methods

## 2.1 Participants

Vilnius is one of the largest counties in Lithuania which has a higher than average elderly population. For this reason, Vilnius County was selected for our research. The survey was carried out in one of the Vilnius City Hospital for Nursing and Support Treatment. The calculation of an adequate sample size was 177, thus in total, 177 respondents were enrolled in the study. They represented almost one third (28.8%) of all the patients treated in the hospital during this period of time. The study was conducted over two time periods: the first period was from 13th January

2015 to 1st April 2015. The second period was from 1st June 2015 to 21st December 2015. We used a targeted study population. The study inclusion criteria were: 1) patients treated in the hospital for nursing care during the period of research; 2) patients aged 60 and over; 3) patients who understood and spoke Lithuanian; 4) patients, who understood and personally provided their permission. Patients who were unable to give their permission, consent was provided by their relatives.

All participants were informed of voluntary nature of participating in the study. Respondents were informed that all of the reported results would be aggregated to protect the identity of individual participants. Participants were given the right to withdraw from the research project. The research was conducted according to the principles of the Declaration of Helsinki.

The Approval No. 158200-13-607-185 to conduct this clinical study was obtained from the Regional Biomedical Research Ethics Committee of the Faculty of Medicine of Vilnius University on 9th April 2013. Permission to conduct the study also was obtained from the State Data Protection Agency (decision dated 22nd July 2014, regarding the issue of permission No. 2R-3740(2.6-1) to the Lithuanian University of Health Sciences to carry out data processing activities).

## 2.2 Instruments

The Mini–Mental State Examination (MMSE), The Barthel Index and The Morse Fall Scale were used for measuring cognitive and physical functions. The scales were in Lithuanian and no validation was needed. The Mini–Mental State Examination (MMSE) was used to assess disorders of cognitive functions and the level of their severity [7]. The MMSE covers 11 questions grouped in 7 areas: orientation in time, orientation in place, memorisation of three subjects, concentration and calculation, repeating three words, speech, and visual assessment. The examination can be completed in approximately 10 minutes. The degrees of cognitive impairment in Lithuania have been distributed along the MMSE scale (not taking into account age and education) as follows: 21–24 points – mild cognitive dysfunction; 11–20 points – moderate cognitive dysfunction; 0–10 points – severe cognitive dysfunction [26]. The Barthel Index (BI) was also amended during the study (developed by Mahoney, F. I., Barthel, D. [1965]) and modified by Granger *et al*. [1979]) [15]. The BI indicates the ability of an individual to carry out basic care activities: eating, moving from a wheelchair to a bed and from a bed to a wheelchair, maintaining personal hygiene, using the toilet, taking a shower, walking on a flat surface, climbing up and down stairs, getting dressed, controlling gut function, bowel movements and urination. Each of the above-mentioned activities was assessed with points. The assessment of the total score is as follows: 0–20 completely dependent; 21–61 almost completely dependent; 62–90 moderately dependent; 91–99 – slightly dependent; 100 – independent. Five minutes is enough to complete the questionnaire.

The Morse Fall Scale allows the assessment of a risk of falling [27]. This scale has six sections: history of falls, concomitant diseases, assistance while walking, intravenous therapy, gait and movement, and assessment of mental status. The assessment of the total score is as follows: 0 points – fall risk is absent; < 25 – low risk of falls; 25–45 points – moderate risk of falls; > 45 points – high risk of falls [27, 28].

## 2.3 Statistical analysis

Statistical data analysis was carried out via applying a package of statistical data analysis, SPSS Statistics® (version 21.00). Data were processed via calculating absolute values and percentage values of the indicators. Multinomial logistic regression applying the Forward Stepwise (Likelihood Ratio) and Forward Stepwise (Wald) approaches was used to assess the value of analysed scales and for prediction of patient outcomes after the treatment period. Descriptive statistical analysis was used to calculate frequencies, mean values, range, Pearson's chi-squared test, and degrees of freedom (df). The results of the questionnaire are presented in the tables. The level of statistical significance α = 0.05, when p ≤ 0.05 – the difference was considered as statistically significant.

## 3 Results

In total, 177 respondents were enrolled in the study, 40.1% (n = 71) of study subjects were male and 59.9% (n = 106) were female. The mean age of the respondents enrolled in the study was 78.93 ± 8.95 years. The youngest study subject was 61 years old, and the oldest was 97. The study subjects were distributed into 4 groups according to their age: 7.3% of individuals (n = 13) were 60-64 years old, 26.0% of study subjects (n = 46) were 65-74 years old, 37.9% of participants (n = 67) were 75-84 years old, and 28.8% (n = 51) were aged 85 and above. Almost half of the participants (46.0%) were widowed, one quarter (25.6%)

had never been married, or were divorced. Almost one fifth (18.7%) of the study subjects were discharged home or transferred to another healthcare institution after the first month of hospitalisation (Table 1).

More than half (58.8%) of the survey participants were treated in other healthcare institutions prior hospitalisation. The majority of respondents (39.0%) lived alone before hospitalisation. More than half of the survey participants (58.0%) indicated that their condition worsened more than 30 days before hospitalisation. Slightly more than half of the patients (51.9%) taking part in the survey had significant or moderate cognitive impairment (Table 2).

The majority (85.3%) of the study subjects were completely or almost completely dependent upon other persons. In addition, a high fall risk was established for almost three quarters (68.4%) of the survey participants. Also, more than half of the patients participating in the survey had a severe or moderate cognitive impairment and were completely or almost completely dependent on other persons and with a high risk of fall.

Differences in the Mini-Mental State Examination, Barthel Index, and Morse Fall Scale mean sum-scores among the age groups were evaluated during the study and are reported in Table 3.

Data presented in Table 3 demonstrate that the mean score of the Mini-Mental State Examination is lower in older age groups with the oldest group of patients having moderate cognitive impairment based on the MMSE mean score. In addition, a statistically significant difference was revealed between the age groups and the MMSE mean scores (p = 0.000). The mean scores of the Barthel Index were also lower in older age groups; however, a statistically significant difference between the mean scores of the BI and the age groups was not reported (p = 0.086). Analysis of the mean scores of the Morse Fall Scale revealed an increasing score values among 65-74 years-old respondents. This finding indicates that a high fall risk was on average more frequently reported in all age groups. Moreover, a statistically significant difference (p = 0.036) was established between the age groups of the study subjects and the mean scores of the Morse Fall Scale.

**Table 1:** Sociodemographic data of the study subjects (n = 177)

| Characteristics | Classification | n | % |
|---|---|---|---|
| Gender | Male | 71 | 40.1 |
| | Female | 106 | 59.9 |
| Age group | 60-64 | 13 | 7.3 |
| | 65-74 | 46 | 26.0 |
| | 75-84 | 67 | 37.9 |
| | 85+ | 51 | 28.8 |
| Arrived from | Private house or apartment | 73 | 41.2 |
| | Hospital, psychiatric hospital, or sanatorium | 104 | 58.8 |
| Marital status | Single | 23 | 13.1 |
| | Married | 51 | 29.0 |
| | Widowed | 81 | 46.0 |
| | Divorced | 22 | 12.5 |
| Living arrangement before hospitalisation | Alone | 69 | 39.0 |
| | With a spouse or partner | 50 | 28.2 |
| | With children | 40 | 22.6 |
| | With other people | 18 | 10.2 |
| Condition worsening prior hospitalisation | Within the last 7 days | 19 | 10.8 |
| | 8-14 days before | 24 | 13.6 |
| | 15-30 days before | 31 | 17.6 |
| | 31-60 days before | 43 | 24.5 |
| | More than 60 days before | 59 | 33.5 |
| Change in patient number after one month | Remained hospitalised | 129 | 72.9 |
| | Discharged home | 18 | 10.2 |
| | Died | 15 | 8.5 |
| | Other | 15 | 8.5 |

**Table 2:** Distribution of the respondents according to the results of the Mini-Mental State Examination, *Barthel Index and Morse Fall Scale* (n = 177)

| Test | Characteristic | n | % |
|---|---|---|---|
| Mini-Mental State Examination | Severe cognitive impairment | 19 | 10.7 |
| | Moderate cognitive impairment | 73 | 41.2 |
| | Mild cognitive impairment | 35 | 19.8 |
| | Normal cognitive function | 50 | 28.3 |
| Barthel Index | Completely dependent | 73 | 41.2 |
| | Almost completely dependent | 78 | 44.1 |
| | Moderately dependent | 24 | 13.6 |
| | Independent | 2 | 1.1 |
| Morse Fall Scale | Low fall risk | 9 | 5.1 |
| | Moderate fall risk | 47 | 26.6 |
| | High fall risk | 121 | 68.4 |

**Table 3:** Differences in the *Mini-Mental State Examination*, *Barthel Index* and *Morse Fall Scale* mean scores among the age groups

| Age, Years | Mini-Mental State Examination | | Barthel Index | | Morse Fall Scale | |
|---|---|---|---|---|---|---|
| | Mean | Std. Dev | Mean | Std. Dev | Mean | Std. Dev |
| 60-64 | 24.00 | 4.78 | 39.62 | 29.12 | 65.77 | 19.67 |
| 65-74 | 22.09 | 5.62 | 35.65 | 25.51 | 51.41 | 21.70 |
| 75-84 | 19.48 | 6.54 | 35.07 | 25.92 | 60.07 | 24.18 |
| 85+ | 16.45 | 6.62 | 25.69 | 18.55 | 62.25 | 15.37 |
| F test | 8.967 | | 2.230 | | 2.919 | |
| p | 0.000 | | 0.086 | | 0.036 | |

A statistically significant correlation was established between the scores of the MMSE and the BI (Pearson R = 0.41, p < 0.01); the patients with severe cognitive impairment were more dependent upon other people (Table 4).

The data in Table 4 demonstrate also that a statistically significant correlation (Pearson R = -0.181, p < 0.01) was reported between the scores of the MMSE and the Morse Fall Scale values – a risk of falling was higher in patients with severe cognitive impairement.

The mean score of the MMSE for the patients who died during hospitalisation was 14.47 ± 6.50 (SD). In addition, the mean scores of the MMSE were statistically significantly different by outcome during the treatment period (Table 5).

The patients who died were usually completely dependent on admission, as their mean BI score was almost two-fold lower (16.0 ± 13.52) compared with those further cared in a hospital (32.71 ± 23.32). Also, the mean score of the Morse Fall Scale on admission was highest among the patients who died during the study (63.33 ±

19.06 on average). However, a statistically significant difference between the mean values of this scale by patient outcomes during the one-month hospitalisation period was not established.

Multinomial logistic regression applying the Forward Stepwise (Likelihood Ratio) and Forward Stepwise (Wald) approaches was used to assess the value of the MMSE, BI, and Morse Fall Scale, and for the prediction of patient outcomes after the hospitalisation of one-month period. It was established that only the BI was suitable to predict patient outcomes after the treatment period (Table 6).

The analogous results were obtained after a single-variable (BI) logistic regression. Thus, the equation Z = -1.596+0065* BI allows determination when Z values are greater than 0, i.e., when BI > 25. The obtained regression equation in both cases indicates, that the Z value of the logistic regression becomes positive when the BI score is higher than 25. This means, that the BI value above 25 might suggest that the patient would be discharged home.

**Table 4:** Correlation between the scores of the Mini–Mental State Examination and the Barthel Index, as well as the Morse Fall Scale values (n = 177)

|  |  | Barthel index | Morse Fall Scale |
|---|---|---|---|
| Mini-Mental State Examination | Pearson Correlation | 0.410 | -0.181 |
|  | Sig. (1-tailed) | 0.000 | 0.008 |

**Table 5:** Differences in the *Mini-Mental State Examination*, *Barthel Index,* and *Morse Fall Scale* mean scores by patient outcomes during the first month in a nursing hospital

|  | Mini-Mental State Examination | | Barthel Index | | Morse Fall Scale | |
|---|---|---|---|---|---|---|
|  | Mean | Std. Dev | Mean | Std. Dev | Mean | Std. Dev |
| Remained hospitalised | 19.98 | 6.34 | 32.71 | 23.32 | 59.88 | 20.78 |
| Discharged home | 20.61 | 7.85 | 43.89 | 27.31 | 54.44 | 27.54 |
| Died | 14.47 | 6.50 | 16.00 | 13.52 | 63.33 | 19.06 |
| F test | 5.058 |  | 6.019 |  | 0.757 |  |
| p | 0.007 |  | 0.003 |  | 0.471 |  |

**Table 6:** Logistic regression by Barthel Index

|  | B | Standard Error | Wald (df = 1) | Sig. | Exp (B) |
|---|---|---|---|---|---|
| Barthel Index scores | 0.065 | 0.025 | 6.995 | 0.008 | 1.067 |
| Constant | -1.596 | 0.723 | 4.871 | 0.027 | 0.203 |

$R^2 = 0.302$ (Cox & Snell R Square). Model $X^2$ (1) = 11.888, p < 0.01. Hosmer and Lemeshow $X^2$ = 8.890, p = 0.352. Overall percentage correct = 81.8% .

|  | Score (df = 1) | Sig. |
|---|---|---|
| Mini-Mental State Examination | 0.577 | 0.448 |
| Morse Fall Scale | 0.528 | 0.468 |

However, values below this level were associated with a higher likelihood of patient death.

ROC curve analysis was applied to assess a prognostic value of the MMSE for patients discharged home. The area under the ROC curve was 0.726 (p = 0.027), indicating that the MMSE scale is suitable to predict patient discharge to home. It is very difficult to establish a MMSE score which could predict a clear result of patient discharge. In case of MMSE value of 13.5, we would have a 77.8% likelihood of a properly predicted discharge event of the study subjects. Nevertheless, this value is associated with a very high (46.7%) error probability (Figure 1).

Meanwhile, a value equal to 18.5 significantly reduces the chance of a correct decision regarding patient dis-charge (up to 61.1%) and at the same time minimises (up to 20%) a likelihood of an error.

The BI is suitable to predict the event of patient dis-charge, as the area under the ROC curve was 0.802, p = 0.00. A score of 22.5 on the Barthel Index allows correct classification of 83.3% of positive outcomes (patient dis-charge home) and leads to 20% of incorrect decisions when dead persons are mistakenly attributed to those dis-charged home (Figure 2).

The Morse Scale was not suitable to predict the event of patient discharge, as the area under the ROC curve was 0.609, p = 0.286. The lower limit was found to be below 0.5 as the result of low number of events. Therefore, looking for a significant point of value was not considerd any further.
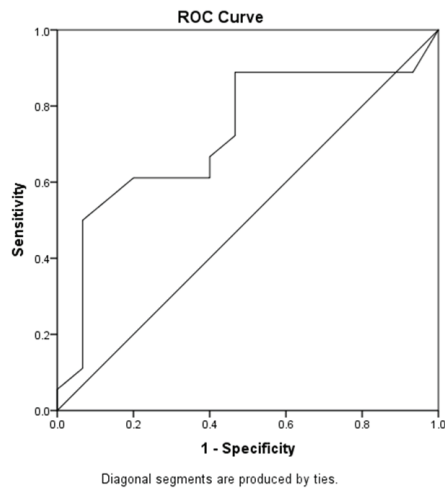
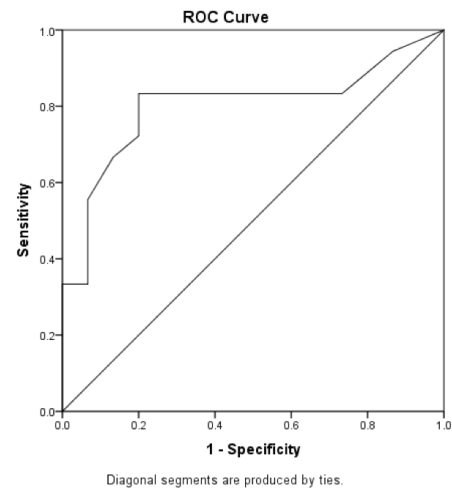**Figure 1:** The prognostic value of the Mini-Mental State Examination for discharge event



**Figure 2:** The prognostic value of the Barthel Index for a discharge event

## 4 Discussion

In our study, statistically significant differences were established between the age groups of the study subjects and the mean values of the MMSE, as well as the Morse Fall Scale. The mean values of the MMSE for patients aged 85 and over in our study were two points higher – 16.45 (SD 6.62) – than in studies conducted by Erdal, Flo, Selbaek *et al.* (2017) [3]. In addition, a statistically significant difference was established between the MMSE and the BI, as well as the Morse Fall Scale. Fiorini, Pandini, De Matthaeis *et al.* (2013) described a study in which the total MMSE score correlated with the total score of the BI, and the results of the Morse Fall Scale [29]. Besides, Su *et al.* (2014) demonstrated that a total MMSE below 25 was associated with statistically significantly lower survival rates of these patients, regardless of the presence or absence of dementia [20]. Morever, Lindquist and colleagues (2011) described a study in which the mean values of the MMSE for patients were the same as in our study [30]. Patients might not comprehend discharge instructions, so this adversely influences outcomes, for example rehospitalisation.

Analysis of scientific publications revealed many studies disclosing prognostic indicators of mortality in elderly people. Some authors monitored patients for one year [31], others for a period from 6 months [32, 33] to 5 years [32], or for 10–12 years [34]. There were studies in which patients were followed for 30 days [35], or studies assessing risk of death by the time of day, day of the week, and at weekends [36]. The investigators [31] have assigned one or two risk points for critical age intervals, assigning one point for patients aged 70–74 and two points for those

aged 75 and above. Other risk factors such as duration of hospitalisation were also specified [34, 35]. Our study was conducted over a period of four months after hospitalisation. Only the part of the study covering the first month was discussed in this article.

There is no consensus in opinion regarding the best diagnostic indicators of patient mortality such as patient medical diagnosis or examinations of patient functional status [33]. The BI scale has been used more often to assess the ability of patients suffering from stroke to perform ADL, or in combination with other assessment tools, i.e., the Modified Rankin Scale, the Scandinavian Stroke Scale etc. [37]. Schepers and colleagues (2006) stated that the BI has been recommended for use by nurses to assess changes in physical functions during routine examinations of elderly people [38]. Quinn *et al.* (2011) indicated that, unlike the Rankin Scale, the BI does not have a specific value representing the likelihood of death [39], despite the fact that they have studied patients suffering from stroke. Schulc and colleagues (2015) applied the BI to examine the independence risk of patients aged 70 and over who lived at home [40]. In our study, the mean value of the BI was three-fold lower than that obtained in the study conducted by Martínez-Velilla, Cambra-Contin, and Ibáñez-Beroiz (2014) [41]. Serrano-Urrea, Gómez-Rubio, Palacios-Ceña *et al.* (2017) found, that the mean scores of Barthel Index decreases with aging [42]. In our study, the mean scores of the Barthel Index were also lower in older-age groups. Besides, the lower scores of the Barthel Index indicate a higher risk of dependence on others, the need for hospitalisation and a risk of falls [43]. An increased risk of falling and increasing mean scores of the

Barthel Index were demonstrated in our study, as well as in the study performed in Poland [43].

Modelling of hospitalisation-related risk could be helpful in making more substantiated decisions. Though it is common to develop new interventions, such as medicines or procedures, and risk and benefit models, the decisions related to patient hospitalisation or discharge for further treatment at home have usually been made irregularly [36]. We suppose that the critical value of the Barthel Index – 25 points – established in our study could only be applied for patients treated in nursing homes.

The implications for research and practice. This study is relevant for prognosis of treatment outcomes with the measuring cognitive and physical scales. We can assess the patients physical, cognitive functions and identify the needs of nursing using these instruments. According to this study, these questionnaires relate to the assessment of positive or negative nursing outcomes.

**Limitations of the study.** We are aware that our research may have three limitations that are associated with: (1) the research place, as the study was conducted only in a single hospital in Lithuania and thus, the results cannot be applied on a national level; (2) a small sample included in the study; and (3) the short study duration (one-month). Despite these limitations, we consider our study as potentially useful for both physicians and nurses when planning of treatment and nursing activities.

# 5 Conclusion

More than half of the patients participating in the survey had a severe or moderate cognitive impairment and were completely or almost completely dependent on other people and with a high risk of falling. The Morse Fall Scale was not suitable for the prognosis of patient discharge. This scale provides an indication of whether the risk of falling is present and the level of the risk. The Mini–Mental State Examination scale is suitable for a prognosis of patient discharge; however, the Barthel Index should be considered as the most suitable tool for a prognosis of treatment outcomes. A value on the Barthel Index above 25 can suggest that the patient will be discharged home. However, values below this level can be associated with a higher likelihood of patient death. This indicator could be useful both for physicians and nurses for everyday planning of treatment and nursing activities.

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