

# Systematic Review on the Functional Status of Elderly Hip Fracture Patients using Katz Index of Activity of Daily Living (Katz ADL) Score

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## ABSTRACT

Hip fractures cases are common in elderly population. After a hip fracture, around 80% of patients were unable to carry out at least one independent activity of daily living (ADL). This review attempted to provide an evidence-based literature on ADL of elderly hip fracture patients. A computerised literature search using Medline (OVID) and Scopus databases were conducted to identify relevant studies on ADL of elderly hip fracture patients that was assessed with Katz ADL score. Only articles that fulfilled the inclusion criteria were included in this review. Initial search identified 314 potentially relevant articles but after careful screening, only 5 full-text articles were selected for the present review. Three studies showed an increase dependent level of the patients' ADL after hip fractures. Two studies showed not more than half of the patients were unable to regain their pre-fracture ADL level after one year of hip fracture incidence. Feeding/eating showed the highest independent activity while bathing was the lowest independent activity among patients. In conclusion, elderly hip fracture patients have declined ADL with the risk that they may never regain their pre-fracture ADL level.

**Key words:** Hip fracture, functional status, Activity of daily living, Katz ADL

## INTRODUCTION

Activity of Daily Living (ADL) can be divided into simple or basic (BADL), and more complex, instrumental activity of daily living (IADL). BADL concerns functional mobility and personal care such as ambulation, transfer and bed mobility, toileting, feeding, hygiene, dressing and bathing. IADL involved complex activities such as shopping, cooking, housekeeping, laundry, use of transportation, managing money, managing medication and the use of the telephone. There are several assessment tools which can be used to assess ADL performance and functional status such as The PULSES Profile (PULSES), Katz Index of activity of Daily Living (Katz ADL), Kenny Self-Care Evaluation and The Barthel Index. Among these

tools, Katz ADL was the main tool used to measure and assess functional performance in patients<sup>1,2</sup>. It was developed to assess functional outcome in elderly by rating the subjects as dependent or independent of the six scales of basic activities which are bathing, dressing, toileting, transferring, continence and feeding (Figure 1)<sup>3</sup>. It is sensitive to detect declining health status but it has limited ability to measure small incremental changes during rehabilitation. Katz ADL was used extensively and consistently to evaluate functional status of elderly population<sup>4</sup>.

The outcomes of Katz ADL are dichotomous. A patient who could perform an activity without supervision, direction or assistance is scored "1 point (independence)". If a patient required supervision, direction or assistance to perform an activity, he or she is scored "0 point (dependent)". A patient who cannot perform an activity at all or require total care is also scored "0 point (dependent)"<sup>5</sup>. Reijneveld et al., (2007) showed that Katz ADL was a valid tool to measure functional outcome among elderly patients in the Turkish, Moroccan and Dutch population<sup>2</sup>.

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### Katz Index of Independence in Activities of Daily Living

<b>Activities</b> Points (1 or 0)	<b>Independence</b> (1 Point) NO supervision, direction or personal assistance	<b>Dependence</b> (0 Points) WITH supervision, direction, personal assistance or total care
BATHING  Points: _____	(1 POINT) Bathes self completely or needs help in bathing only a single part of the body such as the back, genital area or disabled extremity	(0 POINTS) Need help with bathing more than one part of the body, getting in or out of the tub or shower. Requires total bathing
DRESSING  Points: _____	(1 POINT) Get clothes from closets and drawers and puts on clothes and outer garments complete with fasteners. May have help tying shoes.	(0 POINTS) Needs help with dressing self or needs to be completely dressed.
TOILETING  Points: _____	(1 POINT) Goes to toilet, gets on and off, arranges clothes, cleans genital area without help.	(0 POINTS) Needs help transferring to the toilet, cleaning self or uses bedpan or commode.
TRANSFERRING  Points: _____	(1 POINT) Moves in and out of bed or chair unassisted. Mechanical transfer aids are acceptable	(0 POINTS) Needs help in moving from bed to chair or requires a complete transfer.
CONTINENCE  Points: _____	(1 POINT) Exercises complete self control over urination and defecation.	(0 POINTS) Is partially or totally incontinent of bowel or bladder
FEEDING  Points: _____	(1 POINT) Gets food from plate into mouth without help. Preparation of food may be done by another person.	(0 POINTS) Needs partial or total help with feeding or requires parenteral feeding.

**Figure 1:** Example of Katz ADL tools. Adapted from Wallace M, Shelkey M. Katz Index of Independence in Activities of Daily Living. *J Gerontol Nurs* 1999; 25: 8-9.

Hip fracture can be defined as a bone fracture that occurs at the proximal (upper) site of the femur, at the outer area where femoral head (ball) meets the acetabulum (socket) within the pelvis. Hip fracture can be generally classified into three major types based on anatomical sites: femoral neck, intertrochanteric and subtrochanteric fractures<sup>6,7</sup>. Hip fracture incidence is common especially in elderly women and is associated with significant mortality, morbidity and disability. Hip fracture can be treated either by surgical treatment or non-operative management.

Examples of surgical treatment for hip fracture are internal fixation, hemiarthroplasty or total hip replacement, extramedullary implants and intramedullary nail. If the patients have poor medical condition, not physically fit for an operation or too old, non-operative management is an alternative approach for the treatment of hip fracture<sup>8,9</sup>.

The total number of hip fracture cases in Asia has increased every year. In Japan, there were 851, 901 and 1059 cases reported in the year 2004, 2005 and 2006 respectively. In Korea, hip fracture cases in women have increased from 250.9 per 100 000

person in 2001 to 262.8 per 100 000 in 2004. Singapore was reported to have the highest incidence of hip fracture in Asia<sup>10</sup>. The last report on fracture cases in Malaysia was in 1997, which focused on cases in elderly of more than 50 years of age. The main type of fracture reported was hip fracture with the incidence of 90 per 100,000 individuals<sup>11</sup>.

Hip fracture is a major public health problem due to its increasing prevalence, health consequences and economics costs. It was estimated that after one year of fracture, around 25% to 75% of hip fracture patients who were independent before fracture were unable to walk independently and end up not achieving the pre-fracture level of independence.

Hip fracture was also associated with high co-morbidity, mortality rate and may cause permanent disability and dependency. It was shown that 18% to 33% of elderly hip fracture patient died after one year of hip fracture<sup>12,13,14</sup>.

This review attempted to provide an evidence-based literature on ADL of elderly hip fracture patients. Only Katz ADL was selected as the standard assessment tool for functional outcome of ADL.

## METHODOLOGY

### Searching Article

Computerized literature search of articles related to Katz ADL score of hip fracture patients was conducted using Medline (OVID) and SCOPUS databases. Several keywords were used and combined together. Below are the keywords used when searching for relevant articles:

1. Hip\* OR \*femur\* OR \*femoral\* OR acetabulum OR pelvi\* OR thighbone\* OR \*capsular\* OR \*trochanter\*
2. Activit\* of daily living OR \*ADL\*
3. Fracture\*
4. Katz\*

### 2. Selection of Research Articles

Article generated from both databases must fulfil both the inclusion and exclusion criteria of the present systematic review. All articles from the search database were limited to English language.

#### Inclusion Criteria:

Sample or subject must be more than 50 years of age, hip fracture patients and ADL assessed using Katz ADL score. In order to make comparison and analyses possible, only studies using Katz ADL score was chosen for this systematic review.

#### Exclusion Criteria:

Studies using subjects below 50 years of age, studies which were not related with the objective of this systematic review, intervention studies and review articles were all excluded.

### 3. Data Extraction and Management

All articles generated from Medline (OVID) and SCOPUS databases, underwent three phases of screening. Firstly, the titles of articles were screened and any articles with titles that did not match the inclusion criteria were excluded. In the second phase, abstracts of the remaining articles were screened. If they did not fulfil the inclusion criteria, the articles were excluded.

In the final stage of screening, the full text of the remaining articles was retrieved. The reviewers read thoroughly and reviewed all the articles to confirm their suitability and to ensure that they have met the inclusion and exclusion criteria.

Any reviews (narrative and systematic) or meta-analysis were excluded. Duplicates were removed throughout the screening phases. All the authors were involved in the screening phases. When there were differences in opinion, the authors would discuss to arrive to a consensus.

The screening phase was followed by the extraction phase, where all the data were extracted using a standardised data collection form. The following data was extracted:

1. Study design
2. Subject or sample population
3. Description of study method to measure ADL and duration of follow up
4. Description of the study result.

## RESULTS

### Search Result

Using the keywords mentioned above, 288 articles were retrieved from Medline OVID and 26 articles from SCOPUS databases. After the first screening, there were 26 articles left from Medline OVID and 10 articles from SCOPUS databases.

With the removal of the duplicates, there were 26 and 7 articles left from the Medline Ovid and SCOPUS databases, respectively. The abstracts of the 33 articles were independently screened by three reviewers.

Only 5 articles were left after excluding articles that did not fulfil the inclusion and exclusion criteria, reporting intervention study, or the parameters wanted did not form the main study. The full text of all 5 articles was successfully retrieved for further assessment and data extraction. All reviewers agreed that all the 5 articles should be included in the systematic review. Figure 2 showed the flow chart of study selection and search result.

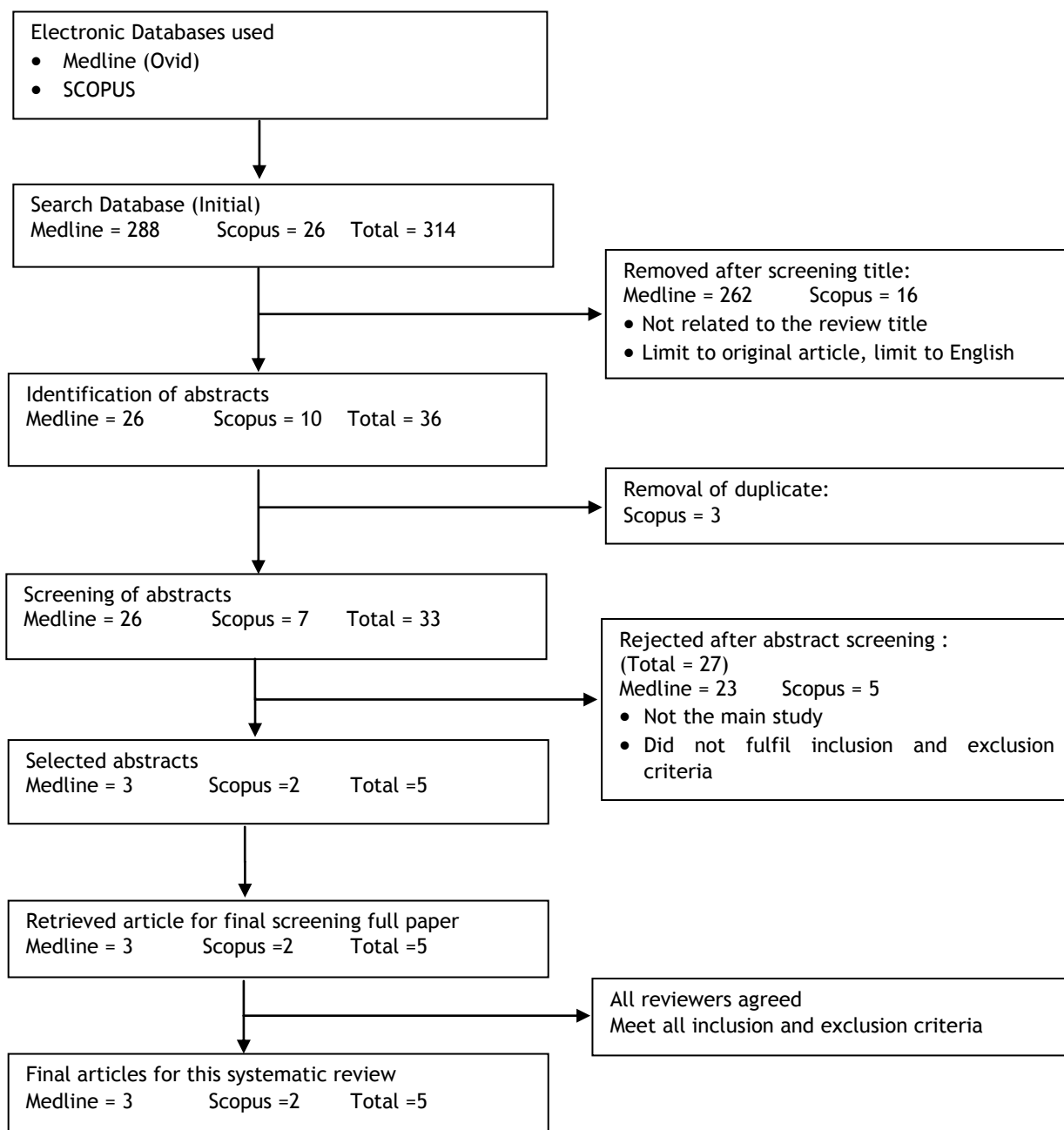


Figure 2: Flow chart of selection process for the article

### Characteristic of study

Characteristic of the studies included were summarized in Table 1. The designs of the selected studies were exploratory study by Curry et al.<sup>15</sup>, retrospective descriptive study by Garcia et al.<sup>16</sup>, prospective study by Svensson et al.<sup>17</sup>, prospective, longitudinal study by Wollinsky et al.<sup>18</sup> and prospective, consecutive study by Mehul et al.<sup>19</sup>. All the studies were published from 1996 to 2006. Two of the studies were published in 1996<sup>17,18</sup>. Another two were published in 2003<sup>15,19</sup> and one study was published in 2006<sup>16</sup>. Two studies have the sample size of less than 100 subjects<sup>15,16</sup>. Two studies have the sample size of more than 100 and up to 1000

subjects<sup>17,19</sup>. Only one study has the of sample size of more than 1000 subjects<sup>18</sup>. The age of the subjects for four of the studies were between 50 to 100 years old<sup>15,16,19</sup>. In another study all the samples were more than 70 years old<sup>18</sup>. Based on the gender, four articles focused on both gender, male and female<sup>16,17,18,19</sup>. Only one article focused on female subjects only<sup>15</sup>. One study followed up its subjects for six months to four years after fracture<sup>15</sup>. The rest of the studies followed up their subjects for 1 year<sup>16,17,19</sup> or 8 years after fracture<sup>18</sup>. Details of the study description were summarised in Table 2.

Table 1: Characteristic of Study

Study Characteristic	Number of study
<b>Study Design</b>	
Exploratory Design	1
Prospective study	3
Retrospective study	1
<b>Year of Publication</b>	
≤ 2000	2
>2000	3
<b>Sample Size</b>	
≤ 100	2
101-1000	2
> 1000	1
<b>Age Range</b>	
50 - ≤ 100	3
50 - ≥ 100	1
≥ 70	1
<b>Gender</b>	
Male and female	4
Female only	1
Male only	0
<b>Duration of Follow up</b>	
6 months to 4 years	1
>1 year	4

Table 2: Study Description

Title	Authors	Study Design	Year of publication	Sample or subject	Method of ADL assessment	Results
Functional status in older women following hip fracture	Curry et al., [15]	Exploratory Design	2003	Sample size: 23 Caucasian women  Age of subjects: 65 -95 years old.	Duration of follow up: 6 months to 4 years after fracture.  All subjects were interviewed.	18 out of 23 subjects achieved maximum independence score of the Katz ADL scale at least six month after fracture.  Eating was the activity that showed the highest independent level in 18 subjects. Bathing is the activity that needs the most help (5 subjects).  3 subjects need help in dressing and continence, 2 with toileting and 1 with transferring.  There is no significant difference between the ability to perform ADL at time of follow up with age, length of physical or rehabilitation therapy, number of pre-existing conditions and numbers of co morbidities after fracture.

### Katz ADL Score

Two studies from this systematic review had attempted to briefly describe each score scale and dependency status of the basic activity in Katz ADL that was used to assess hip fracture patients<sup>15,16</sup>. The other three studies did not describe the scale used in Katz ADL score<sup>17,18,19</sup>. Curry et al., (2003) showed that eating was the most independent activity among hip fracture patients, while bathing is the activity that required the most assistance<sup>15</sup>. Meanwhile, Garcia et al., (2006) reported improvement in the dependent level of ADL with physical ambulation showing the most improvement while feeding/eating showed the least improvement in dependency compared to other activities<sup>16</sup>. Three other studies<sup>16,17,18</sup> reported better independence level of ADL among hip fracture patients after the fracture. While, another two studies<sup>15,19</sup> reported that a proportion of hip fracture patients failed to regain their ADL pre-fracture level.

### Duration of follow up and ADL

Three studies reported that after one year of follow up, there were hip fracture patients who did not fully recover their basic ADL<sup>16,17,19</sup>. In fact, several of these patients had lower ADL compared to their pre-fracture level. Wolinsky et al., (1997) found that there was an increase in the mean of functional new limitation for ADL after six years of fracture as compared to baseline<sup>18</sup>. While, Curry et al., (2003) which followed up patients from six months to four years reported that 18 out of 23 patients had already achieved the maximum Katz ADL score (independence in all basic ADL) at six months after fracture<sup>15</sup>.

### Age, Gender and ADL

Curry et al., (2003) found no significant association between age and the ability to perform ADL. In this study, comparison cannot be made between different genders as the subjects recruited were only Caucasian women<sup>15</sup>. Svensson et al., (1996) also found no relation between ADL function and age or gender. However, the gender distribution in this study was not equal as the number of female patients (170 subjects) far exceeded the male patients (53 subjects)<sup>17</sup>. Wolinsky et al., (1997) had studied a large sample size and followed the subjects prospectively for 8 years. The focus of the study was to compare basic ADL of hip fracture subjects with control subjects. The results showed a significant difference in the mean score of ADL between the groups.

This indicated new functional limitations of ADL in the hip fracture subjects<sup>18</sup>. Garcia et al., (2006) showed that the decline in functional status was association with age (elderly more than 80 years) and male sex<sup>16</sup>. Mehul et al., (2001) reported that elderly hip fracture patients, aged more than 90 years old, were more likely to show reduction in their basic ADL<sup>19</sup>.

## DISCUSSION

There were only few studies available on the assessment of ADL for hip fracture patients. The focus of this systematic review was to analyse literatures on the ADL of elderly hip fracture patients. Elderly patients were selected as the incidence of hip fractures was high in patients more than 50 years of age<sup>20</sup>. There are several ADL scoring tools available, but this systematic review focused on the main type of tool used for functional assessment of hip fractures, which is Katz ADL. This tool is easy to use and is sensitive enough to give good assessment of ADL. Different tools have different aspect of evaluation and different scoring system. Thus, by standardizing the ADL assessment tool, it allowed comparison to be made between the studies on any changes in ADL. This systematic review was written based on five articles which fulfilled the selection criteria.

They were published from 1996 to 2006. Based on all the five article included in this review, the duration of follow up varied between six months to more than one years. The sample size for two of the studies were below 50 subjects<sup>15,16</sup>. Another 2 studies had over 200<sup>17</sup> and 800 subjects<sup>19</sup>. The largest sample size was recruited in the study by Wolinsky et al., (1997) which had more than 7500 subjects<sup>18</sup>. There is a huge difference in the sample size of the studies, from as few as 23 subjects to more than 7000 subjects. Since, there are limited studies carried out on the ADL of elderly hip fracture patients, all the studies were included. However, caution was taken when interpreting data from studies with smaller sample size. Greater consideration should be given more to studies with adequate and large sample size especially studies by Wollinsky et al., (1997) and Mehul et al., (2001)<sup>18,19</sup>. These studies have shown that significant proportion of elderly patients were unable to recover to their pre-fracture level of ADL.

Feeding or eating was shown to be the activity with the highest independent level, while, bathing has the lowest independent level among hip fracture patients<sup>15,16</sup>. These results were supported by Morris & Morris (1997), which described that bathing, was the first activity in ADL that was lost, while eating was the last to be retained after a hip fracture<sup>21</sup>. Heikkinen & Jalovaara (2005) had assessed functional outcome of hip fracture patients using questionnaire that contain only 4 basic ADL (bathing, dressing, feeding and toileting). It was shown that after four months of hip fracture, the 'bathing activity' of the patients did not improve and remain unchanged<sup>22</sup>. However, it was pointed out that different type and structure of bathing accommodations may influence the outcome of 'bathing activity' during the assessment of ADL<sup>15</sup>.

Three articles from this review, including the study with over 7000 subjects, showed that the level of

dependent was increased in hip fracture patients<sup>16,17,18</sup>. This finding was in agreement with the study by Dailiana et al., (2013) which reported that one year after a hip fracture, half of the patients failed to achieve full recovery of their ADL function<sup>23</sup>. Other studies using different tools to assess ADL also found that hip fracture was associated with increased dependence of ADL<sup>24</sup>. Based on the Standardised Audit Guideline Recommended for Europe (SAHFE) to evaluate functional ability and ADL, it was shown that 60% of patients require assistance to perform their ADL after a hip fracture<sup>25</sup>. In another study by Alarcon et al., (2011), hip fracture patient was followed-up for two years and their ADL assessed using Barthel Index. It was found that 78% of patients recovered their ADL after three months of hip fracture injury<sup>26</sup>.

This result supported the findings of the two articles included in this systematic review, which found that 60.8 % of patients achieved their basic pre-fracture ADL level after one year of hip fracture<sup>19</sup> and 78% were able to perform all Katz ADL independently after six month of fracture<sup>15</sup>. In contrast, Koval & Zuckerman (1994) reported that after one year of hip fracture, the elderly patients failed to recover their ability to perform either basic or instrumental ADL as before the fracture<sup>27</sup>. Boyd et al., (2008) studied the ability of elderly with hip fracture to recover their ADL after being discharged from the hospital. It was shown that at 1 year, only 30% of them have the ability to return back to their preadmission level of self-care ADL<sup>28</sup>. These findings were in agreement with the other three studies included this review which also found that elderly patients failed to fully recover their basic ADL at 1 year post-fracture<sup>16,17,19</sup>. Wollinsky et al., (1997) which followed up more than 7000 patients, showed that six years after a hip fracture, the patients had experience a significant increase in mean difficulties of basic ADL<sup>18</sup>. Curry et al., (2003) showed high percentage of independence in ADL with 18 out of 23 patients becoming independent at least six month after fracture. However, the samples size of the study was small and most subjects had lived independently before fracture, which may have contributed to the high rate of recoveries<sup>15</sup>.

There are several factors that may affect the functional recovery of hip fracture patients. One of the most important factors is the patient's age. The chances of full functional recovery declined with age. Other factors include chronic disease, acute cognitive deficit post-surgery, ability to walk before fracture, depression, living alone, prolonged hospitalization and living in nursing homes<sup>29</sup>. Study by Mehul et al., (2001) showed that the ADL recovery level was related to the patient's age. Relatively older patients were more dependent compared to younger patients. In the study, the number of patients aged 89 years or below was very high (774 patients) as compared to those aged more than 90 years old (76 patients). The huge difference in age category may influence the results which

showed that nearly 61% of the patients recovered to their pre-fracture ADL level<sup>19</sup>. Tinetti et al., (1999) had assessed ADL of elderly hip fracture patients using another type of assessment tool called Occupational Therapy Functional Assessment Compilation (OTFACT). They were able to show that the recovery rates of ADL among hip fracture patients within the year following fracture were around 25% to 50%<sup>30</sup>. This finding proved that old age is one of the risk factors for poor functional recovery after experiencing a hip fracture. Similar findings were reported by several other studies in elderly hip fracture patients using different ADL assessment tools. Infante-Catro et al., (2013) showed that age was an important predictor for functional recovery in elderly subjects<sup>31</sup>. Magaziner et al., (2003) also showed that aging contributed to disability in ADL among hip fracture patients after one year of the incident<sup>12</sup>.

As for the studies included in this systematic review, Wollinsky et al (1997) did not examine the relationship between the patient's age and ADL status, but just compared the ADL level between hip fracture patients and control subjects<sup>18</sup>. Two other studies showed no association between age and ADL status<sup>15,17</sup> while, another two studies showed an association between ADL with age<sup>16,19</sup>. There was a decline in functional status of patients above 80 years old<sup>16</sup> and patients above 90 years old were more likely to have lower ADL score<sup>19</sup>.

As for the gender differences, four studies in this systematic review included both male and female subjects<sup>16,17,18,19</sup>. However, only the study by Garcia et al., (2006)<sup>16</sup> had managed to compare the ADL score of both sexes while the other three study did not make any attempt to compare them<sup>17,18,19</sup>. It was shown that male sex was associated with the decline in functional status<sup>16</sup>. The result differed from a previous study by Endo et al., (2005) which showed no significant gender difference in ADL score among hip fracture patients<sup>32</sup>. Hawkes et al., (2006) also concluded that the functional recovery status after fracture for men was probably the same to women<sup>33</sup>. Furthermore, Samuelson et al., (2009) also showed no association between gender and ADL status<sup>34</sup>.

## CONCLUSION

Elderly patients with hip fracture had experienced a decline in ADL with a significant proportion of the patients failed to recover their pre-fracture ADL functional status. There is still not enough evidence to conclude whether age and gender would have any significant affect on ADL status. More studies on ADL status on hip fracture are required.

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Title	Authors	Study Design	Year of publication	Sample or subject	Method of ADL assessment	Results
Evolution of Brazilian elderly with hip fracture secondary to a fall	Garcia et al., [16]	Retrospective Descriptive Study	2006	Sample size: 34 patients Sex: 29 men and 5 women.  Age of subjects: 60 to 100 years old.	Duration of follow up: 1 year after fracture  Patients were contacted via email or telephone and, home visits. All subjects were interviewed. Relative or caregivers were interviewed if subjects have cognitive impairment.	<b>ADL Before fracture:</b>  30% of samples were dependent in the activity of bathing, 18% in dressing and toileting, 12% in physical ambulation, 36% in urinary/faecal continence and 9% in feeding. The most dependent basic daily living activity was urinary/faecal continence.  <b>ADL one year after fracture:</b>  The level of dependent on the basic daily living activity for each items were bathing 55%, dressing and toileting 48%, physical ambulation 45%, urinary/faecal continence 68% and feeding 26%  At 1 year post-fracture, men had lower ability to perform basic daily activity than women.
Prediction of the outcome after hip fracture in elderly patients	Svensson et al., [17]	Prospective study	1996	Sample size: 232 patients Sex: 179 women and 53 men.  Age of subjects: 65 to 96 years old.	Duration of follow up: 1 year after fracture  ADL function assessed at the time of preinjury and one year after fracture. ADL function was graded as Good or Dependant. Good ADL meant that patients were at least able to dress and undress independently.	<b>ADL before fracture:</b> 205 patients (88%) were in Good ADL function while 27 patients (12%) were Dependent in ADL function.  <b>ADL at one year after fracture:</b> After one year, 81% were good in ADL function and 33% were Dependent in ADL function.



<p>The effect of hip fracture on mortality, hospitalization, and functional status: A prospective study</p>	<p>Wollinsky et al., [18]</p>	<p>Prospective longitudinal study</p>	<p>1997</p>	<p>Sample size: 7527 subjects; hip fracture patients (368) and control subjects (7159).</p> <p>Age of subjects :70 years old or more</p> <p>Assessment at baseline and 8 years follow up.</p> <p>At 8-years follow-up: left with 4138 subjects ; 108 hip fracture patients and 4030 controls</p>	<p>Duration of follow up: Baseline and followed up prospectively up to 8 years.</p> <p>Patients were interviewed for ADL assessment.</p>	<p><b>ADL at Baseline:</b></p> <p>Hip fracture patients and control subjects have mean difficulties in Basic ADL of 0.78 and 0.68, respectively.</p> <p><b>ADL at the time of follow up:</b></p> <p>Mean difficulties in Basic ADL for hip fracture patients and control subjects were 2.07 and 0.79 respectively. The significant increase of mean difficulties in Basic ADL indicated new functional limitations for elderly hip fracture patients.</p>
<p>Outcome after hip fracture in individuals ninety years of age and older</p>	<p>Mehul et al., [19]</p>	<p>Prospective, Consecutive</p>	<p>2001</p>	<p>Sample size: 850 Sex: 616 female and 158 male.</p> <p>Age: 65 to 105 years of age.</p> <p>At 1 year follow up, only 602 patients left</p>	<p>Duration of follow up: 1 year after fracture.</p> <p>Patients' pre- fracture ADL were assessed and then followed up one year after fracture. Patients, family members or caregivers were interviewed during admission. Follow up was carried out by telephone interview.</p>	<p><b>ADL before fracture:</b></p> <p>92 patients aged 65 to 89 years old (11.9%) were dependent in at least one Basic ADL. 23 patients, aged more than 90 years old (30.3%) were dependent on at least one basic ADL. 682 patients (88.1%)<sub>2</sub> aged 65 to 89 years old and 53 patients (69.7%) aged more than 90 years old were dependent in all basic ADL.</p> <p>Patients more than 90 years old were more dependent in basic ADL.</p> <p><b>ADL one year after fracture:</b></p> <p>480 (60.8%) patients recovered to their pre-fracture level of independence in Basic ADL. Patients more than 90 years old showed more deterioration in basic ADL compared to patients aged between 65 to 89 years old.</p>

**CONFLICT OF INTEREST**

The authors reported no conflicts of interest.

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