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Abstract: Objectives. To evaluate health-related quality of life (HRQoL) and depression in older patients with pressure ulcers who were living at home in the community. Methods. A cross-sectional analytical study conducted in southern Minas Gerais, Brazil. Forty-two outpatients 60 years and older, showing no cognitive deficit who were living in the community, participated in the study. They were divided into two groups: the study group (21 patients with pressure ulcers), and control group (21 patients without pressure ulcers). The instruments Mini-Mental State Examination (MMSE), Medical Outcomes Study 36-Item Short Form Health Survey questionnaire (SF-36), and 15-item Geriatric Depression Scale (GDS-15) were used, respectively, to identify cognitive impairment, and assess HRQoL and depression. Results. Among the 36 pressure ulcers detected on examination, Stage II ulcers were the most common finding (50%), and the sacral region was the most common location (44.5%). Patients with pressure ulcers had significantly lower HRQoL scores than controls in all SF-36 domains, with the lowest scores being reported for physical functioning, role physical and role emotional (P < 0.0001). Seventeen (80.9%) of the patients in the study group were identified as having depression (P = 0.002). Conclusion. A high rate of depression (GDS-15) was found in elderly patients with pressure ulcers, who also reported lower HRQoL scores in all SF-36 domains compared with controls.

Pressure ulcers are defined as skin and soft-tissue lesions, which may be superficial or deep, of ischemic etiology, secondary to an increase in external pressure, and usually located over a bony prominence.1 Pressure ulcers are a major cause of decrease in quality of life, aggravating and interfering with the treatment of other health problems, thus increasing suffering, morbidity, as well as nursing care time and care costs.2 The situation is worse among the elderly population because 71% of the pressure ulcers occur in patients 70 years or older.3,4 The quality of life of patients with pressure ulcers is related to factors such as pain, suffering, costs to the healthcare system and the family, and limitations in performing activities of daily living.5,6
Currently, there is a growing research and clinical interest in developing robust quantitative measures of quality of life that can be used in clinical assessments and economic models. Assessment of quality of life has played an important role in the development of health services.7,8

Depression is the most prevalent psychiatric disorder in the elderly that may significantly affect the quality of life of this population.9 Although common, the identification of depressive symptoms in the elderly is often difficult in clinical practice.10 Epidemiological studies have indicated prevalence rates of depression ranging from 1% to 16% among elderly outpatients living in the community, and even higher rates for those with comorbidities.11

It is commonly observed that depressed elderly patients are more likely to have worse general health along with a significant decrease in their quality of life.12,13 The increase in the elderly population makes it necessary to investigate the characteristics of pressure ulcers, whose presence adversely affects social interaction and body image, decreases both quality of life and self-esteem, causes pain and discomfort, and has a significant economic impact due to significantly high treatment costs.14,15

**Methods**

This was a cross-sectional analytical study with 42 outpatients 60 years and older, who showed no significant cognitive deficit, who were living at home in the community and received care at health centers located in southern Minas Gerais, Brazil, from July 2005 to March 2006. The sample was divided into two groups: the study group, consisting of 21 patients with pressure ulcers, and the control group, consisting of 21 patients without pressure ulcers. All patients were assessed by home interview, which was previously scheduled.

The Mini-Mental State Examination (MMSE) was administered by interview to identify patients with cognitive impairment.16,17 Nine patients with cognitive impairment (who were rated below the cutting-point) were excluded from the study.

Pressure ulcers were assessed by macroscopic examination and classified based on the degree of tissue damage into four stages ranging from Stage I (nonblanchable erythema of intact skin) to Stage IV (full-thickness skin loss with extensive destruction, tissue necrosis, or damage to muscle, bone, or supporting structures), according to the National Pressure Ulcer Advisory Panel (NPUAP);18 the number of pressure ulcers and their anatomical location were also recorded.

HRQoL was assessed by the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36) questionnaire.7 The SF-36 is a generic questionnaire containing one comparative item assessing changes in health over the past year, and 35 items grouped into 8 domains (physical functioning, role physical, bodily pain, general health, vitality, social functioning, the emotional role, and mental health) assessing the patient’s perception of health over the last 4 weeks. Scores on each dimension range from 0 to 100, with 0 corresponding to the worst health status and 100 to the best health status. Each domain is evaluated and analyzed separately.7

The 15-item Geriatric Depression Scale (GDS-15) was used to assess depression.19 The cut-off point used to identify a possible case of depression was 6 and over, with scores of 5 and less corresponding to “no depression”; 6 to 10 “light depression”; 10 and more “severe depression.”

For the statistical analysis, the Pearson chi-squared test was used to compare the frequency distribution of categorical variables (educational level, income, comorbidities, and number of medicines used by patients) between groups. The Mann-Whitney test was used for comparisons between groups of SF-36, GDS-15, and MMSE scores, age, and body mass index (BMI). The Spearman correlation coefficient was calculated to evaluate possible correlations between the different variables.20

All statistical tests were performed at a significance level \( P \leq 0.05 \).

The Research Ethics Committee of the Sapucaí Valley University (UNIVÁS) Brazil, approved the study. Written informed consent was obtained from all patients.

**Results**

Of the 42 elderly patients who agreed to participate in the study, 39 were living in urban areas and three in the countryside; all of them were retired.

Both the study and control groups were homogeneous in terms of age \( (P = 0.246) \), educational level \( (P = 0.086) \), number of comorbidities \( (P = 0.112) \), income \( (P = 0.467) \), and BMI \( (P = 0.715) \).

A total of 36 pressure ulcers were found in 21 patients of the study group; nine (42.9%) of the patients had more than one ulcer. Stage II ulcers were the most common finding (50%), and the sacral region was the most common location (44.5%). Arterial hypertension was the most common comorbid condition in both the control
The major causes of immobility and pressure ulcer formation were cerebral vascular accidents (31.3%) and proximal femoral fractures (23.8%). The mean age for the study group was 76.5 years, and for the control group was 79.4 years. The patients in both study and control groups were predominantly white, female, widow(er), and Catholic.

Patients with pressure ulcers had significantly lower HRQoL scores than controls in all SF-36 domains, with the lowest scores being reported for physical functioning, physical role, and emotional role ($P < 0.0001$ [Table 1]).

An important finding was that some SF-36 domains had a high floor effect among patients in the study group; while among patients in the control group they had a high ceiling effect (Table 2).

The floor effect indicates the percentage of patients with the lowest possible domain score (0, worst possible health status), and the ceiling effect indicates the percentage of patients with the highest possible domain score (100, best possible health status).

When comparing the current health status with that of a year ago, 15 (71.4%) of the patients in the study group chose the score categories “slightly worse” or “much worse,” while 8 (38%) of the patients in the control group chose these categories. This evaluation usually is not included in the statistical analysis of the SF-36 scores because no numerical values are attributed to the responses.

A high rate of depression was detected by the GDS-15 in the studied population. Seventeen (80.9%) of the patients in the study group were identified as having depression, while in the control group, 6 (19.1%) patients suffered from depression (Figure 1).

In the study group, statistically significant correlations between GDS-15 and SF-36 scores were found in the general health ($r = -0.73, r^2 = 0.53, P = 0.0002$), mental health ($r = -0.57, r^2 = 0.32, P = 0.0069$), and vitality ($r = -0.57, r^2 = 0.32, P = 0.0063$) domains using the Spearman correlation coefficient.

The analysis of the correlation of GDS-15 scores with pressure ulcer staging and number of pressure ulcers per patient showed that there was no direct relation

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**Table 1.** Mann-Whitney test results comparing scores of the eight SF-36 domains for the study group (patients with pressure ulcers) and control group (patients without pressure ulcers).

<table>
<thead>
<tr>
<th>SF-36 domains</th>
<th>Floor effect</th>
<th>Ceiling effect</th>
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<tbody>
<tr>
<td></td>
<td>S (n (%))</td>
<td>C (n (%))</td>
</tr>
<tr>
<td>Physical functioning</td>
<td>15 (71)</td>
<td>18 (86)</td>
</tr>
<tr>
<td>Physical role</td>
<td>4 (19)</td>
<td>3 (14)</td>
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<tr>
<td>Bodily pain</td>
<td>1 (4)</td>
<td>1 (4)</td>
</tr>
<tr>
<td>General health</td>
<td>2 (9)</td>
<td>-</td>
</tr>
<tr>
<td>Vitality</td>
<td>16 (76)</td>
<td>1 (4)</td>
</tr>
<tr>
<td>Social functioning</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Emotional role</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mental health</td>
<td>-</td>
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</tbody>
</table>

S: study group
C: control group

*Statistically significant

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**Table 2.** Number (percentage) of patients in the study and control groups who achieved the lowest possible score (floor effect) and highest possible score (ceiling effect) on the 8 SF-36 domains.

<table>
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(66.6%) and study (71.4%) groups. The major causes of immobility and pressure ulcer formation were cerebral vascular accidents (31.3%) and proximal femoral fractures (23.8%). The mean age for the study group was 76.5 years, and for the control group was 79.4 years. The patients in both study and control groups were predominantly white, female, widow(er), and Catholic.
between degree of depression and both the number of pressure ulcers per patient and lesion severity, since in our study the patient with the largest number of pressure ulcers (5 ulcers) scored 7 (light depression) on the GDS-15, and the patient with the most severe tissue damage (two Stage IV ulcers) did not score for depression. Two patients with a Stage II ulcer had the highest depression scores (scores of 12 and 13, corresponding to severe depression). Five (23.8%) patients in the study group and three (14.3%) patients in the control group, who were receiving antidepressants, were classified as depressed on the GDS-15.

Discussion

There was some difficulty in selecting elderly patients with pressure ulcers who had no cognitive deficits and were cared for by family members at home; unfortunately, there are no estimates available in Brazil for this specific population.

Many of the elderly with pressure ulcers had cognitive deficits, which result in reduced sensory perception and pressure ulcer development, hence, they were excluded from the study.

In medicine, the evaluation of quality of life was motivated by the increase in longevity—as life expectancy increases, people are concerned not only about living longer, but also with his or her quality of life.22-25

The sample had the following sociodemographic and clinical characteristics: low income, low educational level and use of various medications to treat comorbidities, with arterial hypertension, sequelae of cerebral vascular accidents, osteoarticular diseases and diabetes mellitus being the most common comorbidities. These characteristics are in agreement with those found in other studies on elderly patients with pressure ulcers.19,24-26

The “Health, Well-Being and Ageing Project,” which was conducted in the city of São Paulo to promote family care for the elderly, revealed that most of the elderly live with their family, emphasizing the role of the family in providing care to these patients.27

Often the caregivers are elderly and their ability to provide care may be limited. Women, particularly wives and daughters, are generally the family caregivers.28 In the present study, wives and daughters comprised 90.5% of caregivers.

Previous studies have shown that ill and bedridden elderly patients living at home maintain their physical and cognitive functions when they are properly cared for.27

With regard to the location and classification of pressure ulcers, our results were similar to those found in the literature.24-26,28,29

All patients in the study group had activity limitations, and 20 (95.3%) had limited mobility and were exposed to excessive moisture.

Seventeen (80.9%) of the patients developed pressure ulcers during hospitalization; 9 (52.9%) of these patients developed pressure ulcers while in the admission unit, and 8 (47.1%) while in an intensive care unit. Only 4 (19.1%) of the patients developed pressure ulcers while at home.

Epidemiological studies on the prevalence of pressure ulcers in Brazil have shown high prevalence rates during
Pressure ulcers are a common complication in elderly patients who were recently discharged from a hospital following a period of immobility.

The HRQoL of the elderly does not depend only on the presence or absence of diseases. A HRQoL evaluation based on objective parameters devised by a researcher may not be the correct one; assessing the HRQoL of the elderly requires the use of parameters that account for the subjectivity of individual perception of patients.

The only study found in the literature reporting the use of the SF-36 to assess HRQoL in patients with pressure ulcers used a sample of patients 18 years or older. Patients with and without pressure ulcers had similar SF-36 scores, with the lowest scores being reported for vitality (study group) and mental health (control group).

In a study on practical and methodological issues concerning the use of the SF-36 in elderly patients, it was reported that the floor effect was found mostly among the oldest, most impaired and seriously ill patients. The ceiling effect was found mostly in the general population, which aligns with our results.

Another study reported that physical functioning and role physical were the SF-36 domains that had the highest floor effect (41% and 31%, respectively), in our study, these domains had a floor effect of 71% and 86%, respectively. The difference in the results between the studies is probably due to the fact that the sample in the present study consisted exclusively of elderly patients with a higher level of functional impairment.

Our results revealed that the general health domain did not have a floor effect in neither the study groups nor the control group, which is in accordance with the previously mentioned study. It is important to note that this domain is more related to the disease that led to the development of pressure ulcers than the ulcer itself.

In the present study, it was confirmed that physical functioning and role physical, which are related to the evaluation of physical aspects, are the SF-36 domains that better distinguish groups with different levels of chronic diseases. Mental health and emotional role, which are related to the evaluation of mental state, are the SF-36 domains that better distinguish psychiatric conditions, including depression. Social functioning, vitality, and general health are the SF-36 domains used in the evaluation of mental and physical aspects, and therefore require a more complex interpretation.

One problem with the use of the SF-36 in elderly patients is the poor level of questionnaire completion. Missing data are known to be higher with the use of self-administered questionnaires especially in elderly patients with health problems like those included in our sample; in such cases, interview administration is recommended. Previous studies using the GDS-15 concluded that interview administration was the most effective mode of administration of this measure, and GDS-15 is not recommended for elderly patients with cognitive deficit.

Low educational level is a determining factor in the quality of the information obtained from self-administered questionnaires, with interview administration being the most appropriate mode for these patients.

In the present study, there were no missing data, even among the oldest patients with physical and functional impairment. This may be explained by the fact that the SF-36 was administered as an interview at each patient’s home. Our findings differ from those from a previous study in which the SF-36 was self-administered by the elderly patients who were unable to complete it due to visual disorders, reading difficulties, and lack of familiarity with responding to questionnaires. Another factor that may explain the absence of missing data is the exclusion of patients with a cognitive deficit.

The severity of depression symptoms and chronic diseases are predictors of lack of improvement on many aspects of quality of life, indicating that these factors always have to be considered in the evaluation of the patient’s prognosis.

Depression has been under-recognized in elderly patients with health problems. Late-life depression is mostly caused by factors that affect relevant existential values such as life threatening diseases, death or severe illness in the family, retirement, environmental changes, significant material loss, dramatic life events, and conflicts that affect the emotional state of patients, and by the fact that most of these factors are intrinsically irreversible.

Studies in the literature that used rating scales like the one used in this study for depression in elderly patients with pressure ulcers could not be found; the depression experienced by patients with pressure ulcers has been only addressed qualitatively.

In the study group, a high level of depression was associated with a high level of functional dependence and functional impairment. In the control group, the cases of depression were not directly related to functioning but instead to losses in life and decline in health status.

Patients with depressive symptoms tend to report lower physical role scores, and lower social and physical
functioning scores than patients without these symp-
toms.36 Mental health was the strongest predictor of
depressive symptoms among the SF-36 components.
Patients with clinical depression had significantly lower
scores ($P < 0.001$) on all SF-36 domains compared with
the general population (adjusted for age, sex, and race),
particularly on those domains more sensitive to the men-
tal health component such as mental health, emotional
role, and social functioning domains.34

Mental health and GDS-15 scores were compared
using Spearman's correlation coefficient since mental
health is the SF-36 domain that better reflects depressive
symptoms. However, there was a weak correlation
between these variables ($r = -0.57, r^2 = 0.32$) despite the
high level of depression detected by the GDS-15. This
result shows the importance of using both generic and
specific instruments for the assessment of specific dis-
cases, populations, or functions.43

O'Brien et al44 emphasize that the best alternative for
the treatment of patients with pressure ulcers at home
should involve a responsible support team and engaged
family members. They also found that it is more socially
and financially acceptable.44

Evaluation of HRQoL in elderly patients is a hard task
because of the degree of difficulty in discriminating
between the influence of the condition and that of
comorbidities on the outcomes. We observed that it was
not possible to focus only on the influence of the lesion
itself, and that associated conditions also had to be
considered.45

Frailty is regarded as a state resulting from a multi-sys-
tem reduction in reserve capacity, which is determined
by the combined effects of biological aging, comorbid-
ities, and sedentary lifestyle; it renders the elderly vulner-
able and more susceptible to diseases and development
of disabilities.46 Due to this borderline condition, elderly
patients develop masked and atypical disease presenta-
tions, which makes diagnosis and prognosis difficult.
Pressure ulcers are often the “tip-of-the-iceberg” phe-
nomenon where the clinically visible portion is only a
small part of the whole picture.

Conclusion

A high rate of depression (GDS-15) was found in eld-
early outpatients with pressure ulcers living at home in
the community. These patients also reported lower
HRQoL scores compared to controls in all SF-36
domains. The quality of life of elderly patients with pres-
ture ulcers is related to factors such as functional
dependence and loss of autonomy, costs to the health-
care system and to the family, and subjectivity of individ-
ual perception.

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