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FEATURE ARTICLE

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Occupational balance and stroke impact among community-dwelling stroke survivors 65 years or older: a cross-sectional study

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Abstract

Introduction: Occupational balance has been investigated in different populations but less in stroke survivors. Previous studies have focussed on occupational balance among stroke survivors of working age (15–64 years of age), showing they did not perceive they had occupational balance. There is, therefore, a lack of knowledge of how older stroke survivors perceive their occupational balance. The aims of this study were to describe occupational balance in community-dwelling stroke survivors 65 years or older and to investigate if there were any associations between their perceived stroke impact and occupational balance.

Methods: A cross-sectional study was performed with 58 stroke survivors, with a median age of 75 years at stroke onset and a median time since stroke onset of 11 months. The participants were recruited from a local stroke register and answered questionnaires on occupational balance and stroke impact. Data were analysed with descriptive statistics, correlations and logistic regression.

Results: The participants had a median score of 29 (min 12 to max 33), indicating a very high occupational balance, a low stroke impact, and a good recovery (median 82.5; min 0 to max 100). An association between participation and occupational balance (OR 1.13; 95% CI 1.04–1.23) was found.

Conclusion: The stroke survivors perceived a low stroke impact and a high occupational balance. It is possible that older community-dwelling stroke survivors, of whom many have retired, juggle less occupations leaving them with more time to engage in those occupations they want to, leading to a better occupational balance.

PLAIN LANGUAGE SUMMARY

People who have a stroke can experience difficulties with managing everyday activities, including performance of a specific task but also to have a balance between activities that are needed and those that are enjoyed. Previous studies have showed that stroke survivors in working age did not perceive they had a

balance in their daily activities, but similar studies in older stroke survivors were lacking. This study therefore described balance in daily activities in 58 community-dwelling stroke survivors 65 years or older. The participants answered questionnaires on balance in daily activities and what impact the stroke had in their life. The results showed that they had a very high balance in daily activities and a low stroke impact and perceived a good stroke recovery. Our conclusion is that because many of the older community-dwelling stroke survivors are retired, they therefore have more time to spend on activities they want to engage in. Since they can decide themselves how their time will be spent, this can explain why they experience a better balance in daily activities. Future studies should include a larger number of participants. Still, we believe that since this is a new research area, the results are interesting for researchers and clinicians in this field.

KEYWORDS
activities of daily living, aged, occupational balance, occupations, post-stroke

1 | INTRODUCTION

Despite recent medical advancements (Campbell & Khatri, 2020), a stroke can have a profound impact on the life situation of the individual, physically, psychologically as well as socially (Langhorne et al., 2011). Acute stroke rehabilitation is mainly focussing on restoring function, such as improving walking and recovery of upper and lower limb movement (Hasan et al., 2021). These are services that stroke survivors in general are satisfied with (Oyanagi et al., 2021). Yet, previous studies have described that it is common for stroke survivors to experience a decreased ability to participate in meaningful occupations (Adamit et al., 2015; Eriksson et al., 2006; Gustafsson & Bootle, 2013), suggesting this has not been the foci during the acute rehabilitation period. Such problems often become apparent when stroke survivors are being discharged from hospital, commonly directly from the stroke unit to their own homes after only a short length of stay in the hospital (RiksStroke, 2020). For many, this is a transitional process when stroke survivors experience mixed expectations such as insecurity and fear about the future (Nordin et al., 2015). Returning home to their previous everyday life often means stroke survivors need to adapt their occupations according to their new situation, and yet, they struggle to perceive a balance between their everyday occupations (Kimmel et al., 2022; Toglia et al., 2019). Everyday life after stroke is therefore perceived as a process where people try to create control, obtain occupational balance, and be socially included (Lund et al., 2013).

Key Points for Occupational Therapy

- Community-dwelling stroke survivors ≥65 years perceive a low stroke impact and a high occupational balance.
- A high level of participation can explain 64% of participants' occupational balance.
- Older community-dwelling stroke survivors who no longer work juggle less occupations and may therefore have more time to spend on other occupations, leading to higher occupational balance.

A previous cross-sectional study with a general population (Wagman & Håkansson, 2014a) showed that there was a relationship between occupational balance and subjective health, suggesting that it is important for all individuals to experience a balance between the different occupations in everyday life. This has also been confirmed in another cross-sectional study including adults with and without inflammatory arthritis (To-Miles et al., 2022). Thus, if health professionals want to offer interventions that target health and well-being, evaluations of balance in everyday occupations—occupational balance—should be included. Occupational balance has been described as the individual's subjective experience of having the right amount of, and the right variation between occupations in their occupational pattern—the

occupations engaged in during a day, week, or year (Wagman et al., 2012). Experiencing a satisfying occupational pattern is a prerequisite for occupational balance. Occupational balance is also dynamic, and influenced by the individual's abilities and resources, as well as the environment. Despite being a concept described in previous studies (Håkansson et al., 2021; Håkansson & Lexén, 2021; Magnusson et al., 2021; To-Miles et al., 2022; Uthede et al., 2022), to our knowledge, only two studies have explored occupational balance in individuals with stroke. Both studies (Kassberg et al., 2021; Nyman et al., 2021) come from the north of Sweden and describe occupational balance with individuals with an acquired brain injury (ABI), including mostly people with stroke and a few with traumatic brain injury. The first study (Kassberg et al., 2021) showed there was an association between occupational balance and life satisfaction among 63 working-age participants with ABI. The second study (Nyman et al., 2021), partly performed with the same sample as the first study, showed that the majority of the participants did not perceive they had occupational balance. However, neither of the studies explored if occupational balance was associated with stroke subtype, family situation, and perceived impact of stroke. In addition, the focus for these studies (Kassberg et al., 2021; Nyman et al., 2021) was stroke survivors of working age, that is, people between the ages of 18 and 64, and there is therefore a lack of knowledge of how other age groups within community-dwelling stroke survivors perceive their occupational balance. Thus, the aims of the present study were to describe occupational balance in community-dwelling stroke survivors who were 65 years or older and to investigate if there were any associations between their perceived impact of stroke and occupational balance.

2 | MATERIALS AND METHODS

2.1 | Ethics statement

The study was approved by the Swedish Ethical Review Authority (Dnr 2020/02064). All individuals gave their written informed consent prior to participation, and they were informed they could withdraw from the study at any point in time without any consequences for future healthcare. The study was performed in accordance with medical research involving human subjects as described in the 1996 Helsinki Declaration, consistent with the World Health Organisation's guidance for ethics review of health-related research with human participants from 2011.

2.2 | Positionality statement

Araceli Ortiz-Rubio is a registered occupational therapist, PhD. She is working as an associate professor at Granada University in Spain. She has been working together with the other authors on different papers regarding occupational balance and has been in Sweden on two occasions during a research exchange. Carita Håkansson is a registered occupational therapist, PhD, and associate professor. She is working at Lund University in Sweden. She is one of the original authors who developed the occupational balance questionnaire and has been doing research in this area for several years. Hélène Pessah Rasmussen is an MD, PhD, and associate professor. She is currently working as a rehabilitation physician at Skåne University Hospital in Lund and Malmö. She has extensive clinical as well as research experience in people with stroke. Eva Månsson Lexell is a registered occupational therapist, PhD, and associate professor. She is currently holding a position as senior lecturer at Lund University where she is head of a research group mainly focussing on research in relation to occupational therapy and rehabilitation interventions. She also has long clinical experience of working with people with different neurological conditions.

2.3 | Study design

This study has a cross-sectional design, and the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) (von Elm et al., 2007) was followed.

2.4 | Participants and recruitment

The current study is part of a larger project, studying occupational balance in people with different neurological disorders. In this part of the project, stroke participants were recruited among 566 individuals who had sustained a stroke between December 2020 and April 2021 from a local part of RiksStroke, a national stroke register in Sweden. Of the 566 individuals, 129 were deceased, leaving 437 potential participants. In the present study, the following inclusion criteria were established: community-dwelling adults 65 years or older, 6–12 months since the most recent stroke. Exclusion criteria include individuals whose medical condition resulted in being discharged to a residential care facility. From the 437 individuals, 126 had been discharged to a residential care facility and were therefore excluded. The

remaining 311 individuals were sent an invitation letter with information about the study. From these, 234 (75%) did not answer the invitation, and 77 individuals (25%) sent in their informed consent and answered the survey. Further, 19 participants were excluded since nine were younger than 65 years of age, and 10 of the individuals' surveys to a large extent were incomplete (e.g. only half of the questions in one of the tools were answered, or the questions in one of the tools were left blank). There were no significant differences between those who chose to participate and those who did not, during the acute care, regarding age, sex, type of stroke, type of residence, mobility, toileting, dressing and help with activities of daily living (ADL)/instrumental activities of daily living (IADL). Similarly, at the 3-month follow-up, no significant differences were found between those who participated or not, with respect to their ability to return to normal life and perform activities as before. All these measures were obtained from the register.

2.5 | Data collection tools and procedure

All potential participants received a postal letter containing information about the study together with an informed consent form and a return envelope. Those who sent in a signed consent form received a second postal letter containing the survey. The survey comprised a form with socio-demographic questions, the stroke impact scale, the occupational balance questionnaire, and another return envelope.

Socio-demographic data included age, sex, stroke type, time since stroke, civil status, living situation, type of residence, and if the participant was working or not.

Occupational balance was assessed with the Occupational Balance Questionnaire (OBQ11) (Håkansson et al., 2020). The OBQ11 has 11 items with four response alternatives from *completely disagree* (0) to *completely agree* (3). The instrument allows the results to be presented as a summarised total score (scale 0–33) and/or analysed separately for each item (Håkansson et al., 2020). Both were used in the present study. A higher rating indicates a higher occupational balance. The OBQ11 has good content validity, and sufficient test–retest reliability (Wagman & Håkansson, 2014b), good internal consistency, and good construct validity (Håkansson et al., 2020).

Perceived impact of stroke was assessed with the Stroke Impact Scale (SIS), a patient-reported outcome measure (Duncan et al., 2003). The current version of the Stroke Impact Scale (SIS version 3.0) comprises 59 items, covering eight domains/subscales: strength (four items), hand function (five items), mobility (nine items), ADL/IADL (10 items), memory (seven items), communication (seven items), emotion (nine items), and participation (eight items). The responses to each question in the eight domains are scored on a Likert scale of 1–5 (1 = *large stroke impact* to 5 = *less stroke impact*). Aggregated scores are generated, and the higher the score (0–100) the less impact (fewer problems in everyday life) is perceived. The SIS also includes one item, presented in the form of a visual analogue scale (VAS), that assesses overall stroke recovery, ranging from 0, *no recovery*, to 100, *full recovery* (Duncan et al., 2003; Lai et al., 2002).

2.6 | Data analysis

Data were statistically analysed using the Statistical Package for Social Sciences software, version 29.0. Categorical data are presented with descriptive statistics (numbers and percentages; medians and interquartile ranges). Continuous data are presented in numbers and percentages.

The OBQ11 response alternatives generates ordinal data. Thus, Spearman's correlations or chi-squared test were used to decrease the number of candidate variables for logistic regression analysis (Sperandei, 2014). Based on the literature (Kleinbaum et al., 1998), variables that exceeded $r = 0.39$ in correlations were considered candidates for logistic regression analyses. Four variables were not considered in the model. 'Time since stroke' and 'age' were not included due to a small range, and 'work situation' and 'stroke type' were not included because very few participants were still working or had a haemorrhagic stroke.

For 'living situation', 'gender', and 'civil status', no significant correlations were found between these variables and occupational balance. Thus, none of these variables were included in the model. When we performed correlations between the eight variables in the SIS and occupational balance, four variables—'memory', 'communication', 'emotion', and 'hand function'—were not significant (<0.39) and were therefore not included in the model.

There is no estimated cut-off value for the OBQ11. Occupational balance total score was therefore dichotomised into low occupational balance (0 = 12–29) versus high occupational balance (1 = 30–33), according to the sample's median (29), an approach that has been used previously (Kassberg et al., 2021; Uthede et al., 2022; Wagman et al., 2021). To examine the predictive values of the SIS domains associated with occupational balance, a binary logistic regression analysis was performed. Five independent variables were included in our regression model, which, according to Ranganathan et al., (2017), is

an acceptable number to use when about 60 participants are included. These variables were tested for collinearity (tolerance, variance inflation factor) to avoid standard error inflation for the regression model.

3 | RESULTS

3.1 | Participants

A total of 58 stroke survivors were included in this study. Their median age at stroke onset was 75 years, and 21% were older than 80 years of age. Fifty-nine per cent of the participants were men, and more than 95% of the participants were retired. In Table 1, the characteristics of the participants are presented.

3.2 | Participants' occupational balance

For all items, the majority of the participants answered that they 'agree' or 'strongly agree', and they had a median of 29 of the total score (min 12 to max 33). The highest number of occupational balance was found for item 5 'have sufficient time for doing obligatory occupations' ($n = 56$; 98%) and for item 6 'balance between physical, social, mental and restful occupations' ($n = 52$; 91%). The ratings of the 11 items of the OBQ11 are shown in Table 2.

3.3 | Participants' stroke impact

The SIS subscales with the highest means were 'communication', 'ADL/IADL', 'hand function', and 'memory', and the lowest means were in 'emotion', 'mobility', 'physical problems', 'stroke recovery', and 'participation'. High variability was found for several of the subscales. In Table 3, the results from the SIS are presented.

TABLE 1 Characteristics of the 58 participants.

Age, *median (Q1–Q3) years*	75 (71–79)
Gender, *n (%) men*	34 (59%)
Stroke type, *n (%) ischaemic*	55 (95%)
Time since stroke, *median (Q1–Q3) months*	11 (9–12)
Civil status, *n (%) married*	39 (67%)
Living situation, *n (%) living with another person*	44 (76%)
Type of residence, *n (%)*	
Terrace house	30 (52%)
Apartment	27 (47%)
Both	1 (2%)
Work situation, *n (%)*	
Working	3 (5%)
Not working	55 (95%)

3.4 | Associations between stroke impact and occupational balance

The results showed an association between participation and occupational balance (OR 1.13; 95% CI 1.04–1.23). Participants with high participation had 13% higher possibility to perceive high occupational balance than participants with low participation. See Table 4.

4 | DISCUSSION

The aim of this study was to describe occupational balance in Swedish community-dwelling stroke survivors 65 years or older and to investigate if there were any associations between their perceived stroke impact and occupational balance. The results indicated that the stroke survivors perceived a high occupational balance and only little stroke impact for all items in the SIS scale. Furthermore, the regression analysis showed that the most important outcomes with respect to occupational balance were ADL/IADL and participation.

One of the most important features in the present study was that the stroke survivors perceived a very high occupational balance compared to previous studies performed with participants of different ages with no known neurological disorder(s), who described median scores from 11 to 18 (Håkansson et al., 2021; Håkansson & Lexén, 2021; Magnusson et al., 2021; To-Miles et al., 2022; Uthede et al., 2022). Further, the stroke survivors in the present study had also a very high occupational balance compared to the median of 19 reported in the previous Swedish studies who described occupational balance in individuals with ABI in working age, mainly people with stroke (Kassberg et al., 2021; Nyman et al., 2021).

Although the total score, as well as several individual items, differed compared to those reported by Kassberg et al. (2021) and Nyman et al. (2021), both studies and the participants in the current study rated item 6 high ('balance between physical, social, mental and restful occupations'). Yet, the participants in the present study also rated item 5 ('have sufficient time for doing obligatory occupations') high. In fact, 98% rated this item as 'strongly agree' or 'agree'. One explanation can be that the participant group was older (≥65 years) than those included in the previous Swedish studies (Kassberg

TABLE 2 The ratings of the 11 items of the OBQ11 for all 58 participants.

	Strongly disagree *n* (%)	Disagree *n* (%)	Agree *n* (%)	Strongly agree *n* (%)
1. Having sufficient to do during a regular week	0 (0)	7 (12)	13 (22)	38 (66)
2. Balance between doing things for others/oneself	0 (0)	6 (10)	20 (35)	32 (55)
3. Time for doing things wanted	0 (0)	11 (19)	14 (24)	33 (57)
4. Balance between work, home, family, leisure, rest, and sleep[a]	1 (2)	7 (12)	13 (23)	36 (63)
5. Have sufficient time for doing obligatory occupations[a]	0 (0)	1 (2)	12 (21)	44 (77)
6. Balance between physical, social, mental, and restful occupations[a]	0 (0)	5 (9)	16 (28)	36 (63)
7. Satisfaction with how time is spent in everyday life[a]	2 (3)	5 (9)	21 (37)	29 (51)
8. Satisfaction with the number of activities during a regular week[b]	1 (2)	4 (7)	22 (39)	29 (52)
9. Balance between obligatory/voluntary occupations[b]	3 (5)	5 (9)	19 (34)	29 (52)
10. Balance between energy giving/energy talking activities[b]	1 (2)	6 (11)	16 (28)	33 (59)
11. Satisfaction with time spent in rest recovery and sleep[b]	2 (4)	3 (5)	22 (39)	29 (52)

[a]$n = 57$.
[b]$n = 56$.

TABLE 3 Stroke Impact Scale 3.0 (SIS) subscales/domains for all 58 participants.

Subscales	Median	Mean (SD)
Strength[a]	81 (31–100)	81.14 (19.42)
Memory	89 (17–100)	84.11 (19.24)
Emotion	75 (44–100)	73.08 (14.69)
Communication	96 (50–100)	90.15 (12.32)
ADL/IADL	92 (40–100)	89.48 (11.88)
Mobility	77 (33–100)	73.52 (13.34)
Hand function[b]	95 (30–100)	85.70 (18.21)
Participation[b]	84 (18–100)	79.22 (21.93)
Stroke recovery	82 (70–95)	78.29 (22.39)

[a]$n = 56$.
[b]$n = 57$.

et al., 2021; Nyman et al., 2021), who focussed on stroke survivors of working age. It is possible that adults who are not working may feel less pressured to manage many occupations at the same time. Having retired, working tasks are no longer part of their occupational pattern, and there is more time to plan and engage in other occupations. This is in line with previous research (Hovbrandt et al., 2019) showing that those that continue to work after retirement age in Sweden (≥65 years) change their occupational pattern to achieve a better balance among occupations. Another explanation to the high occupational balance scores may be that after the stroke, the participants have re-evaluated their lives and decreased their expectations in life. Many stroke survivors learn to live with the consequences that the stroke may have imposed in their lives (Norlander et al., 2018). At the same time, Wang et al. (2014) have shown that in people below 65, good health is associated with being able to return to work. Thus, stroke survivors of working age can feel a pressure to pursue work tasks as before the stroke. In the present study, the participants' mean age was 75 years of age, and 21% of the participants were 80 years or older. Thus, this sample is not likely to experience the same pressure to work and may suggest that different age groups experience their occupational balance differently. Future studies should include larger sample sizes that enable subgroup analyses.

The participants had a lower stroke impact and a higher perception of stroke recovery in comparison with previous studies (Eriksson et al., 2013; Guidetti et al., 2014). These studies included large sample sizes (116 and 204 participants, respectively) and possibly with a larger variety of stroke severity than the participants in the present study. Further, Eriksson et al. (2013) included younger participants (mean 62.4 years). These

TABLE 4 Associations between stroke impact and occupational balance.

	Unstandardized coefficients			95% CI for β		
Coefficients	**B**	**SE**	**Standardised coefficients (OR)**	**Lower**	**Upper**	***P*-value**
Strength	−0.035	0.033	0.966	0.906	1.030	0.292
ADL/IADL	0.158	0.083	1.171	0.995	1.379	0.058
Mobility	0.018	0.057	1.018	0.911	1.137	0.757
Participation	0.122	0.044	1.130	1.035	1.232	0.006
Stroke recovery	−0.002	0.024	0.998	0.953	1.045	0.927

Note: Nagelkerke R square for the total model was 0.640.

participants were recruited between 2002 and 2007, and it is possible that the medical advancements (Campbell & Khatri, 2020), together with the new action plan for stroke in Europe (Norrving et al., 2018), have had a positive influence on the participants' stroke impact. Similar, they had higher scores in several SIS subscales/domains—strength, memory, communication, ADL/IADL, hand function, participation, and stroke recovery. These results contradict those presented by previous studies (Eriksson et al., 2013; Guidetti et al., 2014) where hand function and strength subscales/domains were found to be the most affected at 1-year post-stroke. Still, having used different assessment tools, groups are to some extent difficult to compare.

It is not surprising that there was a significant association between participation and occupational balance. All occupations in everyday life are organised into occupational patterns that change during different time periods in life (Persson et al., 2001; Townsend & Polatajko, 2013). Previous research has also established the relationship between occupational balance and patterns of daily activities (Eklund et al., 2017). For occupational therapists working with clients with stroke, our study shows that focussing interventions on function will not increase their occupational balance. Instead, helping clients participate in meaningful occupations will increase their chance of experiencing occupational balance.

In summary, the participants perceived a low stroke impact, good stroke recovery, and a high occupational balance. This implies they may also perceive a good ability to participate in meaningful occupations, in contrast to the results from previous studies (Eriksson et al., 2006; Gustafsson & Bootle, 2013.;). Taken together, these studies highlight the importance of describing occupational patterns and occupational balance in occupations community-dwelling stroke survivors have and want to undertake in their everyday life. The OBQ11 can therefore be a useful tool in stroke rehabilitation, especially for community-dwelling stroke survivors, where occupational balance can be important to address.

4.1 | Study Limitations

Looking at the high SIS scores, one could argue that the participants were a subsample of highly functioning stroke survivors. Indeed, they were selected from a register, and stroke survivors who did not live in their own homes were excluded. Future studies of occupational balance in people living in residential care facilities would be interesting. Another limitation is the small sample size. Only around 25% of invited participants sent in their informed consent and filled in the survey. The difficulty to recruit stroke participants within stroke research is well known (Boxall et al., 2016; Carlstedt et al., 2022; Polese et al., 2017). Future studies of occupational balance in people with stroke should aim to recruit larger samples sizes. Despite the small sample size, there is hardly any research in this area. We therefore believe that our study is of interest to occupational therapists.

4.2 | Implications for Practice

Stroke rehabilitation and occupational therapy interventions often focus on stroke survivors' restoration of impairments and ability to manage ADL and IADL. Based on the results from this study, therapists need to facilitate aspects of participation and broaden their practice to also address issues of occupational balance among their clients. More importantly, therapists need to be aware that clients have different needs and that some may not at all experience a low occupational balance.

5 | CONCLUSION

In conclusion, the results show that community-dwelling stroke survivors who were 65 years or older perceive a low stroke impact and a high occupational balance. In addition, we found an association between participation and occupational balance. It is possible that older stroke survivors, of whom many have retired, juggle less

occupations during a day and week and thereby have more time to engage in those occupations they want to, leading to a high occupational balance. This is, to the best of our knowledge, the first study that has specifically addressed occupational balance in a group of community-dwelling stroke survivors, 65 years or older. Future studies should include larger sample sizes and focus on those over 65 years of age who experience higher stroke impact.

AUTHOR CONTRIBUTIONS

Design and conceptualization, A.O., C.H., H.P-R., E.M.L.; methodology, A.O., C.H., E.M.L. writing—review and editing, A.O., C.H., H.P-R., E.M.L. All authors have read and agreed to the published version of the manuscript.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest to declare.

DATA AVAILABILITY STATEMENT

The data used in this study contains sensitive information about the study participants and they did not provide consent for public data sharing. The current approval by the Swedish Ethical Review Authority does not include data sharing. A minimal data set could be shared by request from a qualified academic investigator for the sole purpose of replicating the present study, provided the data transfer is in agreement with EU legislation on the general data protection regulation and approval by the Swedish Ethical Review Authority. Contact information: Eva Månsson Lexell, e-mail: eva.mansson_lexell@med.lu.se.

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